The Roman Peasant Project

2009–2014

Excavating the Roman Rural Poor

Volume 1

Edited by Kim Bowes

The Roman Peasant Project 2009–2014

Excavating the Roman Rural Poor

University Museum Monograph 154

The Roman Peasant Project 2009–2014

Excavating the Roman Rural Poor

Volume 1

Edited by
Kim Bowes

University of Pennsylvania Museum of Archaeology and Anthropology | Philadelphia

Publication of this book was aided by a grant from
the von Bothmer Publication Fund of
the Archaeological Institute of America.

LIBRARY OF CONGRESS CATALOGING-IN-PUBLICATION DATA

Names: Bowes, Kimberly Diane, 1970- editor, author. | University of Pennsylvania. Museum of Archaeology and Anthropology, issuing body.
Title: The Roman Peasant Project 2009-2014 : excavating the Roman rural poor / edited by Kim Bowes.
Description: First edition. | Philadelphia : University of Pennsylvania, Museum of Archaeology and Anthropology, 2020- | Series: University museum monograph ; 154 | Includes bibliographical references. |
Identifiers: LCCN 2020020421 | ISBN 9781949057072 (hardcover) | ISBN 9781949057089 (ebook)
Subjects: LCSH: Peasants--Rome. | Land tenure--Rome--History. | Rome--Rural conditions. | Rome--Antiquities. | Roman Peasant Project--History. | Tuscany (Italy)--Antiquities. | Tuscany (Italy)--Rural conditions. | Excavations (Archaeology)--Italy--Tuscany.
Classification: LCC DG55.E87 R66 2020 | DDC 305.5/6330937--dc23
LC record available at https://lccn.loc.gov/2020020421

© 2020 by the University of Pennsylvania Museum of Archaeology and Anthropology
Philadelphia, PA
All rights reserved. Published 2020

Distributed for the University of Pennsylvania Museum of Archaeology and Anthropology
by the University of Pennsylvania Press.

Printed in the United States of America on acid-free paper.

Contents

VOLUME 1

Author List xii
Acknowledgments and Dedication xiii
Ceramic References and Abbreviations xv
List of Figures xvii
List of Tables xxvii

Part I: Old Questions and New Data

1 Introduction: Inventing Roman Peasants (KB) 1
1.1 Peasants: Definitions 3
1.2 Historiography I: Roman Peasant History and the Ancient Swerve 4
1.3 Historiography II: Archaeology and the Peasant Swerve 11
1.4 Project Questions and Hypotheses 13
1.5 Volume Outline 17

2 Methodologies (AA, KB, SCE, CG, MG, MM, JM, AMM, MS, EV) 19
2.1 Precepts (KB) 20
2.2 Archeology in Roman Social History (KB) 22
2.3 Methodologies 22
2.3.1 Field Survey (MG) 23
2.3.2 Site Selection (KB) 25
2.3.3 Geophysics (MG) 25
2.3.4 Excavation (KB, MS) 26
2.3.5 Ceramics Analysis (EV) 27
2.3.6 Faunal Analysis (MM) 28
2.3.7 Land Analysis (AA) 29
2.3.8 Movement (AA, CG) 31
2.3.9 Geological Materials (AA) 32
2.3.10 Botanical Analysis (AMM) 32
2.3.11 Small Finds Analysis (SCE) 34
2.4 Quantification (KB) 35

3	Land and Locale (AA, KB, CG, MG, ER)	37
3.1	Locale (KB, CG)	39
3.2	Land (AA)	40
3.3	Vegetation (ER)	49
3.4	Human Activity in a "Liminal" Landscape (KB)	53
3.5	Human Activity in the *Commune* of Cinigiano (KB, MG)	54
3.6	Characteristics of the Locale (AA, KB, MG)	60
3.7	Conclusions (KB)	61

Excavations

4	Pievina	63
4.1	Situation (AA, MG)	63
4.2	Remote Sensing (MG)	63
4.3	Excavation (KB)	65
4.4	Chronology (EV)	73
4.5	Ceramics (EV)	75
4.6	Faunal Materials (MM)	84
4.7	Geological Considerations, Land Units, and Evaluation (AA)	87
4.8	Botanical Materials	89
4.9	Coins (FM)	89
4.10	Small Finds (SCE)	95
4.11	Glass (SCE, ERR)	98
4.12	Building Materials (AA)	100
4.13	Discussion (KB)	101
5	Case Nuove	107
5.1	Situation (AA, CG, EV)	107
5.2	Remote Sensing (MG)	107
5.3	Excavation (KB)	109
5.4	Residue Analysis (AP, MACO)	117
5.5	Discussion of Excavation Results (KB)	119
5.6	Chronology (EV)	120
5.7	Ceramics (EV)	122
5.8	Faunal Materials (MM)	133
5.9	Botanical Materials (AMM, ER, RR)	137
5.10	Geological Considerations, Land Evaluation/Use, and Mobility (AA, CG, AM)	144
5.11	Coin Finds (FM)	153
5.12	Small Finds (SCE)	153
5.13	Glass (SCE, ERR)	157

5.14	Building Materials (AA)	158
5.15	Discussion (KB)	158
6	San Martino	163
6.1	Situation (AA, MG)	163
6.2	Remote Sensing (MG)	163
6.3	Excavation (KB)	163
6.4	Chronology (EV)	165
6.5	Ceramics (EV)	168
6.6	Faunal Materials (MM)	172
6.7	Land Units and Evaluation (AA)	173
6.8	Botanical Materials (AMM, ER, RR)	173
6.9	Coins/Small Finds (SCE)	179
6.10	Building Materials (AA)	179
6.11	Discussion (KB)	181
7	Poggio dell'Amore	185
7.1	Situation (AA, MG)	185
7.2	Remote Sensing (MG)	185
7.3	Excavation (KB)	185
7.4	Chronology (EV)	190
7.5	Ceramics (EV)	190
7.6	Faunal Materials (MM)	194
7.7	Geological Features, Land Units, and Land Evaluation (AA)	194
7.8	Botanical materials (AMM, ER, RR)	195
7.9	Coins/Small Finds (SCE)	201
7.10	Glass (SCE, ERR)	201
7.11	Building materials (AA)	201
7.12	Discussion (KB)	204
8	Colle Massari	207
8.1	Situation (AA, MG)	207
8.2	Remote Sensing (MG)	207
8.3	Excavation (KB)	209
8.4	Chronology (EV)	212
8.5	Ceramics (EV)	212
8.6	Faunal Materials (MM)	212
8.7	Botanical Materials (AAM, ER, RR)	213
8.8	Hydrological/Geological Contexts, Land Units, and Land Evaluation (AA)	217
8.9	Small Finds (SCE)	219
8.10	Building Materials (AA)	219
8.11	Discussion (KB)	219

9 Podere Terrato 221
9.1 Situation (AA, MG) 221
9.2 Remote Sensing (MG) 221
9.3 Excavation (KB) 221
9.4 Chronology (EV) 225
9.5 Ceramics (EV) 227
9.6 Faunal Materials (MM) 230
9.7 Hydrological/Geological Contexts, Land Units, and Land Evaluation (AA) 234
9.8 Botanical Materials (AAM, ER, RR) 236
9.9 Coins/Small Finds (SCE) 242
9.10 Glass (SCE, ERR) 246
9.11 Building Materials (AA) 246
9.12 Discussion (KB) 247
10 Marzuolo 249
10.1 Situation (AA, MG) 249
10.2 Remote Sensing (MG) 249
10.3 Excavation (KB, EV) 253
10.3.1 Area I 253
10.3.2 Area II 276
10.3.3 Area III 279
10.4 Ceramics (EV, KB) 289
10.5 Faunal Materials (MM) 304
10.6 Hydrological/Geological Contexts, Land Units, and Land Evaluation (AA) 314
10.7 Botanical (AMM, ER, RR) 317
10.8 Coins (SCE) 336
10.9 Small Finds (SCE) 338
10.10 Glass (SCE, ERR) 349
10.11 Building Materials (AA) 354
10.12 Discussion (KB) 356
11 Tombarelle 361
11.1 Situation (AA, MP) 361
11.2 Remote Sensing (MG) 361
11.3 Excavation (KB) 362
11.3.1 Area I: Phase 1? and 4 362
11.3.2 Area II: Phase 1 364
11.3.3 Area III: Phase 3 367
11.3.4 Area IV: Phase 2 375
11.4 Chronology (EV) 376
11.5 Ceramics (EV) 384

11.5.1 Phase 1 (Area II) 384
11.5.2 Phase 2 (Area IV) 394
11.5.3 Phase 3 (Area III) 395
11.5.4 Phase 4 (Area I) 411
11.6 Faunal Materials (MM) 411
11.7 Hydrological/Geological Contexts, Land Units, and Land Evaluation (AA) 417
11.8 Botanical Materials (AAM, AF, ER, RR) 420
11.9 Coins/Small Finds (SCE) 427
11.10 Building Materials (AA) 428
11.11 Discussion (KB) 430

VOLUME 2

Part II: A New Synthesis

12 Where Did Roman Peasants Live? Habitation and Distributed Habitation (KB, SCE, CG) 435
12.1 Definitions: House and Households (KB, CG) 435
12.2 Peasant Houses and Households in Roman Central Italy (KB) 436
12.3 The Spaces and Activities of the Roman Peasant Project (KB) 443
12.4 Parsing the "Domestic" (KB) 449
12.5 Correspondence Analysis (SCE) 450
12.6 Distributed Habitation and the Temporal Spectrum (KB) 462
12.7 Distributed Habitation in Context (KB, CG) 465
12.8 Implications for the Roman Agrarian Landscape (KB) 461
13 Agriculture and Land Use (AA, KB, MM, AMM, ER, RR) 471
13.1 Land Suitability in the Project Area (AA) 472
13.2 Land Use in the Project Area (AMM, ER) 475
13.3 Plant Accumulation and Transport (AMM, RR) 483
13.4 Land Use versus Land Suitability (AA, AMM) 484
13.5 Land Use, Distributed Habitation, and Intensified Agriculture (KB) 486
13.6 Crop rotation: Evidence and Implications (AAM, KB) 492
13.7 Pasture, Mixed Farming and Its Implications (KB) 496
13.8 Animal Husbandry Strategies (MM) 498
13.9 Conclusions: An "Extensive-Intensive" Agricultural System (KB) 514
14 Diet, Dining, and Subsistence (KB, MM, AMM, ER, RR, EV) 517
14.1 Dietary Staples: : Grain, Legumes, Fruits, and the Missing Vegetables (AMM, ER, RR) 519
14.2 Meat in the Peasant Diet (MM) 521
14.3 Cooking and Diet (MM, EV, KB) 527
14.4 Dining and Diet (KB, EV) 533

14.5 Subsistence, Surplus, and Storage (KB) 536
14.6 Conclusions (KB) 540
15 Non-Agricultural Production, Markets, and Trade (KB, EV, SCE, CG) 543
15.1 Money (SCE) 544
15.2 Production and Consumption inside the Locale (KB, EV) 548
15.2.1 Origins of Goods: Imports and the Local 549
15.2.2 Production and Consumption inside the Locale 557
15.2.3 Production for the Locale and for Export: The Case of Marzuolo 558
15.3 Geographies of Exchange (CG) 561
15.4 Conclusions (KB) 565
16 Architecture and Recycling (KB) 567
16.1 Materials and Form 568
16.2 Recycling 575
16.3 Negative Space: Installations and Yards 580
16.4 Permanence and Friability 583
16.5 Conclusions 584
17 Mobility (CG, AA) 587
17.1 Landscapes and Movement 588
17.2 Evidence for Mobility 590
17.3 Landscapes, Ancient and Modern 595
17.4 Establishing Parameters for Movement 596
17.5 Scales of Movement 602
17.5.1 Occasional Mobility 603
17.5.2 Episodic Mobility 607
17.5.3 Quotidian Mobility 610
17.6 Conclusions: Meaning and Familiarity, Time and Place 611
18 Conclusions: The Roman Peasant Reframed (KB, CG) 617
18.1 Landscapes 617
18.2 Demographics 619
18.3 Agriculture and Productivity 620
18.4 Labor 622
18.5 Land Tenure and Power 624
18.6 City, Country, and Peasants 626
18.7 Wealth and Poverty 629
18.8 Peasants in Time and History 633
18.9 Extendability 637
18.10 Future 638

19 Appendices 641
19.1 Community Projects with the Commune of Cinigiano (MC, MG, KB) 641
19.2 Ceramics Classes, All Sites (EV) 643
19.2a Ceramics Classes, All Sites (EV) 643
19.2b Ceramics Form/Function, All Sites (EV) 644
19.3 Faunal Materials 648
19.3a NISP Relative Frequencies for Consumed Taxa, All Sites (MM) 649
19.3b Minimum Number of Individuals (=MNI) by Taxon, Age Category, and Site, All Sites (MM) 650
19.3c Cattle – Relative Frequency by Skeletal Part Category, Calculated on the Basis of NISP and MNE, All Sites (MM) 651
19.3d Sheep/Goat – Relative Frequency by Skeletal Part Category, Calculated on the Basis of NISP and MNE, All Sites (MM) 652
19.3e Pig – Relative Frequency by Skeletal Part Category, Calculated on the Basis of NISP and MNE, All Sites (MM) 653
19.3f Relative Frequency of UNID Counts by Site, All Sites (MM) 654
19.4 Pollen - Composite Pollen Table, All Sites/Phases in Chronological Order (AMM/ER) 656
19.5 Coins - Catalogue of Coins (SCE) 668
19.6 Small Finds 676
19.6a Catalogue of Small Finds (SCE) 676
19.6b Small Find Counts by Site (SCE) 692
19.6c Iron Nail Dimensions (SCE) 694
19.6d Copper Nail Dimensions (SCE) 712
Bibliography 715

Author List

AA: Antonia Arnoldus†
KB: Kim Bowes
MC: Marianna Cirillo
SCE: Stephen Collins-Elliott
AF: Assunta Florenzano
MG: Mariaelena Ghisleni
CG: Cam Grey
MM: Michael MacKinnon
FM: Flavia Marani
JM: James Matheiu
AMM: Anna Maria Mercuri
PN: Paolo Nanini/Soprintendenze Archeologia Belle Arti e Paesaggio (SABAP) della Toscana.
MACO: Miguel Ángel Cau Ontiveros
AP: Alessandra Pecci
ER: Eleonora Rattighieri
RR: Rossella Rinaldi
ERZ: Elisa Rizzo
ERR: Elisa Rubegni
MS: Marco Sfacteria
EV: Emanuele Vaccaro

All unattributed photographs are product of the Roman Peasant Project collectively.

Acknowledgments and Dedication

This work was substantially and generously supported by the National Science Foundation (Grant Number BCS – 1063447). The project was also supported by the 1984 Foundation, the Loeb Classical Foundation who also supported its publication, the POGO Family Foundation, the University of Pennsylvania Museum of Archaeology and Anthropology (Penn Museum), the Einaudi Center for International Studies at Cornell University, an Affinito-Stewart Grant and a Midas-Croesus grant from Cornell University, and the Fondazione Montecucco. The project would not have been possible without their financial support and we are deeply grateful to them all.

The University of Pennsylvania and Cornell University sustained our research and we are grateful for their institutional support. We are likewise grateful to the Soprintendenza per i Beni Culturali della Toscana/ Soprintendenza Archeologia, Belle Arti e Paesaggio, under whose kind permission the project took place.

Charles K. Williams is especially acknowledged here, not only for his support but also his suggestions drawn from his own extensive fieldwork, which helped make sense of some crucial and particularly puzzling issues. Peter Gould likewise provided support as well as advice on our community projects and pitched in at Colle Massari Romano.

Emanuele Vaccaro's contribution was funded by the European Community's Seventh Framework Programme (0FP7/2007–2013) (grant number 236093), carried out at the McDonald Institute for Archaeological Research (University of Cambridge). Organic residue analysis and ceramic thin sections were funded by the McDonald Institute for Archaeological Research and the Faculty of Classics (University of Cambridge). The residue analysis was carried out as part of the project PROFOLANT, European Community's Seventh Framework Programme (PIEF-GA-2009-235863) and LRCWMED (ref. HAR2009-08290, subprograma HIST), funded by the Ministerio de Ciencia e Innovación, Subdirección General de Proyectos de Investigación, with the contribution of FEDER funds, the support of ERAAUB (SGR 2009-1173), and the Comissionat per a Universitats i Recerca del DIUE of the Generalitat de Catalunya.

Stephen Collins-Elliott's post-fieldwork documentation and photography of the small finds was supported by a University of Tennessee Professional Development Award. He would like to thank Prof. John Mitchell for his guidance and advice on getting started on the small finds while he worked on the project as a graduate student (2010–2014), as well as Cara Cugley Coggan for her work with finds organization and documentation.

Thanks to mayor Romina Sani and her staff at the *commune* of Cinigiano, who helped make the project possible. Also in Cinigiano, Katja Meier helped us with various community projects, including visits by children and women at risk, public presentations of the project's work, and site visits for town members.

For permission to excavate on their land, we thank Stavros Tsoukas, the Machetti family, Roberto and Sandro Monaci, Enzo Tassi and the other families who trusted us with their fields. We especially thank Dott. Claudio Tipa of the Società Colle Massari and Dott. Guerrini dell'Azienda Colle Massari.

From the Soprintendenza per i Beni Culturali della Toscana/Soprintendenza Archeologia, Belle Arti e Paesaggio special thanks to Dott.ssa Maria Angela Turchetti, as well as Dott. Luigi Tondo and the personnel of the Grosseto museum.

Paolo Nannini selflessly devoted his time each year to aerial photographs via boom, kite, and balloon. His entrepreneurial and innovative spirit was a model to us all.

Steve Ellis and John Wallrodt very kindly provided comparative data from the University of Cincinnati's

Pompeii Porta Stabia Project. The fact we could not make use of it as we intended does not diminish their collaborative example, which is likewise a model to us all.

Elisa Rizzo and Marco Sfacteria not only ran the later seasons recording systems, but dedicated hours to the completion of final illustrations, including those left unfinished by the death of our colleague Antonia Arnoldus.

Jim Mathieu, Rhodora Vennarucci, and Astrid Van Oyen are honorary authors on the Marzuolo and mobility chapters: Jim selflessly dedicated two weeks to assisting on the mobility study at risk to his sanity, and Astrid and Dora's exemplary work at Marzuolo has since translated into their own project there. Kevin Uhalde and Jackie Maxwell also both pitched in at Marzuolo at a critical time.

Likewise, the work of Marianna Cirillo, Stefano Ricchi and Giulia Lazzeri runs through the whole of the first section, and without their assistance, in general and in particular on the ceramics at Marzuolo, the fieldwork would not have been possible. Sarah Leppard and Simon Greenslade excavated San Martino with admirable car, while Tom Collie and Sabrina Salmon lead the teams at Marzolo 2013 and Tombarelle.

Stefano Campana, Sandro Sebastiani, Carlo Citter, and Giovanna Bianchi all provided much needed equipment and logistical support, and just as importantly their ideas and advice.

Chris Dyer, Chris Evans, Susan Oosthuizen, Gunter Schörner, Ian Hodder, and especially Richard Hodges helped us interpret various aspects of the final results, drawing on their own long experience with peasant populations. Audiences at the American Academy in Rome, the Royal Netherlands Institute in Rome, the Universities of Harvard, Pennsylvania, Chicago, Stanford, and Cornell provided much-needed interpretive and theoretical advice as the project was being written up. The work and long-term mentorship of Peter Brown, Peter Garnsey, Richard Hodges, and Riccardo Francovich(†) runs through many aspects of this project and inspired its beginnings.

We are so grateful to Page Selinsky at the Penn Museum, who edited and prepared these volumes with such care, working throughout the COVID-19 pandemic and all its challenges to see this project through to completion.

Finally, we want to thank all the students from the US, Italy, England, the Czech Republic, Belgium and elsewhere who lent their backs and minds to illuminating the lives of Roman peasants. They did the backbreaking and often boring work that produced the results we describe here. No fear.

Dedication

This volume is dedicated to Antonia Arnoldus-Huyzendveld (d.2018), who died as the manuscript was being completed. Antonia's death robbed us of a respected colleague, admired mentor, and beloved friend. It also crystallized our realization that the intellectual trajectory of the project matched Antonia's own—and could be told in her own words. Those words, whether delivered with unapologetic directness in conversation, or meticulously rendered in her detailed annual reports, trace a journey from easy confidence in the objectivity of the tools we employed to (re)construct the lifeways and physical contexts of our peasants ("Yes, that's it, I'm certain"); through dissatisfaction with the limitations of those tools to provide convincing answers ("all this keeps alternating my compass needle between skepticism and conviction"); to a re-embrace of their heuristic power in stimulating us to ask further, better questions. To repeat the mantra she adopted herself, over the course of the project those tools became "catalyzers to trigger ideas."

But Antonia was not merely an encapsulation of our journey towards more nuanced understanding. She was, fundamentally, the connective tissue that bound us together. Her purposeful walk, her gruff affection, her swift and decisive embrace of novelty—all these qualities made the labors of each season just that little bit lighter, the heat of the sun and the brain-fracturing din of the town's nightly *calcetto* tournament a bit more bearable. Anti-authoritarian to a fault, she was the proud possessor of the only parking ticket ever known to have been handed out by a member of the carabinieri in the piazza of Cinigiano. Fiercely anti-papist, she regaled us with stories of the gestures she threw at the Vatican from the windows of her small home in Rocca del Papa. Intellectually demanding (some might say uncompromising) she was, also, unfailingly kind: to her collaborators, who marveled at her tireless energy; to her students, who loved her unreservedly; to the farmers, freeholders, tenants, and proprietors of the towns and *poderi* of Tuscany, across which she slowly (oh, so slowly!) drove her Fiat Panda. Above all, it is this kindness that will stay with us all.

Ceramic References and Abbreviations

Ceramic References:

Italic sigillata: Ettlinger 1990; Pugliese Caratelli 1985

Experimental sigillata: See Chapter 10 in this volume, plus Ettlinger 1990 and Pugliese Caratelli 1985

Black glazed ware: Morel 1981

African red slip ware: Hayes 1972; Bonifay 2004; Reynolds, Bonifay, and, Cau 2011

Camulodunum amphorae: Bertoldi 2012

Van der Werff amphorae: Van der Werff 1978; Bertoldi 2012

Spello amphorae: Panella 1989

Dressel amphorae: Martin-Kilcher 2003; Panella 2001; Bertoldi 2012

sigillata chiara tarda dell'Italia centro-settentrionale: Fontana 1998

vernice rossa interna: Aguarod Otal 1991

Color-coated ware (also termed *ingobbiata di rosso*): Fontana 1998; Fontana 2005; Vaccaro 2011; Vaccaro 2019; Menchelli and Pasquinucci 2012; Cantini 2009

Thin wall ware: Pugliese Caratelli 1985; Marabini Moeus 1973

Abbreviations:

Primary source abbreviations follow the *Oxford Classical Dictionary*.

Ceramic Abbreviations Used in Tables:

FW = Fine ware
KW = Kitchen ware
TW = Tableware
ARS = African red slip ware
BGW = Black glazed ware
CCW = Color-coated ware
SCT = *sigillata chiara tarda dell'Italia centro-settentrionale*
VRI = *vernice rossa interna*
AMPH = Amphora
IT SIG = Italic sigillata

ES = Experimental sigillata
CCW/CW = Color-coated ware/Coarse ware
CW/Amph = Coarse ware/Amphora
TK = Tunisian kitchen ware related to ARS
OD = *opus doliare*
AD = *Acroma depurata*

EVE = Estimated vessel equivalent
LPPI = Local Pastoral Pollen Indicators
NPP's = Non-pollen palynomorphs
SU = Stratigraphic unit
TU = Topographic unit
SF = Small find

MNI = Minimum number of individuals
MNE = Minimum number of skeletal elements
NISP = Number of identified specimens
UNID = Unidentified

RRC = Crawford, Michael. 1974. *Roman Republican Coinage*. Cambridge: Cambridge University Press.
RPC = Burnett, A. 1991. *Roman Provincial Coinage*. London: British Museum Press.

Figures: Volume 1

(color insert appears between pages 220 and 221)

1.1	Giovanni Bortolotti, *Capana alle Vergini*, 1921	2
1.2	Reconstruction of San Martino site	3*
2.1	Map of Ghisleni's field survey	24
2.2	Use of mechanical excavator during excavation of Marzuolo, 2012	27
2.3	Use of boom photography during excavation of San Martino, 2010	28
2.4	Pollen sampling from section, Case Nuove, 2010	33
3.1	Map showing location of project area	38
3.2	Map of project area, showing excavated sites and other topographic features	38
3.3	Map, overall geological features of study area	41
3.4	View of rolling Mio-Pliocene hills of central part of project area	42
3.5	View of western part of project area	42
3.6	View of eastern part of project area	43
3.7	View of "Piani Rossi" river terrace	43
3.8	View of Ombrone valley floor	44
3.9	Map, project area drainage network	44
3.10	View of Ombrone River south of Campagnatico	45
3.11	View of Ombrone River south of Paganico	46
3.12	View of Torrente Ribusieri	46
3.13	View of Torrente Trisolla	47
3.14	View of *fontone*, near Cinigiano	48
3.15	View of ground water spring west of Cinigiano	48
3.16	View of tilted strata of clay, sand, loam, and conglomerates, west of Cinigiano	48
3.17	Map of topographic zones in project area	49
3.18	View towards W over the "macigno" sandstone ridge	52
3.19	Land units map and abbreviated legend	*Color Figure*
3.20	Map of field survey results carried out by M. Ghisleni (2010)	56
3.21	Map of late Republican/early imperial-period sites from Ghisleni's survey	57
3.22	Map of high imperial sites from Ghisleni's survey	58
3.23	Map of late antique sites from Ghisleni's survey	59
4.1	Pievina, general topography and Roman sites	64
4.2	Pievina, survey surface data	64
4.3	Pievina, remote sensing results overlaid with excavated remains	65
4.4	Pievina, overall site plan	66
4.5	Pievina, aerial view with students for scale and showing major features	67
4.6	Pievina, plan, Phase 1	68

*Figure also appears in color insert.

4.7	Pievina, view of Structure 1 with drain	68
4.8	Pievina, aerial view of Structure 3, kiln	69
4.9	Pievina, plan, Phase 2.1	70
4.10	Pievina, aerial view of Structure 4	70
4.11	Pievina, reconstruction of Phase 2.1	71*
4.12	Pievina, view from E of drain near Structure 4	71
4.13	Pievina, view into drain from E	72
4.14	Pievina, plan, Phase 2.2	73
4.15	Pievina, comparative presence of functional classes of vessels from 2003 and 1006	78
4.16	Pievina, representative diagnostic ceramics from US 2003	79
4.17	Pievina, representative diagnostic ceramics from late antique contexts	80
4.18	Pievina, comparison between Pievina US 1006 with data from Roselle US 5147=5170 and 5141 (as %MNI)	82
4.19	Pievina, sketch of site showing major geological features	88
4.20	Pievina, land units map	*Color Figure*
4.21	Pievina, land evaluation map, hypothesis I	89
4.22	General map of valley morphology	90
4.23	Pievina, coins (SF 201001–SF 201010 + 201034)	93
4.24	Pievina, coins (SF 201011–SF 201037)	94
4.25	Pievina, metal small finds	96
4.26	Pievina, iron objects	97
4.27	Pievina, diagnostic glass fragments	99
4.28	Pievina, map showing nearest geological outcrops of building stones	102
5.1	Case Nuove, aerial view of hilltop before excavation (2007)	108
5.2	Case Nuove, general topography, Roman sites and springs	108
5.3	Case Nuove, remote sensing results, overlaid with excavated remains	109
5.4	Case Nuove, overall site plan	110
5.5	Case Nuove, view of *opus signinum*-lined tank (SU 5005)	111
5.6	Case Nuove, view of post holes south of *opus signinum* tank	111
5.7	Case Nuove, view of well (SU 5055)	112
5.8	Case Nuove, plan, treading surface (SU 5015)	113
5.9	Case Nuove, view of dump (SU 5062)	113
5.10	Case Nuove, dump (SU 5062), S section	114
5.11	Case Nuove, view of cistern (SU 5047)	115
5.12	Case Nuove, view of square pit (SU 5059)	116
5.13	Case Nuove, square pit, N section	116
5.14	Case Nuove, square pit, S section	117
5.15	Case Nuove, chromatogram of the total lipid extract of SU 5055 (tank)	118
5.16	Case Nuove, chromatogram of the hydrolysis in ethyl acetate of Dolium Sample 1	119
5.17	Case Nuove, chromatogram of the hydrolysis in ethyl acetate of Dolium Sample 2	119
5.18	Case Nuove, reconstruction of press installation in Phase 1	121*
5.19	Case Nuove, representative diagnostic ceramics from late Republican midden contexts (SU 5028, 5030, 5057)	126
5.20	Case Nuove, representative diagnostic ceramics from Phase 1.2	128
5.21	Case Nuove, representative diagnostic ceramics from Phase 1.2	129
5.22	Case Nuove, representative diagnostic ceramics from Phase 1.3	130
5.23	Case Nuove, representative diagnostic ceramics from Phase 1.3	131

*Figure also appears in color insert.

5.24	Case Nuove, representative diagnostic ceramics from Phase 2	132
5.25	Case Nuove, representative diagnostic ceramics from Phase 2	133
5.26	Case Nuove, map of locale showing geological and hydrological features	148
5.27	Case Nuove, geological map of site	149
5.28	Case Nuove + Colle Massari, land units map of locale	*Color Figure*
5.29	Case Nuove, land evaluation map of locale, hypothesis I	150
5.30	Case Nuove, land evaluation hypothesis of area around Case Nuove	151
5.31	Case Nuove, least cost path analysis for movement	152
5.32	Case Nuove, least cost path analysis for movement	*Color Figure*
5.33	Case Nuove, viewshed analysis	154
5.34	Case Nuove, coins	155
5.35	Case Nuove, small finds from SU 5014	156
5.36	Case Nuove, marble fragments (SF 505001) from SU 5014	157
5.37	Case Nuove, four hand mill fragments (SF 505005) from SU 5044	158
5.38	Case Nuove, representative diagnostic glass fragments	159
6.1	San Martino, general topography and Roman sites	164
6.2	San Martino, remote sensing results, overlaid with excavated remains	165
6.3	Aerial view of San Martino, taken with kite	166
6.4	San Martino, overall site plan	167
6.5	San Martino, section, also showing location of pollen samples	167
6.6	San Martino, representative diagnostic ceramics from US 4003, 4005, 4008, 4022, 4025	171
6.7	San Martino + Poggio dell'Amore locales, land units map	*Color Figure*
6.8	San Martino locale, land evaluation map, hypothesis I	174
6.9	San Martino locale, land evaluation map, hypothesis II	175
6.10	San Martino, plan showing various types of building stones	182
6.11	San Martino, map with nearest geological outcrops of building stones	183
6.12	Reconstruction of San Martino site	184*
7.1	Poggio dell'Amore, general topography and Roman sites	186
7.2	Poggio dell'Amore, view of excavations looking W	186
7.3	Poggio dell'Amore, remote sensing results, overlaid with excavated remains	187
7.4	Poggio dell'Amore, aerial view of site after excavation	187
7.5	Poggio dell'Amore, overall site plan	188
7.6	Poggio dell'Amore, SU 6013	189
7.7	Poggio dell'Amore, SU 6009	189
7.8	Poggio dell'Amore, representative diagnostic ceramics from SU 6001, 6002, 6004, 6005, 6011	193
7.9	Poggio dell'Amore, map of locale with geological and hydrological features	195
7.10	Poggio dell'Amore, view of *fontone* from the	196
7.11	Poggio dell'Amore, land evaluation map, hypothesis I	196
7.12	Poggio dell'Amore, land evaluation map, hypothesis II	197
7.13	Poggio dell'Amore, glass SF 406007 and SF 406001	203
7.14	Poggio dell'Amore, plan showing various types of building stones	203
7.15	Poggio dell'Amore, map with nearest geological outcrops of building stones	204
8.1	Colle Massari Romano, general topography, Roman sites and springs	208
8.2	Colle Massari Romano, location of scatters and trenches against aerial photograph	208
8.3	Colle Massari Romano, remote sensing results, overlaid with excavated remains, Trenches 3 and 7	209
8.4	Colle Massari Romano, overall view of site from S, showing SU 7005	210

8.5	Colle Massari Romano, plan of SU 7005	211
8.6	Colle Massari Romano, section through SU 7005	211
8.7	Colle Massari Romano, representative diagnostic ceramics from SU 7002, 7030, 7005	213
8.8	Colle Massari Romano, map of locale showing geological and hydrological features	218
8.9	Colle Massari Romano, view of N section of Trench 5	219*
8.10	Colle Massari Romano, land evaluation map, hypothesis I	220
9.1	Podere Terrato, general topography and Roman sites	222
9.2	Podere Terrato, surface scatters	222
9.3	Podere Terrato, remote sensing results for TU 404, overlaid with excavated remains	223
9.4	Podere Terrato, view of excavated site from the W	224
9.5	Podere Terrato, overall site plan	225
9.6	Podere Terrato, S section, "yard"	226
9.7	Podere Terrato, view E section of drain SU 8021 after excavation	226
9.8	Podere Terrato, Italic sigillata from SU 8001, 8002, 8003, 8005, 8026	231
9.9	Podere Terrato, Thin Walls and Coarse wares from SU 8001, 8003, 8004, 8005, 8007, 8010, 8022, 8026	232
9.10	Podere Terrato, Amphorae (AMPH), Coarse ware/Amphora (CW/AMPH), *Vernice rossa interna* (VRI) and Kitchen ware (KW) from SU 8001, 8003, 8007, 8010, 8021, 8026	233
9.11	Podere Terrato, map of locale with geological and hydrological features	235
9.12	Podere Terrato, view of landscape to W	235
9.13	Podere Terrato and Tombarelle, land units map	*Color Figure*
9.14	Podere Terrato, land evaluation map, hypothesis I	236
9.15	Podere Terrato, land evaluation map, hypothesis II	237
9.16	Podere Terrato, coin finds	245
9.17	Podere Terrato, fibulae of Aucissa type (SF 308003, 308010)	245
9.18	Podere Terrato, plan showing various types of building stones	246
9.19	Podere Terrato, map showing map showing nearest geological outcrops of building stones	247
10.1	Marzuolo, general topography and Roman sites	250
10.2	Marzuolo, map of the Catasto Leopoldino (ca. 1825)	250
10.3	Marzuolo, surface survey results (TU 100, 402, 403)	251
10.4	Marzuolo, surface survey results and gridded collection of TU 403	252
10.5	Marzuolo, remote sensing results for TU 100, including surface survey and magnetometry survey	252
10.6	Marzuolo, remote sensing results for TU 100, including surface survey and ARP survey at 0–0.5 m depth	253
10.7	Marzuolo, overall site plan with areas and trenches indicated	254
10.8	Marzuolo, plan, Area I, phased plan	255
10.9	Marzuolo, plan, Area I, church	255
10.10	Marzuolo, aerial photograph of church and Area I after 2012 season	256
10.11	Marzuolo, plan, Area I, Roman-period remains	257
10.12	Marzuolo, plan, Area I, Trench 1	258
10.13	Marzuolo, view of SU 10023, detail of terracotta bricks	259
10.14	Marzuolo, Area I, Trench 1, SU 10093	259
10.15	Marzuolo, Area I, Trench 1, Italic sigillata from SU 10093	260*
10.16	Marzuolo, Area I, Trench 1, cleaned Italic sigillata from SU 10093	*Color Figure*
10.17	Marzuolo, plan of Trench 2	261

*Figure also appears in color insert.

10.18	Marzuolo, view of terracotta bricks (SU 10066) in Trench 2	262
10.19	Marzuolo, Area I, Trench 3	263
10.20	Marzuolo, view from S, Trench 3	263
10.21	Marzuolo, N section, Trench 3, including location of pollen samples	264
10.22	Marzuolo, E section, Trench 3	264
10.23	Marzuolo, plan, Trenches 4–7	265
10.24	Marzuolo, orthophoto of Trenches 4–7	266
10.25	Marzuolo, E section, Trench 4, Room 1, including pollen samples	266
10.26	Mazuolo, view, Room 1, Feature 1	267
10.27	Marzuolo, view, Room 1, from S, after removal of Feature 1	267
10.28	Marzuolo, E section, Trench 4, Room 1, showing, SU 10086 and drain	268
10.29	Marzuolo, view from S, Trench 5, Room 1	268
10.30	Marzuolo, S section, Trench 5	269
10.31	Marzuolo, view from S, Trench 6, Room 2	269
10.32	Marzuolo, plan, Trench 7, Room 3	270
10.33	Marzuolo, S section, Trench 7, Room 3	271
10.34	Marzuolo, plan of Van Oyen and Vennarucci excavations, 2018	275
10.35	Marzuolo, plan, Area II, Structure 3	277
10.36	Marzuolo, orthophoto, Area II, Structure 3	278
10.37	Marzuolo, plan, Area III, Structure 4 with location of pollen samples	279
10.38	Marzuolo, aerial photo, Area III after excavations in 2012	280
10.39	Marzuolo, plans, kiln SU 11020 and 11052	281
10.40	Marzuolo, view from W, kiln SU 11020	282
10.41	Marzuolo, view from N, kiln SU 11052 with kiln SU 11020	282
10.42	Marzuolo, fragments of perforated muffle(?) fragments from SU 11008, 11009, 11048	283
10.43	Marzuolo, drawing, *tubuli* fragments from SU 11012/11040 and 11048	286
10.44	Marzuolo, fragments of local Experimental sigillata with dotted pattern	287
10.45	Marzuolo, plan of kiln SU 12013	288
10.46	Marzuolo, view from the N, kiln SU 12013	288
10.47	Marzuolo, Phase 1, selected Experimental sigillata (ES) of local production and imported (Area III)	291
10.48	Map showing Marzuolo wares (both Experimental and Italic sigillata) as distributed in the project area	293
10.49	Marzuolo Phase 1, amphorae of local/sub-regional production and imported (Area III)	295
10.50	Marzuolo, Phase 2, selection of local Italic sigillata (IT SIG) dated 50–70 AD from deposit US 10093	296
10.51	Marzuolo, Phase 2, details of the IT SIG deposit (50–70 AD) US 10093	*Color Figure*
10.52	Marzuolo, Phase 2, selection of Color-coated ware (CCW), thin walls (TW), coarse ware (CW) and kitchen ware (KW)	299
10.53	Marzuolo, Phase 2, local/sub-regional and extra-regional amphorae	301
10.54	Marzuolo, Phase 3, African red slip and imitations, CCW and TW wares	303
10.55	Marzuolo, Phase 3, lamps, coarse wares, kitchen wares	305
10.56	Marzuolo, Phase 3, amphorae (AMPH)	306
10.57	Marzuolo, Phase 4, medieval ceramics	307
10.58	Marzuolo, topographic detail of the site with well/cistern	315
10.59	Marzuolo, map of locale: possible clay and fine sand collection points, and other sites with IT SIG (not necessarily produced at Marzuolo)	316
10.60	Marzuolo locale, land units map	*Color Figure*

10.61	Marzuolo locale, land evaluation map, hypothesis I	316
10.62	Marzuolo, coins (SF 210001–212004)	337
10.63	Marzuolo, coins (SF 212005–214069)	338
10.64	Marzuolo, Area III plan showing coin finds	339
10.65	Marzuolo, drawing, iron anvils (SF 310145, 310146) from Area I	343
10.66	Marzuolo, photo, iron anvils (SF 310145, 310146) from Area I	343
10.67	Marzuolo, photo and drawing of copper alloy handle (SF 310131), Area I	345
10.68	Marzuolo, photo of copper pitcher (SF 310144) from Area I	345
10.69	Marzuolo, stone tesserae	346
10.70	Marzuolo, copper alloy objects	347
10.71	Marzuolo, bone pins (SF 511014, 514014, 514015, 514016, 514026, 514064, 514072, 514019, 514025)	347
10.72	Marzuolo, various small finds: sword (SF 314068); awl (310512); die (514032); gaming token (514020)	348
10.73	Marzuolo, loom weights (SF 511005; 512008, 512009, 512010)	348
10.74	Marzuolo, representative glass fragments (SF 410001–410514)	350
10.75	Marzuolo, representative glass fragments (SF 411046–414082)	351
10.76	Marzuolo, Area II, plan showing various types of building stones	355
10.77	Marzuolo, map showing nearest outcrops of building stones	355
11.1	Tombarelle, general topography and Roman sites	362
11.2	Tombarelle, surface survey overlaid with excavation Areas	363
11.3	Tombarelle, plan of cistern (SU 16002)	364
11.4	Tombarelle, view of cistern from W (SU 16002)	365
11.5	Tombarelle, section of cistern (SU 16002)	365
11.6	Tombarelle, 3-D photoscan of cistern (SU 16002)	366
11.7	Tombarelle, Area 1, Trench 2 inside cistern (SU 16002) showing *opus signinum* lining	366
11.8	Tombarelle, Area II, overall plan	367
11.9	Tombarelle, Area II, plan, excavated remains	368
11.10	Tombarelle Area II, section, including location of pollen samples	369
11.11	Tombarelle, Area II, view from W, showing edges of SU 19014	369
11.12	Tombarelle, Area III, overall plan	370
11.13	Tombarelle, Area III, aerial photoscan model	371
11.14	Tombarelle, Area III, view of paved area from W	372
11.15	Tombarelle, Area III, N section of paved area, also showing location of pollen samples	372
11.16	Tombarelle, Area III, aerial photoscan model, paved area	373
11.17	Tombarelle, Area III, S elevation photoscan model, wall SU 17021/17010	373
11.18	Tombarelle, Area III, W elevation photoscan model, wall SU 17012	374
11.19	Tombarelle, Area III, aerial photoscan model view of pit SU 17005	375
11.20	Tombarelle, Area III, view of fills SU 17002 and 17019	376
11.21	Tombarelle, Area IV, plan	377
11.22	Tombarelle, Area IV, W section, Trench 1	377
11.23	Tombarelle, Area IV, E Section, Trench 2	378
11.24	Tombarelle, Area IV, view of Trench 2 from S	378
11.25	Tombarelle, Area II, Phase 1, Black glazed ware (BGW)	381
11.26	Tombarelle, Area II, Phase 1, Experimental sigillata, Italic sigillata, Thin wall ware, lamp, ceramic building materials, and possible wasters	382
11.27	Tombarelle, Area II, Phase 1, amphorae (AMPH)	387
11.28	Tombarelle, Area II, Phase 1, Kitchen wares (KW)	389

11.29	Tombarelle, Area II, Phase 1, Kitchen wares (KW)	390
11.30	Tombarelle, Area II, Phase 1, Coarse ware (CW) jars and jugs	391
11.31	Tombarelle, Area II, Phase 1, Coarse ware (CW) jugs	392
11.32	Tombarelle, Area II, Phase 1, Coarse ware (CW) bottles and open forms	393
11.33	Tombarelle, Area IV, Phase 2, Italic sigillata (IT SIG), amphorae (AMPH), thin walls (TW), Coarse ware (CW)	396
11.34	Tombarelle, Area IV, Phase 2, Kitchen ware (KW) and *vernice rossa interna* (VRI)	397
11.35	Tombarelle, Area III, Phase 3, Color-coated ware (CCW) and Color-coated ware/Coarse ware (CCW/CW)	399
11.36	Tombarelle, Area III, Phase 3, Color-coated ware dishes, imitations of ARS	400
11.37	Tombarelle, Area III, Phase 3, Color-coated (CCW) and Coarse ware (CW) bowls, beakers and lids	401
11.38	Tombarelle, Area III, Phase 3, Color-coated (CCW) and Coarse ware (CW) basins	402
11.39	Tombarelle, Area III, Phase 3, Color-coated (CCW) basins	403
11.40	Tombarelle, Area III, Phase 3, Color-coated (CCW) and Coarse ware (CW) jugs and bottles/flasks	404
11.41	Tombarelle, Area III, Phase 3, amphorae, Color-coated (CCW) and Coarse ware (CW) table jars	405
11.42	Tombarelle, Area III, Phase 3, overfired Color-coated ware (CCW)	406
11.43	Tombarelle, Area III, Phase 3, *opus doliare* (OD), Coarse ware (CW) food processing and measuring cups	407
11.44	Tombarelle, Area III, Phase 3, cooking pots	408
11.45	Tombarelle, Area III, Phase 3, Kitchen ware (KW)	409
11.46	Tombarelle, Area III, Phase 3, kiln spacers	411
11.47	Tombarelle, Area I, Phase 4, representative diagnostic ceramics	412
11.48	Tombarelle, geological map of site	418
11.49	Tombarelle, map of locale showing geological and hydrological features	419
11.50	Tombarelle, land evaluation map, hypothesis I	420
11.51	Tombarelle, land evaluation map, hypothesis II	421
11.52	Tombarelle, SF 519001, 519019, 519022, 519024, stone scrapers, all from Area II Phase 2	427
11.53	Tombarelle, SF 517009, photo of two joining fragments of ceramic mold	428
11.54	Tombarelle, SF 517014, large fragment of tile with stamp in Etruscan	429
11.55	Tombarelle, SF 517014, detail of stamp	429
11.56	Tombarelle, Area I, plan of cistern (SU 16002) with building stones	430
11.57	Tombarelle, Area III, plan of walls of paved area, with building stones	431
11.58	Tombarelle, map showing nearest outcrops of building stones	432

Figures: Volume 2

(color insert appears between pages 586 and 587)

12.1	Podere Tartuchino, Phase 1 (Perkins and Attolini 1987: fig. 5)	437
12.2	Monte Forco, composite plan (Jones 1963: fig. 18)	438
12.3	Poggio Grillo (Barbieri 2005b, fig. 7)	438
12.4	Campo La Noce, composite plan (Di Matteo 2005: fig. 3)	439
12.5	Podere Tartuchino, Phase 2 (Perkins and Attolini 1987: fig. 6)	440
12.6	Podere Cosciano, Phase 1 (Camin and McCall 2003–04: fig. 2)	440
12.7	Podere Cosciano reconstruction (Camin and McCall 2003–04: fig. 3)	441
12.8	Podere S. Mario, Phase 1 (Motta, Camin, and Terrenato 1993: fig. 3)	441
12.9	Site 9, Ager Lunensis (Gadd 1986: fig. 12)	442
12.10	Giardino Vecchio, plan of excavated remains (Cambi 2002: fig. 53)	443
12.11	Villa Sambucco, reconstructed plan and section (Ostenberg 1960: fig. 287)	444
12.12	Selvasecca, plan, phase 2 (Berggren 1969: fig. 27)	445
12.13	Major ceramic classes, along a spectrum a habitation (% MNI), late Republican/early imperial sites only	451
12.14	Major ceramic forms, along a spectrum of habitation (% MNI), late Republican/early imperial sites only	451
12.15	Major tableware forms, along a spectrum of habitation (% MNI), late Republican/early imperial sites only (without Marzuolo Phase 2)	452
12.16	Fine wares, along a spectrum of habitation (% MNI), late Republican/early imperial sites only (without Marzuolo Phase 2)	452
12.17	Multiple correspondence analysis plotted as biplot for all data categories, all sites	458
12.18	Multiple correspondence analysis plotted on a biplot for grouped data from all sites	458
12.19	Multiple correspondence analysis plotted as a moonplot	459
12.20	Graphic representation of broad ontologies connecting object type and function	461
12.21	Non-metric multidimensional scaling (nMDS) analysis of small finds from project sites, using broad ontologies shown in Fig. 12.20	461
12.22	Correspondence analysis using the bootstrap of domains based on one-to-one relationship with small finds, plotted as convex hulls for late Republican/early imperial sites	462
12.23	Correspondence analysis using the bootstrap of domains based on one-to-one relationship with small finds, plotted as convex hulls for late antique sites	463
12.24	Diagram of distributed habitation	464
12.25	Diagram of spectrum of habitation, with project sites mapped against hypothetical use periods	465
13.1	Land evaluation map, project study area, Hypothesis I	474

13.2	Land evaluation map, project study area, Hypothesis II	474
13.3	Land evaluation from Hypothesis I, combined with late Republican/ early imperial sites from Ghisleni 2010	*Color Figure*
13.4	Land evaluation from Hypothesis II, combined with late Republican/ early imperial sites from Ghisleni 2010	*Color Figure*
13.5	Theoretical distribution of forests based on land evaluation, assuming "N" land forested	478
13.6	Theoretical distribution of forests based on land evaluation, assuming "N" and "S3" land forested	478
13.7	Theoretical distribution of forests based on land evaluation assuming "N" "S3" and "S2" land forested	479
13.8	Actual distribution of forests in Project area according to the data of the Regione Toscana	479
13.9	Land use hypothesis for Marzuolo, San Martino, Poggio dell'Amore, Podere Terrato, and Tombarelle	485
13.10	Percentages of cereals pollen (avg.) along the habitation spectrum (time)	487
13.11	Percentages of grape and olive pollen (avg.) along the habitation spectrum (time)	488
13.12	Percentages of grape and olive macroremains along habitation spectrum (time)	489
13.13	Percentages of LPPI (w/ Cichorieae, averaged) along the habitation spectrum (time) (KB)	490
13.14	Land units vs percentage of survey categories from Ghisleni 2010	491
13.15	Cereal, fodder/legumes and LPPI (w/out Cichorieae) pollen percentages, late Republican sites	494
13.16	Cereal, fodder/legumes and LPPI (w/out Cichorieae) pollen percentages, late antique sites	494
13.17	Major domesticates for late Republican/early imperial project sites, plus Santa Marta villa and regional average (% NISP)	506
13.18	Major domesticates for late antique project sites, plus Santa Marta villa and regional averages. (% NISP)	507
14.1	Cooking ware forms, all sites, by period (average % MNI)	532
14.2	Cooking ware forms, open versus closed forms, by period (avg. %MNI)	532
14.3	Major ceramic forms, all sites, by period (avg. %MNI)	534
14.4	Tableware forms, all sites, by period (avg. %MNI)	535
14.5	Tableware forms, open versus closed forms, by period (avg. %MNI)	536
15.1	Regional coin finds by period	549
15.2	Major ceramic classes by period, all sites, by % MNI	554
15.3	Map of kilns, identified in Ghesleni's 2009 survey	558
15.4	Map, Distribution of known Italic sigillata workshops in central Italy	559
16.1	San Martino, wall elevation (SU 4012)	569
16.2	Marzuolo, Area II, (SU 11011/11013) wall elevation	569
16.3	Marzuolo, Area III, wall (SU 13011) showing two-faced construction	570
16.4	Pievina, detail of pisé (?) in collapse (SU 1105)	*Color Figure*
16.5	Poggio dell'Amore, detail of pisé (?) in collapse from wall SU 6004	*Color Figure*
16.6	Diagram of tools and formwork used in pisé construction (Centre de recherche et d'application—Terre 1979: fig. 7)	571
16.7	Diagram of pisé ramming technique with formwork (Houben and Guillaud 1994,175)	572
16.8	Diagram of cob puddling and wall building (after Houben and Guillaud 1994:179)	573
16.9	San Martino, detail of drip edge (SU 4030)	575

16.10	Map of project sites and the location of their respective building stones	577
16.11	Number of geologically distinct types of building stones used in sites along the spectrum of habitation	578
16.12	Distance to furthest geological source for building stone in sites along the spectrum of habitation	579
16.13	Pievina, beaten earth surface (SU 1538) from Phase 2	581
16.14	Podere Terrato, detail of beaten earth surface in "yard" (SU 8004, 8007, 8010, 8026)	582
17.1	Map of the modern *commune*, with roads and major population centers	588
17.2	Map of excavated sites with nearest outcrops of building stones	590
17.3	San Martino-Poggio dell'Amore Route 1	591
17.4	San Martino-Poggio dell'Amore Route 2	592
17.5	Least cost path for Arcidosso-Cinigiano routes	593
17.6	Least cost path from the four sites where red conglomerate and crystalline sandstone were found as building blocks, to the quarry of Montenero	593
17.7	Map showing Marzuolo wares (both Experimental and Italic sigillata) as distributed in the project area	594
17.8	Monticello to Paganico least cost path I	594
17.9	Monticello and Paganico least cost path II	595
17.10	Case Nuove least cost path with cost distance sliced into 2500-size "effort units"	*Color Figure*
17.11	Overview of the ford and ferry points over the Orcia, Ombrone, and Zancona/Ente in the region as identified on the Catasto Leopoldino	598
17.12	Detail of Fig. 17.11, showing possible crossing points of the Zancona valley, as identified on the Catasto Leopoldino	599
17.13	Detail of Fig. 17.11, central crossing point of the Zancona valley identified on the Catasto Leopoldino	599
17.14	Detail of Fig. 17. 11, southernmost crossing point of the Zancona valley according to the Catasto Leopoldino	600
17.15	Torrente Zancona area, at modern bridge over the river	600
17.16	Fording point at Podere de Noce, near Paganico	601
17.17	Least cost path from Tombarelle and Marzuolo to the beginning of the road to Siena	605
17.18	Reconstructed path through the hills between Roselle and the Ombrone River overlain on the Catasto Leopoldino	*Color Figure*
17.19	Proposed paths between Podere Marzuolo and Torrenieri	606
17.20	Part of the proposed paths on the IGM topographical map	607
A.1	Elementary school archaeology unit, Scuola Primaria di Cinigiano G. Alfieri, 3rd–5th grades, archaeological timeline	*Color Figure*
A.2	Elementary school archaeology unit, Scuola Primaria di Cinigiano G. Alfieri, 3rd–5th grades, archaeological ceramics workshop	*Color Figure*

Tables: Volume 1

2.1	Tables of classes used in the legend of the Land Units map	30
3.1	Complete legend of the Land Units Map of the *commune* of Cinigiano	50
4.1	Pievina, major excavated contexts with diagnostic ceramics/dates	74
4.2	Pievina, ceramic classes, all phases, by MNI and %MNI diagnostics	76
4.3	Pievina, ceramic form/functions, all phases, by MNI and % of MNI diagnostics	77
4.4	Pievina, ceramic classes from Pievina SU 1006 (mid- to late 5th c.) compared with the data from Roselle SU 5147=5170 and 5141 (late 4th–5th c.)	83
4.5	Pievina, faunal remains, NISP and MNI values by temporal phase	85
4.6	Pievina, faunal remains, UNID counts by temporal phase	86
4.7	Pievina, faunal remains, % NISP and MNI values by temporal phase for principal domestic meat taxa	86
4.8	Pievina, NISP and MNE frequency of skeletal part categories for cattle, sheep/goat and pig for Phases 2.1 and 2.2	86
4.9	Pievina, coin finds by stratigraphic context, organized chronologically	91
4.10	Pievina, quantification of glass vessels by fragment count, weight, and estimated vessel equivalent by depositional phase	98
4.11	Pievina, chronological distribution of glass vessels and their depositional phase	100
5.1	Case Nuove, major excavated contexts with diagnostic ceramics/dates	122
5.2	Case Nuove, ceramic classes, all phases, by MNI and %MNI diagnostics	124
5.3	Case Nuove, ceramic forms/functions, all phases, by MNI and %MNI diagnostics	124
5.4	Case Nuove, faunal remains, NISP and MNI values by temporal phase	134
5.5	Case Nuove, faunal remains, UNID counts by temporal phase	136
5.6	Case Nuove, faunal remains, % NISP and MNI values by temporal phase for principal domestic meat taxa	136
5.7	Case Nuove, faunal remains, NISP and MNE frequency of skeletal part categories for sheep/goat and pig for Phase 1.2	137
5.8	Case Nuove, pollen analysis	139
5.9	Case Nuove, non-pollen palynomorphs and microcharcoals analysis	144
5.10	Case Nuove, macrocharcoal analysis	145
5.11	Case Nuove, macroremains analysis	146
5.12	Case Nuove, coins by stratigraphic context, organized chronologically	155
5.13	Case Nuove, quantification of glass vessels by fragment count, weight, and estimated vessel equivalent by depositional phase	158
6.1	San Martino, major excavated contexts with diagnostic ceramics/dates	168
6.2	San Martino, ceramic classes by MNI and % of MNI diagnostics	169

6.3	San Martino, ceramic forms/functions by MNI and %MNI diagnostics	169
6.4	San Martino, tile fragments, forms, weights and quantities	172
6.5	San Martino, faunal remains	173
6.6	San Martino, pollen analysis	176
6.7	San Martino, non-pollen palynomorph and microcharcoal analysis	179
6.8	San Martino, macroremains analysis	180
7.1	Poggio dell'Amore, major excavated contexts with diagnostic ceramics/ dates	190
7.2	Poggio dell'Amore, ceramic classes by MNI and % of MNI	191
7.3	Poggio dell'Amore, ceramic forms/functions by MNI and %MNI	191
7.4	Poggio dell'Amore, tile fragments, forms, weights and quantities	194
7.5	Poggio dell'Amore, faunal remains	194
7.6	Poggio dell'Amore, pollen analysis	198
7.7	Poggio dell'Amore, non-pollen palynomorph and microcharcoal analysis	200
7.8	Poggio dell'Amore, macroremains analysis	202
8.1	Colle Massari Romano, major excavated contexts with diagnostic ceramics/dates	212
8.2	Colle Massari Romano, ceramic classes by MNI and %MNI of diagnostics	212
8.3	Colle Massari Romano, pollen analysis	214
8.4	Colle Massari Romano, non-pollen palynomorph and microcharcoal analysis	217
9.1	Podere Terrato, major excavated contexts with diagnostic ceramics/ dates	227
9.2	Podere Terrato, ceramic classes ceramic classes by MNI and %MNI	228
9.3	Podere Terrato, ceramic formal/functional classes by MNI and %MNI	229
9.4	Podere Terrato, faunal remains	234
9.5	Podere Terrato, pollen analysis	238
9.6	Podere Terrato, non-pollen palynomorph and microcharcoal analysis	242
9.7	Podere Terrato, macroremains analysis	243
10.1	Marzuolo, Area I, major excavated contexts with diagnostic ceramics/ dates	272
10.2	Marzuolo, Area III, major excavated contexts with diagnostic ceramics/ dates	284
10.3	Marzuolo, ceramic classes, all phases, by MNI and %MNI of diagnostics	290
10.4	Marzuolo, ceramic forms/functions, all phases, by MNI and %MNI of diagnostics	292
10.5	Marzuolo, list of the Italic sigillata stamps	297
10.6	Marzuolo, Phase 2 amphorae, by type and MNI and % of amphorae	300
10.7	Marzuolo, EVE calculations, Phase 3, Areas I and III, with other project sites for comparison	302
10.8	Marzuolo, Phase 3 amphorae, Area I and Area III, by type and MNI and %MNI of amphorae	302
10.9	Marzuolo, faunal remains, NISP and MNI values by temporal phase	308
10.10	Marzuolo, faunal remains, UNID counts by temporal phase	309
10.11	Marzuolo, faunal remains, NISP and MNE frequency of skeletal part categories for cattle, sheep/goat and pig	310
10.12	Marzuolo, % NISP and MNI of skeletal part categories for cattle, sheep/goat, and pig	310
10.13	Marzuolo, faunal remains, Phase 3, Area I, NISP and MNI values	311
10.14	Marzuolo, faunal remains, Phase 3, Area I, UNID counts	311
10.15	Marzuolo, faunal remains, Phase 3, Area II, NISP and MNI values	311

10.16	Marzuolo, faunal remains, Phase 3, Area II, UNID counts	311
10.17	Marzuolo, faunal remains, Phase 3, Area III, NISP and MNI values	312
10.18	Marzuolo, faunal remains, Phase 3, Area III, UNID counts	312
10.19	Marzuolo, pollen analysis, all areas, all phases	318
10.20	Marzuolo, non-pollen palynomorph and microcharcoal analysis, all areas, all phases	326
10.21	Marzuolo, macrocharcoal analysis, all phases	326
10.22	Marzuolo, macroremains analysis, all areas, all phases	328
10.23	Marzuolo, coin finds by stratigraphic context, within which organized chronologically	340
10.24	Marzuolo, quantification of glass vessels by fragment count, weight, and estimated vessel equivalent by depositional phase	352
11.1	Tombarelle, Area I, Phase 1 and 4 major excavated contexts with diagnostic ceramics/dates	379
11.2	Tombarelle, Phase 1, Area II, major excavated contexts with diagnostic ceramics/dates	380
11.3	Tombarelle Phase 2, Area IV major excavated contexts with diagnostic ceramics/dates	383
11.4	Tombarelle, Phase 3, Area III, major excavated contexts with diagnostic ceramics/dates	383
11.5	Tombarelle, ceramic classes, Phases 1–3, by MNI and %MNI of diagnostics	385
11.6	Tombarelle, ceramic forms/functions, Phases 1–3, by MNI and %MNI of diagnostics	385
11.7	Tombarelle, Phase 3, EVE calculations for Area III ceramics, with project sites for comparison	410
11.8	Tombarelle, Phase 3, quality of the red coatings in the Color-coated ware	410
11.9	Tombarelle, Phase 4, ceramic classes	411
11.10	Tombarelle, faunal remains, NISP and MNI values by temporal phase	414
11.11	Tombarelle, faunal remains, UNID counts by temporal phase	415
11.12	Tombarelle, NISP and MNE frequency of skeletal part categories for cattle, sheep/goat and pig	416
11.13	Tombarelle, % NISP and MNI for cattle, sheep/goat and pig	416
11.14	Tombarelle, pollen analysis	422
11.15	Tombarelle, non-pollen palynomorph analysis	424
11.16	Tombarelle, macroremains analysis	425

Tables: Volume 2

12.1	Summary of material culture (ceramics, small finds, faunal material, MNI) by site	446
12.2	Major ceramic forms, all sites	447
12.3	Multiple correspondence data, all sites	454
12.4	Factors for each site/phase used in multiple correspondence analysis	456
13.1	Percentage of land occupied by the various evaluation classes in the project locale: Hypothesis I	475
13.2	Percentage of land occupied by the various evaluation classes in the project locale: Hypothesis II	475
13.3	Percentage of late Republican/early imperial survey sites located on various land evaluation classes: Hypothesis I	475
13.4	Percentage of late Republican/early imperial survey sites located on various land evaluation classes: Hypothesis II	475
13.5	Woodland composition, including AP/NAP ratios and different woodlands, all sites	476
13.6	Pasture indicators, LPPI and NPP, all sites	480
13.7	Cereal indicators, including pollen, macroremains, and NPPs, all sites	481
13.8	Fodder (legumes, pulses, and other fodder) indicators, including pollen and macroremains, all sites	483
13.9	Grape and olive indicators, including pollen and macroremains, all sites	488
13.10	Cereal, fodder/legumes and LPPI (w/out Cichorieae) pollen percentages, all sites	493
13.11	Faunal remains, all sites, NISP relative frequencies for consumed taxa	499
13.12	Faunal remains, all sites, MNI by taxon, age category and site	500
13.13	Faunal remains, all sites, cattle, relative frequency by skeletal part category, calculated on the basis of NISP and MNE	501
13.14	Faunal remains, all sites, sheep/goat, relative frequency by skeletal part category, calculated on the basis of NISP and MNE	502
13.15	Faunal remains, all sites, pig, relative frequency by skeletal part category, calculated on the basis of NISP and MNE	503
13.16	Faunal remains, all sites, relative frequency of UNID counts by site	504
13.17	Faunal material, NISP values for sites in Tuscany and central Italy arranged by temporal phases	508
14.1	Ceramics, formal classes, all sites (%MNI)	528
15.1	Count of all coins recovered showing coin finds by site, by denomination	545
15.2	Relative proportion of all coins recovered by site, by denomination	545
15.3	Length of excavation and average rate of recovery of coins by site	546
15.4	Regional coin finds by period	547
15.5	Origin analysis of project ceramics, individual sites, by % MNI	550

15.6	Origin analysis of project ceramics, project averages, by % MNI	551
15.7	Extra-regional origin analysis of project ceramics, individual sites, by % MNI	552
15.8	Extra-regional origin analysis of project ceramics, project averages, by % MNI	553
15.9	Glass finds by site quantified by number of fragments	555
15.10	Glass finds by site quantified by the estimated vessel equivalent (EVE) of fragments	556
15.11	Total count (fragments + intact) of metal finds by site	562
16.1	Geologically distinct building stones from project sites, quantities and distance	576
16.2	Presence of iron nails from project sites, organized by weight (g)	580
16.3	Presence of copper alloy nails from project sites	581
16.4	Duration of use for project sites	583
19.2a	Ceramics classes, all sites	643
19.2b	Ceramics form/function, all sites	644
19.3a	Faunal materials, NISP relative frequencies for consumed taxa, all sites	649
19.3b	Faunal materials, Minimum number of individual (=MNI) by taxon, age category and site, all sites	650
19.3c	Faunal materials, cattle – Relative frequency by skeletal part category, calculated on the basis of NISP and MNE, all sites	651
19.3d	Faunal materials, sheep/goat – Relative frequency by skeletal part category, calculated on the basis of NISP and MNE, all sites	652
19.3e	Faunal materials, pig – Relative frequency by skeletal part category, calculated on the basis of NISP and MNE, all sites	653
19.3f	Faunal materials, relative frequency of UNID counts by site, all sites	654
19.4	Composite pollen table, all sites/phases in chronological order	656
19.6b	Total count (fragments + intact) of small finds, by site	692
19.6c	Iron nail dimensions	694
19.6d	Copper nail dimensions	712

Part I

Old Questions and New Data

1

Introduction

Inventing Roman Peasants

Kim Bowes

What can we know about the lives of the rural poor? The two figures (Figs. 1.1 and 1.2) seem to suggest we can know them well, even intimately. In a 1931 photograph from the Agro Pontina south of Rome, a girl holds her infant brother or sister while the family's pigs swirl around her feet and a house of reused wood stands behind her. Taken by Giovanni Bortolotti, a land surveyor, the image documents what was regarded as the primitive backwardness of the Pontine denizens, a primitiveness that Bortolotti's employers, the fascist state, proposed to "solve" through a massive campaign of drainage and modernization.

The second image is a reconstruction of one of the first sites excavated by this project, San Martino. The product of a collaboration with artists-*cum*-archaeologists, Studio InkLINK, Florence, and the data from the excavation, the image was intended to convey something of the lived experience gleaned from stratigraphy, ceramic and topographic studies. Set during a putative wheat harvest, the image sought to be factual—down to the Dressel 1 amphorae leaning against the wall—while invoking something of the quotidian found in the photograph of the Pontine girl.

Both images are fantasies. The photograph, intended to document rural conditions in a "backward" region, is a powerful piece of rhetoric, a statement about modernity and the primitive by way of an autochthonous nationalism (Harris forthcoming). The second, likewise a documentary attempt, turned out to be almost entirely incorrect in its evidentiary basis. The building at San Martino would emerge not as a house but a temporary animal stall; the roof was probably originally tiled and later recycled; the area around the site was used for pasture, not cereal crops; and even the presence of those Dressel amphorae was exaggerated. Our own modern sense of what constituted a "peasant" and his/her house led us completely astray.

The imaginary quality of both images derives not only from their atavism, but their activism, a sense that the lives of rural peasants matter. The Bortolotti image is part of a historical awakening, that moment in the later 19th and early 20th centuries when Europeans began to understand rural poverty as an urgent problem to be solved, a crisis of modernity itself. And our own image was meant to be activist in a scholarly context, drawing attention to the Roman rural poor as an essential piece of Roman history.

The Roman Peasant Project (RPP), whose results follow in this volume, was begun as a systematic effort to understand the lives of rural smallholders, specifically in southern Tuscany where the project was based. As such, the RPP stands as part of a long tradition of "peasant studies"—historical, anthropological and economic work that began in the late 19th and early 20th centuries, of which Bortolotti's image is a part. At the same time, the project was intended

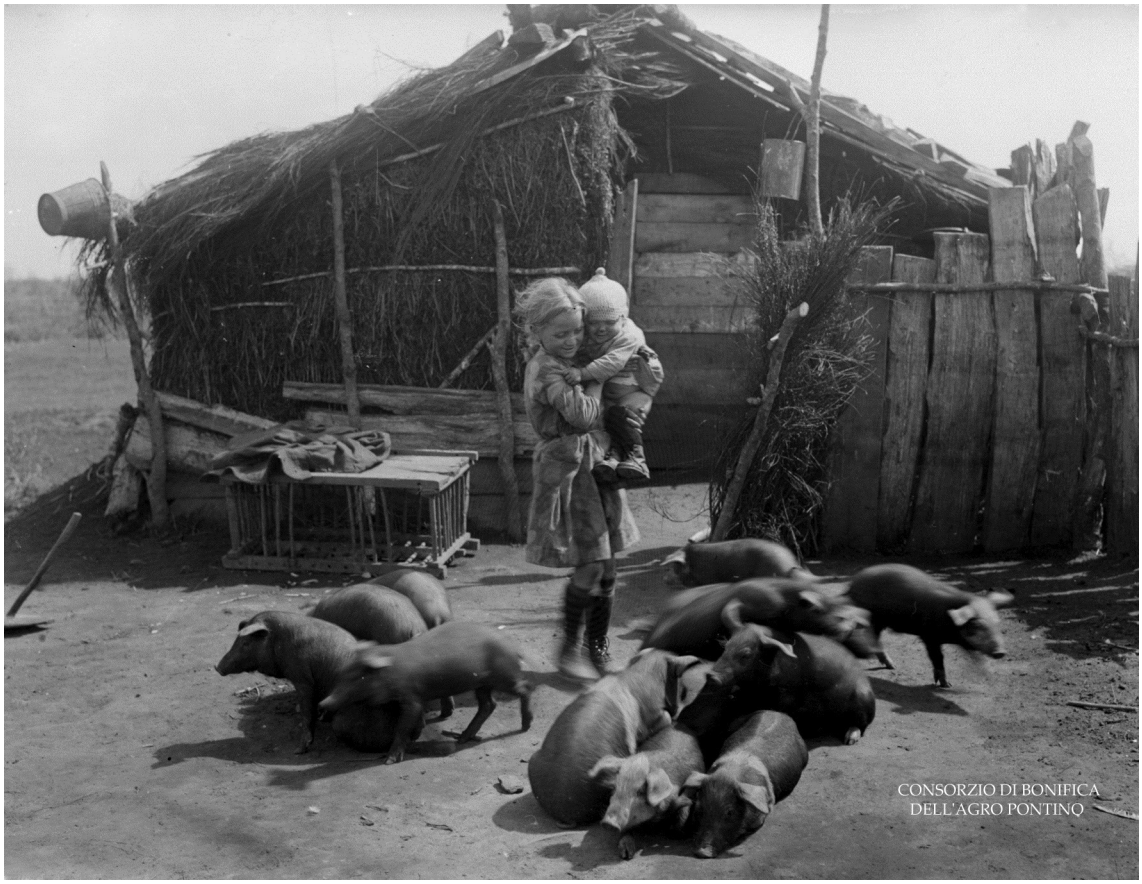


Fig. 1.1 Giovanni Bortolotti, Capana alle Vergini, 1921 (Copyright Fondo Fotografico Bortolotti/Archivo Storico Consorzio di Bonifica dell'Agro Pontina).

to break new ground, shifting classical archaeology away from a largely elite-oriented historical and archaeological agenda towards the non-elite rural dwellers who constituted the majority of ancient populations.

The RPP began with a series of deceptively simple questions, questions which have animated peasant studies since their origins and which seemed to be the essential, missing building blocks for a Roman history from below: where did Roman peasants live? What did they eat? How did they use their land? What defined the Roman peasant economy and peasant culture? The apparent simplicity of these questions and the expectation that their answers would be singular and definite were every bit as much a fantasy as our two images. Some of these questions turned out to be the wrong ones to ask if we were interested in the lives of the rural non-elite; some presupposed a set of analytical assumptions that were, themselves, open to challenge on both substantive and theoretical grounds; still others turned out to be good questions, but unanswerable with our data. The armature of nostalgia and presentism, so embedded in the above two images, runs through the history of peasant studies just as they inevitably shaped this project.

The results of the Roman Peasant Project thus challenged many of our own assumptions, and those of the several disciplines with which we engaged. The San Martino image is representative of our biggest erroneous assumption, that peasants lived in a singular peasant house. The presumed existence of a distinct peasant culture or economy likewise ran up against the abundant evidence of its absence—an integrated world of knowledge, praxis and exchange common to elites and non-elites alike. Peasants' relationships with their "environment" would emerge as iterative, rather than determined, their own insistent and stubborn hands shaping a malleable land, and doing so,

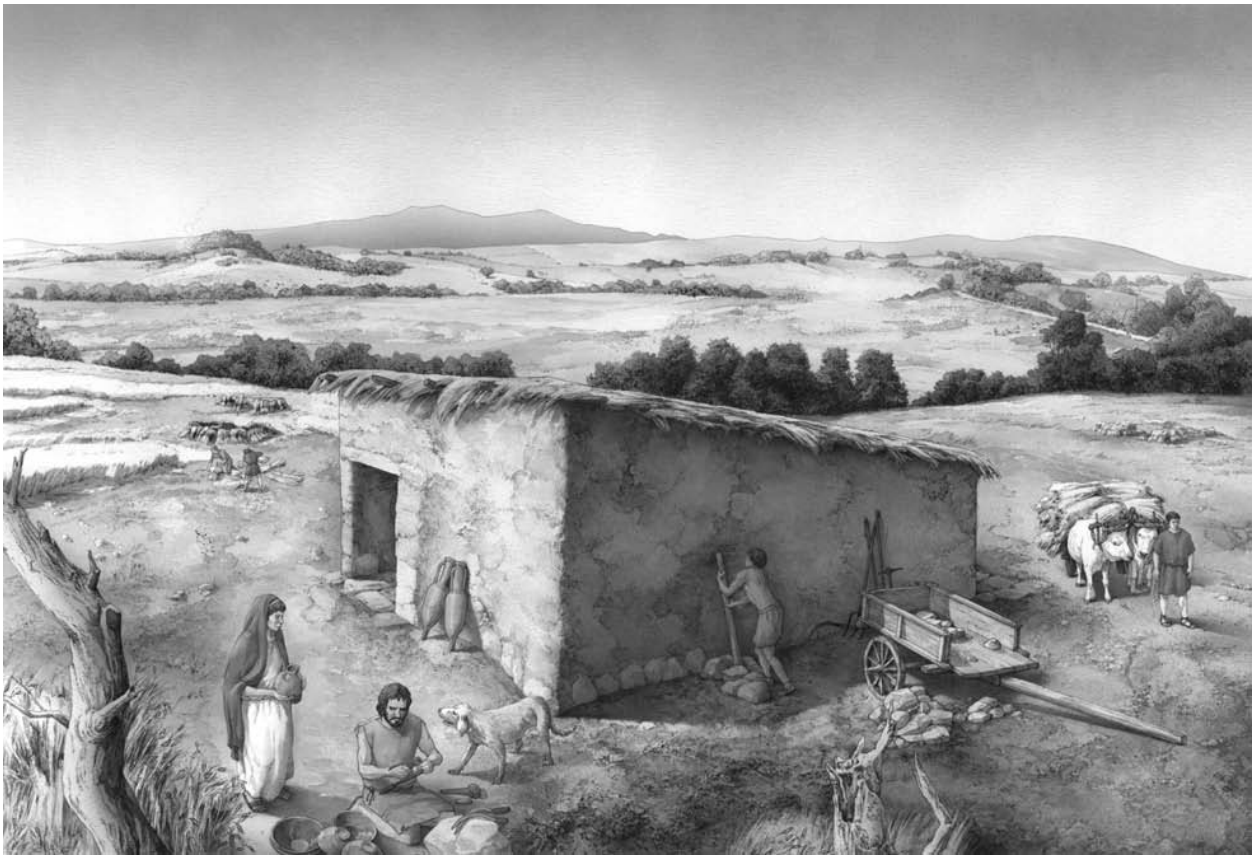


Fig. 1.2 Reconstruction of San Martino site (Studio Inklink). (See also color insert.)

moreover, on a time scale of years or decades. All of these qualities were subject to short-term and long-term change, often dramatic in its tempo and utterly confounding of the discipline's assumption of peasant conservatism and unchanging timelessness.

1.1 Peasants: Definitions

What do we mean when we talk about peasants? The word has a long, rich, and not entirely unproblematic history, both as a descriptive noun and as an analytical concept. By adopting it, therefore, we are forced to acknowledge that history, and to take our place within it. In what follows, we sketch briefly both the etymological and the scholarly trajectories of the term. We suggest that, notwithstanding the moralizing baggage that attends the concept and the vexing imprecision of contemporary usage, it remains a useful tool for fixing attention upon an extensive, if demographically and socioeconomically diffuse sector of the population. The Latin term *paganus* has long been mired in a pejorative etymology: originating from *pagus*—the term for a rural administrative district—in its adjectival form it might mean a rural person, but such a person, when not functioning as a cipher for an idealized seat of rustic moral virtue, was more often an uncouth or unlearned one. It is from these roots that the church would derive its own "pagan" as an ignorant believer of the traditional gods. The early and later medieval usage (French *paisent*/ Middle English *paissaunt*) jettisoned the Roman bucolic connotations and emphasized peasants illiteracy, viciousness and amorality (Le Goff 1980). With the advent of capitalist market economies, the term came to describe rural dwellers whose existence was supposed to take place outside those economies, either present or past, as adhering to so-called natural economies (Wolf 1966).

It is only once those assumptions of timelessness and apartness were challenged, above all with Wolf's seminal 1966 volume *Peasants*, and his later *Europe*

and the People without History, that the term could begin to be reclaimed and rehabilitated (Wolf 1966, 1982). Wolf's insistence that peasants were integral to and part of the larger forces of globalism and capitalism (about which more below), sowed the seeds for an evolving definition of peasant that took into account broader social/historical forces. Since his and Shanin's work of the 1970s and '80s, a "peasant" might be multiple and heterogeneous (Shanin 1980, 1988, 1990a.). New work on everything from late antiquity to modern Guatemala now uses the term with a minimum of framing, and a concomitant conversation has begun about the economic distinctions between peasant and other small commodity producers as being a matter of degree of market dependence, not its presence or absence (Bernstein and Byers 2001; Akram-Lodhi, Haroon and, Kay 2010; Grey 2011). This is not to say the term has been cleared of its baggage (Shanin 1980; Kearny 1996), rather, that the baggage now has enough rich interrogation that the term becomes actually more useful through its layered complexity (Narotsky 2016; Grey 2011).

In keeping with the current trends that recognize the unboundedness of the term "peasant" and the desirability of leaving the analytical category to which it refers as open as possible, this project adopted a maximalist and descriptive definition, applying both methodological and theoretical tools to the task of identifying and labeling the denizens of the countryside in the Roman period. In the first instance we sought data to support our contribution to the debate over the nature and lifeways of the "peasantry" in rural contexts from which elites were absent: not villas, not bath-complexes, not temples. The great advantage of this approach was that it allowed us to recover a richer and broader textural palette of rural life in the Roman period than hitherto, and to avoid prejudging and pre-defining its parameters.

The richness of our data, in turn, both responded to and fed an analytical understanding of the category "peasant" to include not only the single-family smallholders of the romantic (re)constructions with which we began this chapter, but also individuals who could, in other contexts, be described as tenants, wage laborers, seasonal laborers, slaves, and rural craftspeople When we talk about peasants in this volume, it is to this heterogeneous category of rural denizens to which we refer, a category perhaps best summed up by the term most characteristically used for them in our ancient sources: *rustici* (cf. Grey 2011:32–33). This definition is more expansive than most, which still tend to limit "peasant" to those who own their own land or some other means of production, particularly the labor of their family (Shanin 1990a:23). However, neither control over means of production nor ownership of land find their way into our definition. We have not included landholding largely because ownership is impossible to detect archaeologically. Indeed, as we will have repeated cause to remind the reader, archaeology is almost always mute on questions of legal category, tenurial arrangements or ownership. As almost all the definitions and debates about peasants center on these concepts, it became apparent we would best serve our evidence by removing them as qualifiers. This, too, meant that the categories of rural denizens that appear in Latin legal sources are similarly unhelpful. Indeed, our expansive definition also follows new work in acknowledging the overlapping nature of Roman tenurial and labor categories (Foxhall 1990; Grey 2011:27–28): one might, for example, be a small proprietor who expanded his/her portfolio by renting land and did wage or seasonal labor to supplement their agricultural output.

1.2 Historiography I: Roman Peasant History and the Ancient Swerve

As noted above, this project began from a stated aporia: the sense that the lives of the non-elite rural majority were often left out of Roman historical narratives. The project proposed to address that lacuna through an archaeologically based project that would use material culture to begin to fill in the gaps. The claim that there is such a gap in Roman history would seem to require some justification given the rich inheritance of studies that engage with matters of agricultural production, exchange, and other topics that, in other disciplinary traditions, have marked a direct engagement with agrarian history. What follows is such a justification, framed as a historiography of Roman peasant studies alongside the study of peasants in allied disciplines, including archaeology. The justification, then, is a comparative one and permits us to signal as we do so the intellectual origins of this project as it both intersects—and does not—with these other histories. The history of Roman peasant studies

is punctuated, as we see it, by a series of swerves, moments when Roman history and archaeology hinted at, but ultimately turned away from opportunities to make bottom-up history a disciplinary focus.[1]

That story begins, as does so much of socioeconomic history, with Marx, or better, the Marxian moment. Until late in his life, Marx himself was largely uninterested in peasants, focusing instead on the urban proletariat and leaving under-theorized the rural working classes, whose seeming lack of historical evolution, even lack of clear definition as a class, somewhat confounded his historical teleologies (Marx 1979:187; cf. Marx and Engels 1976; Shanin 1990c). Others would be left to fill out a place for a rural working class in the revolutions of the period. But Marx's armature of successive pre-capitalist and capitalist phases evoked a response from ancient historians who, in the turbulent years of the 1840s and beyond, sought the character and history of ancient rural peoples as prequel to their own country's identities and struggles in the present. Indeed, one can argue that for much of the early part of our discipline, Roman history revolved around a set of teleologies centered on peasants, and that for nearly a century, it was the fate of peasants in particular which defined the arc of Roman history.

As Momigliano has described, Marx's articulation of primitive or tribal communism as the earliest mode of production demanded ancient historians' response: debates over the existence or not of collective property ownership in ancient societies rocked German universities, particularly after the revolutions of 1848, and even Theodor Mommsen found himself forced to weigh in on behalf of the Romanists (Momigliano 1982). In the second edition of his *Römische Geschichte*, set out in part as a response to current arguments about ancient German villages as an example of early collectives crushed by Roman individualism, Mommsen characterized the archaic Roman *gens* as having held property in common, a practice which ended with the reforms of Servius Tullius and the advent of the Republic (Mommsen 1856). A decade later, Fustel de Coulanges's *La cité antique* would propose precisely the opposite scenario: also responding to the post-1848 revolutions, particularly the Paris socialist commune of 1871 and keen to defend private property rights, Fustel's archaic Roman farmer was defined by his ownership of land, a fact so essential it served as the basis for Roman religion, with household and ancestral gods who embodied the family's land (Fustel de Coulanges 1864). At stake in this fundamental disagreement was a question that was to have long play in peasant studies, especially in the decades following the Second World War, namely, whether it was more appropriate to conceive of ancient peasants as essentially primitive in their economic rationality, social and political actions, or to assume that their behaviors could effectively be understood with reference to modern sensibilities.

It was in the work of Max Weber and his slightly younger Russian contemporary, Mikael Rostovtzeff, that the long-term influence of these post-1848 debates and the long arc of Marxist thought would be digested for generations of later Roman historians. An immense bibliography has sought to make sense of Weber's and Rostovtzeff's positions vis-à-vis Marxism and each other (Momigliano 1984; Bruhns and Andreu 2004; Bruhns 2005). For our purposes, it is sufficient to note Weber's debt to his teacher Mommsen's characterization of an archaic Roman collective along Marxist lines, to Augustus Meitzen, a historian of medieval land tenure, and to the contemporary debates on contemporary peasant land ownership that continued to ripple out from Marx and Engels's *Manifesto* (Momigliano 1982). In keeping with his insistence that social and political structures, not simply modes of production, produced the arc of economic history, Weber's *Römisches Agrargeschicte* keeps Mommsen's characterization of early Roman communal land as well as smaller private plots, but provides a wealth of detailed formulations on plot size, village administrative units and rights, and the existence of wages and other aspects of rural life (Weber 1891). From this wealth of detail, extrapolated from the scanty ancient evidence on the basis of medieval land tenure, springs a long-term arc of Roman socioeconomic history in which peasants play the starring role: the village collectives of early Republic were ultimately destroyed by mid-Republican conquests in which the new *ager publicus* was put up for sale, doing away with the collective component of peasant land use and opening the door on land-grabs by the wealthier. In their place grew the private farm and the "peasant manor owner." Weber's characterization of this peasant owner in his later collected writings, *Gesammelte Aufsätze zu Sozial-und "Wirtschaftsgeschichte* of 1924 (Weber 1924),

is tellingly based on an American ideal, and would have an enormous impact, directly or indirectly, on characterizations of the Roman landscape:

> In Greece the agrarian policies of the democracies made the village the basic unit of society. In Rome, agrarian policies had precisely the opposite effect. Indeed, to make a bold comparison, they had something like an American character. The American farmer lives on his single family farm, outside any village. His property is defined by "section lines," surveyor's boundaries which run at right angles over mountains, valleys, forests and hills. Just so, in theory anyway, his Roman counterpart lived on his villa (Weber 1976:309).

The subsequent history of Republican Rome was characterized by the take-over of increasingly large plots by "capitalist entrepreneurs" and their conversion to slaves modes of production. The Gracchan land reforms marked a brief, unsuccessful attempt to stem the tide, but ultimately, "the victory of the landed interest and the violent suppression of the Gracchan movement signified the victory of unfree labor and thereby the destruction of the ancient foundations of the Roman state." By the time of the Social Wars, "the political importance of the peasantry was over" (Weber 1976:321).

Weber's later career would be marked by a greater interest in cities, the city-country divide, and his consequential participation in the primitivist-modernist debates about the ancient economy. It was to his younger contemporary Rostovtzeff, less steeped in the social sciences, without the benefit of a medievalist mentor and strongly impacted by the Russian Revolution of 1917 that left him an exile, that the mantle of large-scale Roman socioeconomic history passed. The long chapter on the Roman colonate which Weber was to draft was given to Rostovtzeff (Rostovtzeff 1910; Bruhns 2005), and with his two monumental volumes on Hellenistic and Roman socioeconomic history, the shadow he cast over the field is a long one. Rostovtzeff's arc on Roman Republican history is somewhat different in its inflection point, but owes a clear, mostly unacknowledged debt to Weber: after a period of Etruscan overlordship likened to feudal conditions, Roman peasants cast off their bonds and form what he terms "the peasant state" (Rostovtzeff 1926:11). The history of the pre-Hannibalic period is the history of this peasant state, and its victories up and down the peninsula and its subsequent colonies. As with Weber, the denouement comes with overseas expansion, which ushers in large scale capitalist agriculture and slaves—both imported from the East. These developments and subsequent land grabs will push the peasant into poverty-stricken tenancy, a state from which they will emerge only with the peasant revolutions of the 3rd century AD, which in turn will bring down the empire.

Much has been made of the influence of Rostovtzeff's own experience during the Russian revolution upon this narrative, even by Rostovtzeff himself, who frequently alludes to studies of Russian peasants in his account. Its embeddedness in the circumstances of its own time (Andreu and Berelowitch 2008), plus its enormous scope, rendered it relatively quickly a white elephant, a massive, unanswerable statement that hovered over the field for generations and now leaves it as the biggest work of Roman social history our students never read (Peachin 2011:3). That obsolescence had a critical effect on the study of Roman peasantry and indeed, it is with Rostovtzeff that we can mark our first "swerve." For the *Social and Economic History of the Roman Empire* was more than the flawed product of the 1917 revolution. It was, rather, a palimpsest—the largest, most readable statement of several generations' characterization of Roman history as a history of the peasantry. For the three generations of scholars whose work marked the origins of the field—Mommsen, Weber, Rostovtzeff—as well as Tenney Frank's (1920) more politically driven survey and even Toynbee's later throwback (Toynbee 1965)—the arc of Roman history turned around the ennobled, doomed peasant figure as the rock of the Roman state and economy. The crisis of the Republic is a post-Hannibalic phenomenon that witnesses the downfall of the peasant at the hands of "capitalist" forces of monocultures at scale run with slave labor. Rostovtzeff's extension of this narrative to the later empire with bands of "red peasants" destroying the empire's cities brings this narrative full circle. He also left little room for alternative explanatory arcs, and historians of the generations immediately following Rostovtzeff were disinclined to attempt either an update or a rebuttal of his picture at a commensurate scale. Therefore, the caesura in social history, and certainly in

socioeconomic history that followed Rostovtzeff, also meant a caesura in this sense of the peasant as an integral part of Roman history.

A different, largely unconnected notion of peasant historical experience emerged from these same revolutionary origins, namely Alexander Chayanov and his studies of the Russian peasants of his own day. An agrarian economist who helped shape Soviet collective agriculture, Chayanov's data-rich studies of early 20th c. Russian peasants posited a distinct peasant economy, and by extension, peasant culture, which avoided engagement with market economies and whose dynamics were largely driven by natural evolutions in internal family labor supply (Chayanov 1966). The clash between Chayanov's ideas and a vision of a dynamic, historically contingent rural labor force led to his execution in the Stalinist purges and to the delayed translation of his works, which did not appear in English until 1966. Nonetheless, following that translation, his sense of a distinct peasant economy and static peasant worldview would have a lasting effect on both ancient history and peasant studies well into the 1990s (Shanin 1990b). Indeed, if Weber and Rostovtzeff sought to connect the ancient and modern worlds through the shared historical arc of peasant decline, Chayanov's peasants bridged the ancient-modern chasm because they were, in a sense, the same people, unchanged by history. Bortolotti's photo of the Pontine girl (Fig. 1.1), emblematizes this Chayanovian vision of timelessness.

These late 19th and early 20th c. Roman and Russian agricultural histories may have rested foursquare on constructed ideas about around the peasantry and contemporary arguments about their place in society. But the implicit anchoring of these studies in their own present meant that they did not amount to reconstructions of the history of Roman peasants that acknowledged the perspectives or experiences of the peasants themselves. Indeed, the historical turn towards bottom-up histories is a post-war phenomenon (Hobsbawm 1988:269). The socio-anthropological effort to characterize the peasantry, self-defined "peasant studies," that engendered the lively theoretical debates to which we alluded earlier, is yet later, mostly a product of the 1960s–1980s (cf. Bernstein and Byers 2001). It is in these moments we might have expected Roman history to have returned to peasants as a major problem. The fact that it did not marks a second, more fundamental swerve.

Two main strands of historical thought constituted roads-not-traveled for Roman historians. The so-called Annales school in France and new branches of Marxist history in Britain reframed the historical enterprise in most fields. The Annales particularly, with medievalists such as Marc Bloch and George Duby, pushed pre-modern history into new territories, with its emphasis on multi-scalar histories that embraced quotidian, particularly rural, experience as much as the episodic *événement* histories of great men (Duby 1962, 1973). Indeed, the master works of the founding generation of Annales—Bloch's 1931, *Les caractères originaux de l'histoire rurale française* and his great three-volume work on feudal history—laid out the pre-modern historian's task as a ground-up enterprise (Bloch 1931, 1939–40).

It is worth noting, given the sometimes explicitly non-Marxist character of the Annales projects and the later, more cultural "mentalité" tracks it followed, the tacit debt Annales owes to Marxism. As Eric Hobsbawm (1997) later observed, the whole notion of a bottom-up history, whose early rallying cry called for integrated socioeconomic history, would have been impossible without Marx. In their overt beginnings from Marxist principles and their resultant different trajectories, the British Marxists of the post-war period therefore mark an allied, but distinct trend. Hobsbawm, Rodney Hilton. and E. P. Thompson—all of whom advocated "history from below" as part of either explicitly Marxist or non-Marxist historical agendas and some of whom were careful readers of Bloch and Braudel as well—together produced a burgeoning study of the under-classes, from Hilton's pioneering work on the village life of medieval English peasants to Thompson's history of the English working classes including peasants (Thompson 1963; Hobsbawm 1964; Hilton 1975).

Similar, largely unacknowledged, Marxist influences saw the somewhat later advent of "peasant studies," whose Anglo-American disciplinary base was as much socioanthropological as historical. Eric Wolf's *Peasants*, published in the same year Chayanov's work was first translated into English, emblematized the productive tension that would fuel the flourishing of the field; were peasants an essential category characterized by unchanging internal economy, or were they part and parcel of the historical process of socioeconomic differentiation (Wolf 1966; Friedmann 1980; Harriss 1982; Shanin 1990a)? These

debates played out in the *Journal of Peasant Studies*, begun in this same period, where articles addressed a range of historical periods and places, drawing on the resources of history, cultural and economic anthropology, and various area studies (Bernstein and Byers 2001).

These developments took some time to have any impact on the field of Roman history and, when they did, no groundswell of interest in the lower classes in general or in peasants in particular was forthcoming. Moses Finley, Paul Veyne, and Peter Garnsey represent partial or potential exceptions, the respective Marxian, Annales and peasant-studies inflected strands of Roman histories that would emerge in the 1980s and 1990s. While Garnsey in particular would take up the problem of peasants on occasion, none of these scholars would initiate anything like the bottom-up history fomenting in other disciplines. How these scholars encountered and departed from bottom-up history marks the somewhat longer story of our second swerve.

It was Finley who re-energized the study of the ancient economy after the post-Rostovtzeffian caesura. While his own Marxist leanings ultimately led to his departure from America (Harris 2013b), and his early work in the US dabbled with land tenure and agriculture (Tompkins 2016), Finley never took up either peasants or bottom-up history in the manner of his fellow British Marxists in other fields. Finley's 1973 *Ancient Economy* instead returns to the primitivist-modernist debates of the late 19th century and under the influence of economic historian and theorist Karl Polanyi, reframes the ancient economy as a socially embedded enterprise, inseparable from display, reputation management, and cultural sensibilities. By adopting a "substantivist" position, as opposed to the "formalist" distinction between economic activity *tout court* and the rest of an individual's or society's social and cultural praxis, Finley paved the way for later scholars to fuse these two complementary, yet analytically separable binaries: primitivism vs modernism, on the one hand, and substantivism vs formalism, on the other (cf. Saller 2002). Such a blurring has created a considerable amount of analytical confusion, because, unlike his 19th century counterparts, whose arguments were in part rooted in a desire to weigh in on the question of Marxist-inspired primitive collectivism, Finley's substantivist statement integrates his own earlier preoccupations with legal categories, Weberian ideas of "status", and Polanyi's reciprocity, redistribution and market type economies (Launaro 2016). His preoccupations, therefore, are with the macroeconomic structure and its embeddedness in cultural norms: the modes, and above all the agents of production are of secondary importance. Thus while Finley brought economics back to the fold of Roman social history and returned to some of the Marxist-peasant-driven debates to do so, he did so in a way that shed the underlying concerns about people and property that motivated those early debates in favor of new trends in historical economics. The result was new life for the study of ancient economies, but in a very specific direction: the structure of urban versus rural economies, the nature of taxation and the scale of trade (Hopkins 1980). The people implicated in these structures and processes, however, were shunted aside.

The timing of Finley's work, particularly in an Anglo-American classics context, also meant that the study of the ancient economy, and peasants along with it, fell rather quickly out of vogue. Classics generally, and with it ancient history, soon became part of a broader literary turn ushered in by French literary and historical theorists, in which the critical examination of the text qua text, a skepticism about its factual claims, and an interest in the cultures of its production, all left Finley's brand of socioeconomic history rather in the lurch. Ancient economic history fell somewhat by the wayside, and subalternities defined by characteristics other than economic status—gender, race, sexuality—took the place of peasants at society's margins (Morris 1999: xxiv–xxv).

It is equally noteworthy that none of the founding Annalists were Romanists and that subsequent generations of French Roman historians never followed along the lines laid out by Bloch or Duby. Paul Veyne may be the closest: never an economic historian, Veyne moved between the later Annalists' interest in *mentalités*, and a Foucaultian turn towards the constitutive aspects of practice as applied to Roman social structures. His work on Roman lower classes (Veyne 1976, 1990) and his contribution to Aries and Duby's *Histoire du Vie Privée* (Veyne 1987) share an interest in non-elites and a metastructure of legal and social category (*plebs*, slaves, women) inflected with a sense of their quotidian praxis (euergetism, marriage). But Veyne's world, like other French social historians of the period, remained resolutely urban

(Gagé 1964; Chastagnol 1982; Frézouls 1988). Moreover, and in keeping with broader Roman social history of the time (MacMullen 1974; Alföldy 1975), his reluctance to jettison Roman legal categories as an *a priori* structure for social history leave the "maddening" peasant somewhat outside the brief.

Peter Garnsey's work constitutes the most consistent and largest body of explicit work on the Roman peasantry for the Roman world. Garnsey's work began from the discipline's abiding interest in legal category as basis for class, but quickly extended to studies on diet, ecology and longevity. Significantly, Garnsey also moved beyond the largely text-based approach of the bulk of his predecessors who, with the notable exception of Rostovtzeff, had paid little attention to archaeological data. By combining peasant studies in anthropology and ethnology, with the Annales' interest in environment, Garnsey's work showed a way forward for scholars seeking to recapture the voices and lifeways of the marginal in the Roman world (Garnsey 1976, 1979). Important for our project was Garnsey's use of modern ethnographic and environmental studies to understand regional differences in peasant demographics, and to frame a fragile vision of peasant agricultural sustainability, racked, as he saw it, by constant food shortages produced by the twin exigencies of climate and conservative agricultural practices (Garnsey 1988, 1999). The thread that permitted Garnsey to connect this modern data to Roman peasants was a tacit sense of an essentialized peasantry. Inherited from Chayanov, Wolf, and Shanin, Garnsey's Roman peasants might be subject to imperializing forces but their quotidian realities were those of a Mediterranean peasantry writ long, and thus comparative ethnography from 20th century Greek and Italian peasants could be regarded as fair proxies for their ancient counterparts.

As one of the few Roman historians of his generation to publish explicitly on peasants, Garnsey's work was a major departure point and inspiration for our project. But the underpinning assumptions of peasant essentialism and their intellectual tradition from which that assumption derived became important points of debate within the project. The utility use of modern comparisons for our understanding of ancient peasant lifeways was, therefore, also hotly debated. Ultimately, we rejected ethnography as a viable thread connecting ancient and modern peasantries, and therefore we did not conduct systematic interviews with local inhabitants as part of our project, as have become integral components in the studies of ancient Greek countrysides. Without a ready-made set of comparanda and explanatory principles, we were left to construct the worlds of our peasants from first principles. As a consequence, we also found ourselves questioning, reshaping, or rejecting many of the other assumptions that informed Garnsey's approach. We will have cause to reflect upon this process of questioning throughout this volume, and we return to it more synthetically in the concluding chapter.

In Italy, a more sustained, if less methodologically innovative approach to peasants was carried out by Marxist historians and art historians, launched in part by Gramsci, whose need to wrestle with the reality of contemporary Italian peasant issues forced him to rethink Marx's own assumptions on the issue and to carve out a place for rural workers in the history of proletariat revolution (Gramsci 1920; Carandini 1979; Davidson 1984; Terrenato 2005). Italian Marxist historians continued to be interested in the 19th c. decline-and-fall model of rural peasants, arguing over the narrative of capitalist villas eliminating—or not—small freeholders (Levi 1976; Schiavone 1979). It is important to note that the real interest of Italian Romanists, however, lay less with peasants and more with slaves and a Marxian "slave society" (Cicciotti 1899; Capozza 1966; Shtaerman 1975; Carandini 1988). As a consequence, it is the mechanics of so-called slave villas and agriculture and their relationship with small freeholders that occupies so much of the monumental edited volume on Roman social history—*Società romana e produzione schiavistica* (Giardina and Schiavone 1981). The first scientific excavations by an Italian of a Roman site in Italy at Settefinestre were likewise attempts to make sense of Roman history as slave history (Carandini 1985). A presumed top-down power dynamic between slave and free systems are the abiding heuristic of these studies: that is, this literature is largely concerned with the mechanics of oppression. The bottom-up narratives of British Marxists in other disciplines, particularly medieval studies, is largely absent here. In an Italian context, our project thus frequently found itself on awkward footing, its commitment to describing peasant lived experience clashing with the expectation that we would produce an interrogation of power relationships.

Yet just before Italian Roman historians swerved away from peasants to slaves, Italian medieval and modern historians and the general Italian public would elevate peasants to the level of national history. The Bortolotti photograph with which we began this chapter is an earlier precursor to this popular peasant renaissance. The land reform movements of the 1950s, which broke up great estates in Tuscany, Puglia, and elsewhere and reassigned small plots to smallholders, constituted a powerful, if short-lived moment of peasant identity-crafting and activism, in which land itself was redefined around labor—"la terra è di chi la lavora" (Ginsborg 2003: ch. 4; Gaggio 2017:64–109). These movements, combined with the European resurgence of peasant studies, resulted in a flurry of historical and cultural work on local peasant life (e.g., Gori-Montanelli 1964; Martinelli 1976; Mirri 1979; Giorgetti 1983), and the foundation of hundreds of museums dedicated to *civiltà contadina* or *civiltà rurale* throughout the country and especially in provinces with strong land reform movements (Gaggio 2017:219–239). This "peasant moment" created huge archives of photographs, peasant diaries, and material culture, not to mention a voluminous secondary literature which situated it firmly in its local historical contexts. As much of this data was additionally local to Tuscany, it constituted a massive and seductive potential data set for our own project. As we have signaled above and will discuss in more detail below and in Chapter 3, we opted deliberately not to use it.

The third and final swerve away from peasant economies has taken place as part of the last decade's renewed interest in the ancient economy. Largely predicated on a rejection of Finley's primitivism, the adoption of cliometrics as a means of generating and analyzing large data sets, and the use of so-called New Institutional Economics (NIE) models of economic behavior, this turn has not, interestingly, produced anything like a renewed interest in peasants or the lower classes. On the one hand, the willingness of Roman history to return to economic history and the desire to move from case-studies or ethnographic data to data from ancient contexts, mesh well with the aims of any project like this one proposing to use big data to pursue socioeconomic questions. The quest to quantify Roman per capita GDP (Temin 2006; Lo Cascio and Malanima 2009; Scheidel 2009; Scheidel and Friesen 2009; cf. Capogrossi Colognesi 2009) and inequality (Scheidel and Friesen 2009; Flohr 2017; Scheidel 2017) is of great interest to our own efforts to understand peasants' relative levels of wealth. On the other hand, much of this work's New Institutional framework has framed "the Roman economy" as a set of questions about trade, urbanization, industrialization, and taxation in which the state as institution *par excellence* sets the boundaries for economic performance (Scheidel, Morris, and Saller 2007). Labor in general and peasants in particular are largely eliminated from this model and even agriculture gets short shrift (Kehoe 2007, cf. Kron 2012a). In part, the disconnect between a historiography predicated on peasant essentialism, and a neoclassical economic history preoccupied with growth, is to blame. Some of this work has provided a useful framework for our own data, particularly its explorations of agricultural productivity and the nature of urbanism in central Italy (Kron 2000, 2002; Bowman and Wilson 2011). Much has been equally useful as a foil, its image of an urban, trade-based society opposed to our argument for rural labor as standing at the heart of the Roman world project, and its periodization of a state-driven "Roman economic miracle" over the course of the late Republic through the high empire stands starkly at odds with our evidence for boom-bust economies that fail to match up with state-based histories.

Ironically, contemporary work on peasants in all periods, both in a more neoclassical vein and in development economics, economic anthropology, and history, has largely moved away from the assumption of universal peasant essentialism in favor of more variegated, heterogeneous peasantries whose experiences and economies are embedded in their local contexts. New work has emphasized the myriad ways in which peasants in different places and periods interact with markets, including the labor market, global trade, small craft production, urbanization, and other forces of market economies (Akram-Lodhi, Haroon and Kay 2010; Chang, Huang, and Chen 2012). This work has also tended to break down the assumed equation of "peasant" with rural smallholder, demonstrating the overlap between smallholders, tenants, wage laborers, and craftspeople, while strands of Marxist scholarship have sought to equate slavery, smallholding, and wage labor (Banaji 2003; Narotsky 2016). The break-away of the *Journal of Agrarian Change* from the *Journal of Peasant Studies* can be seen as

emblematic of these new directions (Bernstein and Byers 2001). This new work has had a fundamental impact on our project, particularly as we struggled to make sense of our peasants' interactions with local and global forces.

1.3 Historiography II: Archaeology and the Peasant Swerve

Archaeology's potential contribution to the study of rural non-elites is enormous. The textual corpus is lacunose and derived almost exclusively from elite perspectives. No such limitation exists for the interrogation of the material culture. Indeed, new, large scale, big-data projects from Britain and France have made ever more apparent the fact that the majority of Roman material culture in many parts of the empire is peasant material culture, the millions of small rural sites vastly exceeding the remains of cities and elite villas (Reddé 2016b; Smith et al. 2016). And yet outside a couple of notable exceptions and some encouraging new developments, classical archaeology has remained focused on the same elite world that drove its antiquarian beginnings. Unlike medieval or prehistoric archaeology, it has no major strand dedicated to the material culture of non-elites. As often has been remarked, classical archaeology, far more than its sister disciplines, has remained shackled to classical texts and text-based histories (Dyson 1981, 1993). The fact that it never forged its own path towards "bottom-up" histories is thus hardly surprising. The paths that have taken it closest—particularly landscape archaeology—are naturally those which have most impacted this project. And yet, our project diverges from and contests these strands in important ways.

Like the complementary traditions of peasant studies outlined in the previous sections, landscape archaeology presents a diffuse and heterogeneous inheritance for scholars interested in capturing rural lifeways. Landscape archaeology in Italy was pioneered by the British and, therefore, not initially inspired by the approaches of the Annales school, but rather by William Hoskins's canonical and nostalgic *Making of the English Landscape* (Johnson 2007). As such, John Ward-Perkins's South Etruria Survey was, in the first instance, aimed at documenting the long-term human and environmental history of a world being destroyed by industrialization (Smith 2017). The Annales paradigm made itself felt in later British projects, such as the Biferno Valley (Bintliff 1991; Barker 1995;), while the surveys around Cosa were inspired in part by the slavery-oriented Italian Marxist narratives of Settefinestre, with the further goal of making sense of non-slave local settlement (Carandini et al. 2002).

The South Etrurian Project deserves particular mention here, because of its status as the first large-scale systematic survey of Roman Italian landscape, the physical support it ultimately lent to narratives about peasant decline in the late Republic, and the fact that, unusually for landscape projects of its time, it combined surface survey with excavation. As the first of its kind, the South Etruria Project would pioneer methods in Italy common to the discipline as practiced elsewhere. The emphasis on the site as the unit of exploration and analysis and the hierarchical categorization of sites into not only units of different size, but also functional types derived from Latin texts (villa, farm, etc.), would set the trend in Italian landscape archaeology for decades to come (Potter 1979:122; cf. Rajala 2006; Witcher 2006b; Rathbone 2008). Most significantly, the assumption that the size categories of surface scatters corresponded in some way with textually known functional types paved the way for direct comparison of survey data with textually based narratives. The South Etruria Survey was animated by an interest in cataloguing the full spectrum of rural sites, large and small. It was also subject to the exigencies presented by modern development which encouraged excavation in front of the bulldozer. As a consequence, the South Etruria Project actually excavated and studied two peasant sites. The first, Monte Forco, was tentatively identified as a colonist's farm, a product of Caesar's land allotments to veterans in the area (Jones 1963). The second, a small house at Vallelunga, remained unpublished (Potter 1979:123). Monte Forco was an important comparative site for our project, even as the methodological precepts of the South Etruria survey overall proved problematic.

It is important to note that the South Etruria Project did not explicitly embrace a "bottom-up" perspective, nor was it focused on peasants as a social category. Jones's publication of Monte Forco stopped short of using the term "peasant" at all, while Potter's final publication of the South Etruria Project pointedly declined to discuss the sociopolitical

implications of its data (Potter 1979:125–133). Thus, it was not so much the South Etruria Survey itself as the expansion of survey projects based on its textual/site-based model, plus the excavation of the allegedly slave-based villa at Settefinestre and the survey around it in the 1970s and 1980s, that pushed Italian archaeology towards a more explicit focus on relations of power and labor (Carandini 1985; Carandini et al. 2002). The emphasis on the site as analytic unit, an approach that used spatial relationships as proxies for social, economic, or other kinds of hierarchies, and a tendency to ascribe functional designations to differently ranked sites, became the operating principles of the major surveys that proliferated in Italy in the 1980s and 1990s (Witcher 2012). Italian landscape archaeology thus constituted an important prop for extant historical narratives about social hierarchy and class. Indeed, a 2011 book on *Peasants and Slaves* uses field survey data to return to the same questions posed by Beloch, Weber, Rostovsteff, and Toynbee and their interlocutors about the nature of labor in rural Italy during the post-Hannibalic period. In the light of more recent contributions to the demographic and politico-military trajectories of the period, this study came down firmly on the opposite side of the debate, arguing against widespread decline in numbers of free peasant proprietors. Significantly, however, the assumption that it is the fate of the noble but doomed peasant in this period that needs to be explained remains largely unexamined (Launaro 2011).

The assumption that specific kinds of small sites could be interpreted unproblematically as evidence for the existence and activities of peasants, and a preoccupation with hierarchy and class to the exclusion of other questions, has, ironically, allowed Italian landscape archaeology to ignore any deeper questions about peasants—their physical lives, agriculture, or economies. This lacuna is even more notable when one considers that ample ethnographic data was being generated on modern Italian peasants just prior to the explosion of Italian field surveys. That is, while in English-language scholarship the disparate strands of political histories, comparative method, and practices of landscape archaeology were combined, if only fleetingly, into a single project, in Italian scholarship they have remained largely separate.

Landscape archaeology in Greece has a different history, one which was far more interested in the lived experience of rural dwellers, but which relied heavily on the region's abundant ethnographic work, and thus forms another important influence on this project. By contrast with the traditions of landscape archaeology evolving in Italy, the major British and American surveys of the 1980s and 1990s at Melos, Methana, Boeotia, and elsewhere rigorously interrogated the relationship between surface materials and site function, often jettisoning the site entirely as a reliable unit of inquiry and returning to artifacts and the depositional and post-depositional process that produced them (Renfrew and Wagstaff 1982; Mee and Forbes 1997; Bintliff, Howard, and Snodgrass 2007). The relationship between surface and subsurface archaeology, and between modern plowing regimes and surface data, as well as the reliability and repeatability of survey were all debated and tested (Haselgrove, Millett, and Smith 1985; Bintliff and Snodgrass 1988; Alcock and Cherry 2004). In addition, these surveys often carried out ethnographic studies on both living populations and archival sources as part of their work (Wagstaff and Augustson 1982; Forbes 2007). The resulting narratives tended to allow a greater space for peasants and their agricultural regimes in the arc of history than did their Italian counterparts. That role was, once again, predicated upon a presumed thread that connected modern and ancient peasant experience. That is, a Chayanovian essentialism runs through much of this work. Gallant's study of ancient peasant risk strategies, Halstead's work on small-scale Mediterranean agriculture practice, and Forbes and Foxhall's influential studies on grain and storage all, in different ways, are predicated upon assumptions of an enduring, unchanging peasantry in order to make their arguments (Foxhall and Forbes 1982; Gallant 1991; Forbes and Foxhall 1995; Halstead 2014).

Recent work on Italian landscape archaeology is addressing many of the problems outlined above. New skepticism about the functional designations for surface scatters has begun to both disencumber the field of its historical certainties and reimagine the Italian Roman landscape as being populated by more than peasant farms and aristocratic villas (Witcher 2006a, 2006b, 2012; Rathbone 2008; Haas 2012). Artifact density surveys in the Pontine region, for example, combined with robust land use modeling, have shifted attention from enumerating numbers and types of sites to an evaluation of the occupation and exploitation of the land in its totality (Haas

2011). Most welcome from our perspective is the acknowledgment of the limits of surface data generally, and the integration of excavation as an integral and complementary part of the practices for evaluating landscapes. New work has systematically interrogated the relationship between surface, subsurface, and stratified remains (Millett 2000; Attema and Schörner 2012; Schörner 2012), while some surveys, notably Terrenato and Motta's survey of the Cecina Valley and the survey by Ghisleni upon which this project is based, include excavation of type sites as part of the project (Terrenato and Ammerman 1996; Camin and McCall 2003–04; Ghisleni 2010).

The potential of excavation to illuminate the lives of the Roman peasants is on striking display outside of Italy, in the huge datasets emerging from British and French rescue archaeology. The changes in those country's heritage laws that essentially made construction companies a partner to research archaeology have resulted in not only large-scale excavation but the environmental and artifactual studies to accompany them, most of which is publicly available in digital form. The Roman Rural Settlement Project, the Fields of Britannia project, the ERC project Rurland, the Association du Monde Rural Gallo-Romain (AGER) have all made use of these datasets to reveal in rich detail the importance of rural smallholders to those provinces' Roman history and have begun to use to these datasets to examine aspects of peasant experience, particularly agriculture (Smith et al. 2016; Rippon, Smart, and Pears 2015; Reddé 2016a; Favory and Vignot 2003; Lepetz and Matterne 2003; Leveau et al. 2009, respectively).

In Italy, meanwhile, new projects are beginning to turn classical archaeology's attention to the lived experience of non-elite populations, especially in urban contexts. The Porta Stabia project at Pompeii has undertaken the excavation of an entire non-elite *insula* composed of shops and small apartments (Ellis and Devore 2007). A similar project at Morgantina is seeking to do the same for a Hellenistic and early Republican neighborhood (Walthall forthcoming). Field survey data is being re-examined for its potential to illuminate not just landscapes, but also non-elite lives and their role in the formation of Republican Italy (Samuels 2019). The examination of a refuse-filled drain from a mixed-class insula at Herculaneum has shed light on the diets of wealthy and poor alike (Rowan 2016). Unlike the large-scale, rescue-based projects cited above, these ongoing projects were explicitly designed to interrogate non-elite lives, to begin a Roman archaeology "from the ground up." To date, these projects have been largely single-site efforts: the larger scale, process-driven efforts like those in northern Europe do not yet exist. As a project which aimed to bridge the "thick" data of these individual site case studies and the "thinner" data from field survey, our project sought to address this gap (see further Chapter 3).

1.4 Project Questions and Hypotheses

The Roman Peasant Project was a product of the above intellectual traditions, undertaken by a group of scholars whose points of intersections with those traditions were markedly different. The project's founding questions thus reflect the heterogeneous training and intellectual trajectories of its cohort, gathered around a shared mission but engaging with it in different ways. What follows then is a loosely prioritized set of questions and hypotheses, differently emphasized by different members and thus by the project at different times.

1. Can Roman peasants be located and excavated?

This was a question stemming from a debate among field survey archaeologists as to the meaning of the most ephemeral surface scatters (Bintliff and Snodgrass 1988; Schofield 1991; Francovich, Patterson, and Barker 2000; Pettegrew 2001), and therefore related also to the question of the relative wealth of peasant material culture (Witcher 2008; Witcher 2011). Were Roman peasants in fact so poor that they remained untouched by the massive upsurge in material culture evidenced from the mid-Republic onwards, and were they thus archaeologically almost invisible (Rathbone 2008)? If they *could* be located archaeologically, which peasants? Could archaeology discover only the upper end of the peasant wealth spectrum, or were all rural dwellers materially visible? (cf. Foxhall 1990; Rathbone 2008).

Hypotheses: We proposed that using the combined tools of field survey and geophysics some, if not all, of the peasant spectrum could be successfully

located and excavated. We supposed that the Roman cultural preference for stone architecture, tile roofs, ceramic vessels and the like was a broadly shared one, and that even the poorest rural dwellers would leave some material traces.

This did not mean that all such remnants were visible at the surface all the time: the effect of plowing on subsurface-surface relationships had demonstrably shown that even larger sites might be invisible at certain moments of the modern agricultural cycle (Terrenato and Ammerman 1996). We were not, however, interested in testing the artifactual relationships between stratified, subsurface and surface remains, and thus our project was not designed to contribute to the debates about visibility.

We therefore used the results of a contemporary intensive field survey in the *commune* of Cinigiano, province of Grosetto, southern Tuscany, as the basis for our investigations (see Chapter 3 below). The survey was carried out by one of the authors of this volume as part of the larger *Carta Archeologica di Siena* mapping project (Ghisleni 2010). Our project excavated eight sites from that survey, ranging in size from less than 0.25 ha to 2 ha and from the 2nd c. BC through the 5th c. AD, with the aim of demonstrating that large and small scatters alike could be successfully interrogated for information about peasant life.

2. Where did Roman peasants live?

For some of the team this open-ended question was a sociohistorical one, for others, a question about the functional definitions operating within landscape archaeology. Peter Garnsey's eponymous article (Garnsey 1979) posited two locations of peasant homes: dispersed farms on the one hand, or agglomerated village houses on the other. He ascribed the difference between the two to regional factors still visible today as southern Italian peasant villages and the dispersed central/northern Italian peasant farms. Leaving aside the ethnographic evidence underlying this argument (much of which is problematic), the question seemed to us an important one: did Roman peasants in our locale live singly, in agglomerated settlements, or both?

Broadly speaking, Italian field surveys have presupposed that the former model dominates—namely, that the smallest surface scatters represent peasant houses and that such houses were located singly in the landscape (cf. Witcher 2012). Slightly larger scatters are often identified as "fattoria" in such surveys, including the survey we used for this project. *Fattoria* is a hard-to-translate, historically laden term for "farm," which tends to assume a somewhat larger, more complex entity with outbuildings. For some archaeologists these are larger versions of peasant holdings, while for others they already verge on elite market-oriented entities (Witcher 2012; cf. Cambi 2002). Together, these dispersed houses are thought to dominate most central Italian landscapes and are the hallmark of Roman settlement. Finally, large (1 ha+) scatters, sometimes documented as being composed of multiple scatters clustered together, are typically identified as "villages," the multiple scatters assumed to represent individual houses. Such villages form part of most central Italian surveys, often thought to be more prevalent in inland "liminal" areas where they are observed to have greater longevity and stability (Carandini et al. 2002; Cambi 2004).

These models have only occasionally been tested by excavation. One site from the South Etruria survey, two from the Albegna valley survey and two from the Cecina valley survey have been excavated (Jones 1963; Attolini et al. 1982; Perkins and Attolini 1987; Camin and McCall 2003–04; Motta, Camin, and Terrenato 1993, respectively) along with a handful of other small sites located under rescue conditions (see Chapter 12 below). The functional and morphological assumptions underlying the interpretation of surface scatters have very little in the way of excavated data to support or challenge them.

Both the historical and the archaeological literature have assumed that such presumed non-elite sites existed in some kind of dependency relationship with larger villa sites (e.g., Launaro 2011). In asking where peasants live, therefore, that literature has also simultaneously interrogated a set of spatial relationships for information about power and hierarchy in the manner of Italian scholarly traditions outlined above. While we were not interested in these relationships as a matter of priority, in locating and excavating peasant houses of different wealth classes, we would also need to examine where such houses sat vis-à-vis potential sites of power, particularly the one villa in our survey area.

Hypotheses: Following the broadest interpretations from field survey and embracing the functional

designations from the field survey used by the project, we assumed that the range of scatter sizes represented peasants of different wealth levels, the small (100–500 m^2) scatters being the houses of poorer peasants, the larger (500–1,500 m^2) "fattorie" being more wealthy ones. We were also determined to excavate a scatter identified as a village.

We assumed, together with both the historical and the archaeological literature, that such scatters represented mostly houses, that is, a central unit of peasant life where peasant families spent the majority of their time eating, sleeping, processing crops and storing them. We wanted to understand the architecture and spatial configuration of these houses. The handful of earlier excavated sites identified as peasant houses (see Chapter 12 for more detail) were one-room affairs with hearths and yards, but few other recognizable features; we wanted to expand this corpus and interrogate a fuller dataset.

We also hypothesized that the spectrum of peasant wealth might be related to spatial proximity to the Roman villa. We were thus determined to excavate a set of sites nearer to and further from that villa.

As will become apparent in the following chapters, and as evaluated at length in Chapter 5, most of these original hypotheses were probably wrong. The smallest scatters did not reveal peasant "houses" but short-term agro-artisanal spaces, and the very term "house" concealed a number of modern assumptions few of which were applicable in a late Republican context. The reconstruction of the San Martino site with which we began this chapter (Fig. 1.2) is a graphic representation of these mistakes of both theory and method.

3. How did Roman peasants live?

This question encompassed a set of queries about Roman lifeways. We were interested in defining the nature of peasants' architecture, their diet, agricultural practices, and engagement with different kinds of economic practices, including the use of coined money, access to consumer goods, purchase of traded comestibles and production and consumption of crafts. We were also interested in how peasants moved through and therefore made spatial sense of their landscape as related to these other activities.

Our framing of "lifeways" was heavily biased towards production and economic issues: while we hoped, particularly by examining movement, to discover something of non-productive practices, we did not specifically set out to examine religious practices, leisure, aesthetics, etc.

Hypotheses: We supposed that peasant lifeways would vary along a spectrum of wealth and that Roman peasants therefore had a variety of lifeways. Following the recent peasant studies literature outlined above, we hypothesized that these lifeways would be broadly congruent with Roman society writ large and that for many spheres of activity we would not find a specific "peasant" set of lifeways that were measurably distinct. However, we did assume that the locale itself would condition lifeways in significant ways and thus practices would have a "glocal" quality (Robertson 1995).

While the hypotheses around non-essentialization and glocalism were largely born out, our attempts to locate a spectrum of wealth/status would, ultimately, be confounded by the mistaken notion of the "house," outlined above. Rather than excavating a series of typologically equivalent sites varying along a spectrum of economic inequality, we wound up excavating entirely distinct, incomparable sites which, while revealing entirely new information about peasant prosperity, did not readily contribute to a discussion of the wealth spectrum.

4. What was peasants' relationship with their locale?

As will be discussed in detail in Chapter 3, we used the concept of "locale" as a heuristic to examine human-environmental relationships. We were interested in how peasants adapted to, confronted, and changed the land they lived and worked; how their movement through the landscape was simultaneously topographically, economically, and cognitively conditioned; and how plant and animal landscapes overlapped with and were distinct from human landscapes.

Hypotheses: The concept of locale already contains within it the assumption of a human-environment matrix (cf. Agnew 1987). We wished to avoid the presupposition that the environment was simply a backdrop for human activity, and assumed, rather, that the two existed in an entangled, dialectical relationship.

Despite this original hypothesis, we still tended to assume that certain aspects of peasant lifeways (e.g., agriculture) would be shaped more by environment than others. How ingrained that tacit assumption was, and how little credit we unconsciously ascribed to individual decision making, is again emblematized by our erroneous San Martino reconstruction (Fig. 1.2). As will be discussed at length in Chapter 6, assumptions like the use of rich soils for cereals, as in this image, ran up against real land use, which was often quite different.

5. How poor were Roman peasants?

As described above, insofar as the current NIE-inflected approaches to ancient economic history touch on peasants at all, it is to tacitly ask this question. We wanted to be able to engage with this question and with the particular use of archaeological data to produce cliometric models for wealth/poverty.

Hypotheses: We assumed that the various material from multiple excavations would yield proxy data that might be used to gauge relative levels of wealth. That relative wealth would be internally measured by comparing datasets from peasant sites of different size. This hypothesis was predicated upon the assumption (subsequently shown to be erroneous) that certain surface scatters could unproblematically be identified as peasant houses (see point 2 above).

We were skeptical of the NIE tendency to cherry-pick individual datasets to argue for certain measurements of economic performance (cf. Morley 2014 and Chapter 3). We assumed that these datasets were all part of contingent, complimentary assemblages: faunal data could not be considered separately from botanical or ceramic remains, for instance, because meaning and significance of each component and the entirety derive from their relational qualities. Only when considered together AND within the broader stratigraphic/contextual matrix of the individual excavation would these datasets be properly comparable.

Hypotheses: The different intellectual traditions of the team yielded very different assumptions about relative levels of peasant wealth and how "wealth" would be parsed from material remains. Garnsey's work, a major influence on the project, led us to presuppose a highly vulnerable society that would show few signs of surplus production, very little disposal wealth, and little evidence for animal consumption. Our finds specialists, on the other hand, tended to assume participation in a shared, large-scale Roman material culture and thus a more materially complex, if not materially wealthier peasantry than the Garnsey model might suppose. All of us hypothesized that late antiquity would spell no real change for peasant wealth, contrary to recent decline-and-fall trends (Ward-Perkins 2005).

6. Unaddressed questions

It is important to include among this list those questions that might seem proper to such investigation, but for one reason or another we did not specifically design for, along with an accounting for the lacunae.

While we used surface survey and other remote sensing techniques to do this project, the project itself was not designed to interrogate those methods. The project did not employ techniques that would have specifically interrogated the utility of surface survey as against excavation, such as gridded collection before excavation, or comparison of surface, subsurface and stratified artifacts (Schofield 1991; Terrenato and Ammerman 1996; Schörner 2012). Indeed, from the field survey archaeologist's perspective, the project treated plow zone data cavalierly, removing it with a bulldozer and rarely collecting its finds. As will be discussed in detail in Chapter 2, the project's methods were deliberately crafted to interrogate basic questions about peasant life while maximizing the quantity of data on those lives it could collect.

In the process of excavating eight sites located by surface survey, the project naturally yielded data about survey and its methodological biases. That data, and its concomitant critique of survey's functional categorization, was a byproduct of the project, not part of its design and will be published separately from this volume (Vaccaro forthcoming[a]).

As an attempt to challenge a field's preoccupation both with elites and with early models of Roman peasant decline-and fall, the project was intended as piece of bottom-up history, focusing specifically on the lives of peasants as much as possible from a peasant perspective. It was thus very specifically

NOT designed to test power relationships or to offer another interrogation of the villa-owning elite's exploitation of its dependent neighbors. As one of us has argued, power-driven narratives often miss the largely horizontal relationships that dominate quotidian rural life (Grey 2011). While we did not wholly ignore questions of power—indeed, in a project as economically framed as ours, it would be nearly impossible to ignore them entirely—we did not include these among our framing questions.

Finally, and perhaps most surprisingly for a project which deliberately sought to impact the study of Roman history, the project deliberately left ancient texts aside. A reader will find very few references to the principal standard ancient sources for Roman peasant life, the so-called agronomists, epistolary corpora, papyri, etc. In leaving aside texts, we are not denying that these sources, penned largely by elites for elites, might shed some light on peasant life. Rather, we did not want to assume that they did. The work of Roman historians has, in the absence of large, cohesive archaeological datasets, had to make use of these elite sources and thus had to construct some connective heuristics between elite and non-elite lifeways. Since one of the fundamental aims of the project was to test this connection, we opted to keep texts and material culture separate for the majority of this book. The final concluding chapter brings texts back in and addresses some of the confrontations between these elite "words" and our non-elite "things."

1.5 Volume Outline

This volume presents the results of the Roman Peasant Project in a series of empirical and interpretive chapters. While that project was principally archaeological in nature, this report presents its results in ways that both correspond to and break away from a traditional archaeological monograph. The work is thus divided into two parts: Part 1: Old Models and New Data; and Part 2: A New Synthesis.

Part 1 (Volume 1) sets out the historiographic matrix and project place, methods and results. Following from this largely historiographical introduction, Chapter 2 sets out the project's various methodologies. Chapter 3 is locational: it sets out the concept of locale and describes the characteristics and history of the human-environment matrix that will inform the chapters that follow. Chapters 4 through 11 present the results from the eight sites excavated by the project: each of these chapters acts like a complete site report, presenting the context, remote sensing data, excavation results and all concomitant finds analysis and concluding with a short discussion.

Part 2 (Volume 2) presents a set of analytical results chapters. Unlike the canonical archaeological report where these would be organized by find types, this second section is organized around themes and considers all relevant finds categories synthetically. These themes are the question of Roman peasant "dwelling"(Ch. 12); agriculture and land use (Ch. 13); diet, dining, and subsistence (Ch. 14); non-agricultural production, markets, and trade (Ch. 15); architecture (Ch. 16), and mobility (Ch. 17). Each of these chapters begins with a short assessment of the historiographic status quo pertaining to these themes, while the bulk of the chapter uses the multiple data sets from the project to intervene in that historiography. These chapters are thus intended explicitly to analyze project data as they relate to current debates in the field. For those interested in the detailed finds data, ceramics, faunal, and small finds catalogues are included as appendices.

The book's conclusion takes up the larger historiographic issues presented in the Introduction, addressing the project results to a new vision of Roman peasants and some considerations of how this revised view might impact Roman social and economic history. In particular, it makes two claims. First, it faces square-on the issues of peasant time and timelessness and proposes a reshaping of our most basic assumptions about the temporality of everyday life in agricultural contexts. Second, by emphasizing the particularity of these peasants and suggesting that this particularity is generalizable in time and space, it propounds a firm rebuttal to the notions that there was one kind of Roman peasant, or that the qualities of peasants in other times and other places can be straightforwardly mapped onto Roman peasants. Nonetheless, and as we have argued throughout this introduction, the category "peasant," as a descriptive noun and as a heuristic tool, is both meaningful and fundamental to the project of bottom-up history.

Finally, a brief description and analysis of the community archaeology projects carried out by the project, in collaboration with the town and school of Cinigiano, are described in an Appendix. This work

took a variety of forms and was tailored to the short, fast-paced nature of the work seasons, the desire to return the excavated land to agricultural use, and the particular needs of a modern farming community itself in the grip of major changes.

Despite the avowedly activist intentions of the volume, the lessons of the two images are constantly reiterated. Giving history to a people without it (cf. Wolf) may be a major desideratum for Roman history, but such an enterprise can never fully escape the twin traps of nostalgia and presentism. Indeed, this volume is testament to the challenges we encountered, and the conclusion ends with a detailed consideration of our failings and of the roads that subsequent studies might travel.

NOTES:

1.1 The concept is borrowed from Stephen Greenblatt's eponymous book (Greenblatt 2011). But cf. Grey's (2011) analysis of later Roman rural studies as being characterized by a series of 'slips'—upwards towards aristocrats and sideways towards legal structures.

2

Methodologies

Antonia Arnoldus, Kim Bowes, Stephen Collins-Elliott, Cam Grey, Mariaelena Ghisleni, Michael MacKinnon, James Matheiu, Anna Maria Mercuri, Marco Sfacteria, and Emanuele Vaccaro

The questions that informed the Roman Peasant Project, as outlined in Chapter 1, were five-fold:

1. Can Roman peasants be located and excavated?
2. Where did Roman peasants live?
3. How did Roman peasants live?
4. What was peasant's relationship with their locale?
5. How poor were Roman peasants?

These questions gave rise in turn to a set of hypotheses about Roman peasants which would be tested by the project:

1. Most Roman peasants can be detected archaeologically and variations in their material culture will be representative of relative levels of wealth.
2. Roman peasants in central Italy lived in houses, or houses accompanied by outbuildings (farms) which were mostly distributed singly in the landscape, but also possibly in villages.
3. Roman peasant lifeways were rooted in both local circumstances and global trends, particularly trends in Roman economic life.
4. Peasants' relationship with their locale was complex and dialectical.
5. Peasants may have been vulnerable to risk, but partook of the major developments in trade, technology, and mobility that characterized Roman Italy more generally.

The project was developed specifically to answer these questions and address their concomitant hypotheses. Thus, the project's methods were selected and shaped accordingly. Over the six seasons of the project's life, these methods underwent some variation, particularly as was necessary to respond to the results of the previous season, but they were broadly applied throughout.

Hypothesis-driven methodology is not always either theorized or practiced in classical archaeology. A history of large, typically urban excavation established a kind of "playbook" by which all excavations, regardless of their research goals, were carried out. This has been particularly true of large American projects which have lasted decades and trained several generations of archaeologists to follow a standardized set of methodological practices which in turn are taken to new projects.

As will be outlined below, this project's methodologies borrow from a variety of methodological traditions. New trends that integrate surface survey with both excavation and other forms of remote sensing; rescue excavation as practiced in Britain; and the integration of finds collection and analysis as currently practiced in American survey projects in Greece, are among the most important borrowings, all of which were specifically selected to respond to the project's particular goals and hypotheses. Just as the project's goals necessarily restricted the scope of the project to certain themes while sidelining others, the selection of these methodologies necessarily meant that certain kinds of data collection were privileged over others. The project assumes, along with post-processualist principles, that all archaeological method is necessarily circumscribed both deliberately by the research goals of individual projects and tacitly by the biases and preconceptions of its practitioners. Results are neither neutral nor totalizing but speak to the circumstances of project and people engaged in it. As we have attempted to set out our own historiographical baggage in the introductory chapter, we here lay out the particular methodological precepts and practices that shaped the project.

2.1 Precepts (KB)

Three basic precepts are built into both the project goals and the hypotheses that derive from them. Each of these precepts has important methodological implications that will be generally described below, and further elaborated as they impact each kind of archaeological praxis.

1. Peasant spaces and populations were socioeconomically heterogeneous.

The goal of excavating a range of peasant spaces, and the specific hypothesis that "peasant" actually included a range of socioeconomic circumstances both had major methodological implications for the project. As will be discussed further below in both the field survey and excavation sections, we deliberately selected a range of "sites" from the surface survey we used as the basis of the projects. Although several small scatters, labeled as either "habitations" or "off-sites" were excavated, we also investigated medium and large scatters to unpack not only the various possible meanings of scatter size, but also a range of spaces in which lower-class rural dwellers may have lived and worked.

Although the project drew heavily on a field survey as its basis, and the archaeology of peasants in Roman Italy has likewise been dominated by field survey investigations (see above, Ch. 1), we were not initially interested in interrogating field survey as a methodology. We did not shape the project to test Italian field survey methodology for its reliability in locating and categorizing peasant spaces. Indeed, we accepted the most basic assumptions of this methodology—namely that small scatters or off-site scatters represented the detritus of peasant houses—as the very basis of our study. It was only in carrying out these excavations relying on these assumptions that we came to question them and, thereby, produce both a critique of survey-based functional identification and an alternative set of ideas about the use of Roman landscapes. These results were unanticipated and not built into the project design.

Instead our interest in field survey methodology was quite different. As a project that excavated multiple sites located via field survey, we wanted to bridge the qualitatively thin, but numerically voluminous data yielded by survey and the qualitatively rich, but singular data produced by excavations. Survey data yielded the multiple datasets necessary to track questions of material sameness and difference which themselves were critical to answer questions of homogeneity and heterogeneity, while excavated data provided the material-rich datasets requisite to answering questions of lifeways.

This precept and its correlates both dictated that we excavate as many sites as possible, with as great an accuracy as possible: the more sites, the bigger the data sets, while the richer and more complete those data sets were the "thicker" the descriptions of lifeways we could write.

The quantity of sites we could excavate would be determined by an equation between funding and time. Money and time exist in a direct relationship in archaeology: $X of funding yields Y days of research using M methods. Data quantity Z is similarly a result of =(Y/M). By manipulating M—our field methodologies—we sought to maximize the total data Z we produced on a fixed amount of funding/time. For

reasons dictated by our project goals and hypotheses, we deliberately selected a series of methodologies that would speed excavation, finds collection, and analysis. These will be described in detail below.

2. Peasant lifeways should be central to the study of Roman landscapes.

As discussed in Chapter 1, Roman landscape archaeology has been focused on pattern and chronology to the detriment of people and their circumstances. The project's goals of producing thick descriptions of peasant lifeways, and the concomitant hypothesis that these lifeways were affected by both local and global circumstances, yielded a whole series of major methodological precepts.

The most important of these were choices about the kinds of data collected. Every form of data that had a chance of revealing aspects of behavior or contextualizing that behavior was employed. In addition to the usual collection campaigns for ceramics, coins, and small finds, major emphasis was placed on environmental data, including faunal, botanical, and geological data. Unusually for a classical-period excavation but the norm for prehistoric projects, we dedicated considerable time and resources to pollen, non-pollen palynomorphs, macro- and microcharcoals as well as seeds/fruits, to sourcing all our building stones and producing land-unit maps and to analyzing possible movement patterns throughout the locales.

Other kinds of data that did not yield information on lifeways was necessarily dealt with more summarily. Stratified remains whose chronological and functional context could be better determined were prioritized. The plow soil, in which finds exist without precise contextual qualifiers, was largely ignored. As was noted above, the project was not framed to test field survey methodology or its functional attributions. Had it been, an interrogation of the plow soil through gridded collection of surface finds and test pits at different depths (cf. Millett 2000; Schörner 2012) would have required a major realignments of the project's funding/time/methodology equation. With an emphasis instead on lifeways and behaviors, these activities were eschewed, the topsoil largely ignored, and excavation and finds collection focused on stratified remains.

Finds analysis was also integrated with excavation. Not only were ceramics spot-dated in the field but basic functional analysis cataloguing and drawing of ceramics, faunal and small-finds collections were carried out mostly at the same time as the excavations were on-going. Developed in part as a response to new regulations around field survey in Greece, in part as a product of Çatalhöyük's reflexive methodologies, integrated finds analysis permits the project to respond to finds it uncovers in real time (Hodder 2000; Tartaron et al. 2006). In our case, the all-important finds with their information about lifeways could shape excavations and other analysis as it took place in real time, allowing us to maximize collection in contexts which promised rich data sets or which responded to particular practices. The exception to this integrated finds practice were the botanical remains: while wet sieving took place in the field, analysis of macroremains, pollen, and charcoals took place post-season in the lab. Even in this case, most remains were studied within the calendar year after the excavations took place, so that any new findings could inform the methodologies and decision making in the next project season.

3. The concept of *locale* provides a useful heuristic for examining the relationship between people and landscape.

The interpretive framework for this lifeways data was fundamentally shaped by the concept of the locale. As described in Chapter 3 below, locale offers an alternative to the human-environment binary in which the former either responds to or acts on the later. Rather, a locale is imagined as a human/landscape unit in which all elements from ceramics to plants, trade to seasonal change, take place in mutually implicated dialog(s). Thus, while discrete categories of evidence produced by the project—ceramics, faunal, botanical, small finds, geological—were studied separately, they were also assumed to represent reciprocal activities in the locale. Different land units encouraged particular kinds of agricultural practice as revealed by pollen evidence and faunal finds, while pollen and faunal evidence likewise showed those instances in which soil potential was ignored in favor of other factors. The concept of the locale both encouraged the integration of data sets as well as placing

them on equal, nondeterministic footing. It similarly defined the spatial sphere of action in each site and of the project as a whole by the residues of activities i.e., the finds themselves, rather than by a priori means like Thyssen triangles or buffer zones.

2.2 Archaeology in Roman Social History (KB)

The project proposed to integrate its results with historical discussions to revise, if necessary, a Roman social and economic history which has been largely written without the experience of the lower classes and/or without firm data on their activities. This imperative to not leave archaeological data in the disciplinary realm of archaeology but to use it to write a new kind of history, itself introduced a series of requirements.

The first was the imperative that materially derived histories be analyzed first on their own terms. Histories told with things are different in kind that those told with words. Rather than contesting the relative truth-claims of one or the other, we were concerned that the materially derived histories we told from the archaeology emerge alone first, before being laid against textually derived histories. Thus, in the following chapters outlining each excavation or analysis, the reader will find very few comparative citations with either primary Latin texts or secondary histories. The work of laying these materially derived histories with textual histories is performed instead in the analytic chapters in Part 2. Here we are as attentive to the differences between these histories as we are to the convergences: classical archaeology has too often sacrificed its own particular, and often divergent kind of history so as to converge with textually derived history (Dyson 1981; Terrenato 2002). Particularly when addressing a population whose representation in contemporary texts is both lacunose and biased, we felt it particularly important to view texts and archaeology on separate footings.

The hypothesis that the Roman peasant world was informed by both local and global concerns likewise requires a particular kind of history writing. The concept of the locale into which we insert our data already preferences localness. As has been shown, Mediterranean locales were also particularly particular—topography, climate, and diversity of activities all make individual locales potentially distinct from their neighbors and contribute to their discrete package-like quality (Horden and Purcell 2000; cf. McCarthy 2013). At the same time, these locales were flexible, expandable, and almost always permeable activity zones with the "local" rubbing up against the "external" or "foreign" at every turn. As decades of work on peasant studies have made clear, the isolated, essentialized peasant of Chayanov's histories rarely existed in practice and all peasant societies exist in a complex web of local tradition and trans-local contemporaneity (see above, Ch. 1). If, as we hypothesize, this was particularly true of Roman-period peasants, our histories written with peasants must ride a fine balance between locally determined and globally motivated histories. The analysis of ceramics, of diet, of trade and of architecture all attempt to put our data into this complex web.

Finally, if the "eternal peasant" existed only as a historical fiction, we must assume our Roman peasants to be different in important ways from both their prehistoric predecessors and their early modern and modern successors. As we have noted above in Chapter 1, our assumptions about Roman peasants, many of which are patently untrue and many of which we have set out to check, were strongly conditioned by 19th and early 20th c. historians' observations of contemporary European peasants. It is particularly tempting to make use of this rich and abundant ethnographic material, especially in Tuscany where the region's historians carefully collected and archived diaries and photographs and "peasant museums" exist in many towns. Nonetheless, given its pitfalls and given our project's hypothesis that Roman peasants responded to the particular realities of a Roman Mediterranean empire, we have chosen to use this material with caution. Its principal use for our project was as a lens into the historiography itself, a product of its own time which itself strongly impacts how we as 21st c. scholars understand the meaning of "peasant."

2.3 Methods

In additional to the general precepts outlined above, the project's goals and hypotheses generated particular praxes at each stage of investigation. Many

of these are general methods followed by other excavations/specialists. Some are more unusual or have been modified to fit this particular project and its goals.

2.3.1 Field Survey (MG)

The project derived its initial data from a field survey and remote sensing project carried out by Mariaelena Ghisleni as part of her doctoral thesis at the Università di Siena. Since the project used this survey both as the basis from which it selected the sites for excavation and as the starting point for its examinations of landscape and movement, the methodologies of that project are described in some detail here, while a full discussion may be found in the thesis itself (Ghisleni 2010).

The survey formed part of a large series of landscape studies that comprise the *Carta Archeologica di Siena*. Thus, many of its methodologies were common to that project as a whole and only minimally adapted for this particular project (Salzotti 2013). The *Carta Archeologica* project and personnel were particularly interested in identifying late antique and medieval landscapes, thus, certain practices—both the intensive nature of the surface survey and the use of multiple forms of remote sensing—were applied specifically to this end.

The surface survey used intensive, site-based survey to sample three major areas of the modern *comune* (Fig. 2.1) comprising about 20 km^2 of its ca. 160 km^2 area. Two transects, 3 x 7.8 km in dimension, were identified in the N and S parts of the *commune* and positioned to capture two different geomorphological and presumable settlement zones: the N was placed in an area of modern arable agriculture, abutting the fluvial plains of the Ombrone and the beginning of the Monte Amiata hills. Given the high degree of arable land, it was assumed this would yield high surface visibility. The southern transect was likewise positioned to intersect the Ombrone but also to capture a series of wooded hilltops, where possible medieval settlement had been indicated by aerial survey. A third transect of 4 x 3 km was later added to the N of the northern transect abutting the Orcia River and was set in essentially the same arable landscape.

Survey took place for three successive years (2006–2008) in the later fall/winter—periods of maximum visibility—using four walkers placed every 5 (for low visibility) or 10 (for high visibility) meters. Scatters were documented with hand-held GPS systems that permitted the precise mapping of scatter morphology and easy re-discovery of these scatters at a later date. Individual scatters were assessed by their visibility, density, and artifactual character. Scatters were then subject to collection of representative ceramics and other finds, rather than total collection, and those materials, including roof tiles, were analyzed in the lab, where they were subject to both fabric analysis and morphological dating.

Sites were categorized according to the following scatter size/functional categories, common to the *Carta Archeologica di Siena* project as a whole:

Village: 1.5–2 ha, distinct concentrations of ceramic and construction material and the presence of artisanal installations, for example kilns for tile, furnaces for metalworking.

Villa: 1–3 ha, abundant ceramic material, the presence of luxury architectural remains such as mosaics and columns.

Large Settlement: 1.5–3 ha; spatial and wealth characteristics unclear

Farm (*fattoria*): 500–1,500 m^2; ceramic and construction materials, the presence of storage and/or transport ceramics (amphorae or dolia, for example)

House: 100–500 m^2; ceramic and construction materials, the presence of storage and/or transport ceramics, interpreted as single-family house in small cases

Kiln: identified by the presence of overfired or waster ceramics and/or darkened soil.

Off-sites: were defined as scatters measuring 1.0 m^2 or less, or alternatively somewhat larger but diffuse scatters producing one or two sherds.

As noted above and in Chapter 1, these categories are rooted in a long-standing historiographic tradition. Functional categories have long been and continue to be applied in Italian field survey—a practice that diverges from a general skepticism for such

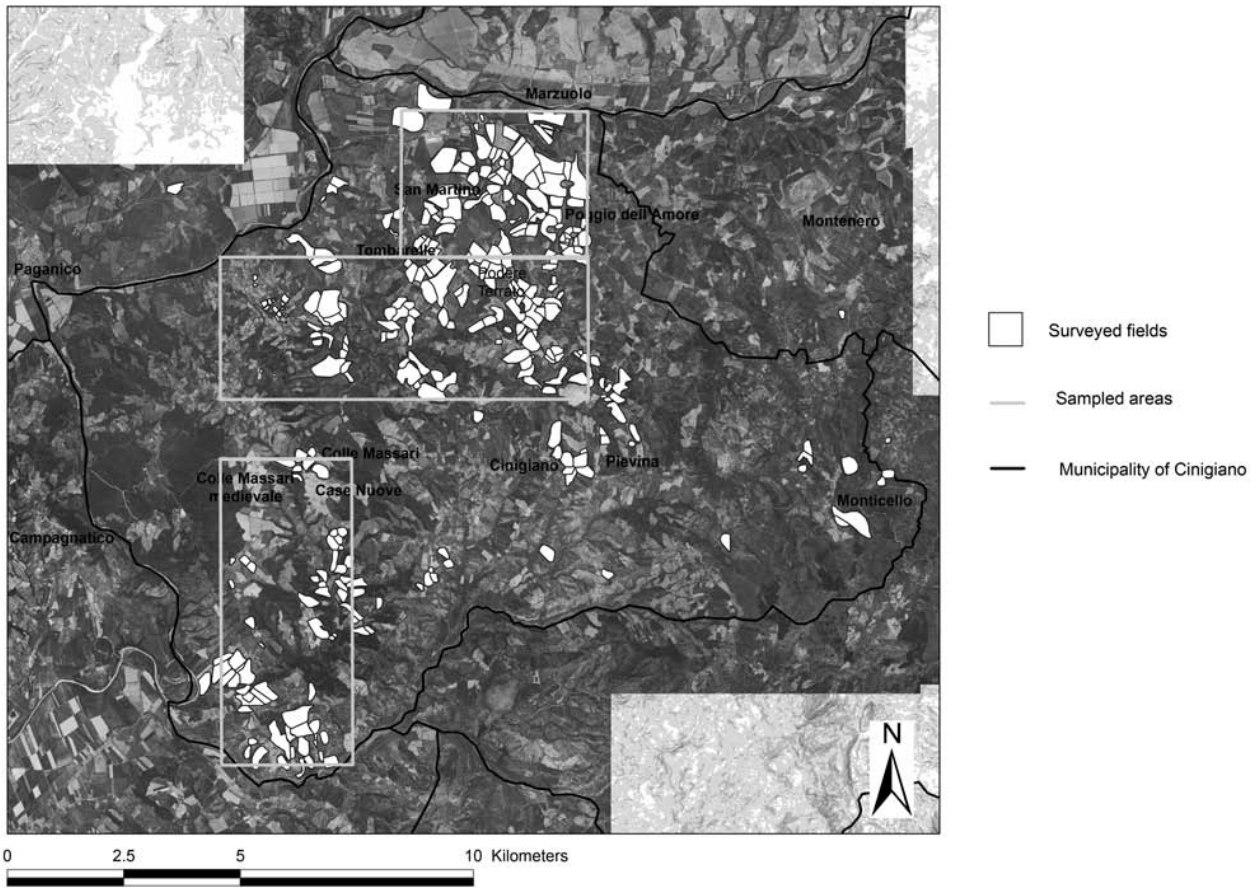


Fig. 2.1 Map of Ghisleni's field survey showing location of sampled areas and surveyed fields (ERZ).

categories in surveys done in other areas of the Mediterranean (Rajala 2006). This is in part due to the use of survey in Italy to respond to specific historical questions, particularly regarding the histories of villa owners versus small proprietors in the wake of Roman political changes and the advent of its global empire (Launaro 2011). Recent criticism has drawn attention to the narrow functional range of these categories, which focus principally on different forms of habitation and conceal a broader functional diversity (Haas 2012; Witcher 2012).

Off-sites are another survey category much debated by archaeologists. The prevalence in some landscapes of very sparse scatters of tile, ceramics or other materials, or solitary sherds in the landscape, has provoked much speculation as to their origin. Scholars have suggested that this phenomenon represents the detritus of manuring practices, the largely destroyed remains of either non-habitation structures, or the poorest, most ephemeral houses—often presumed to be those of peasants (Bintliff and Snodgrass 1988; Cherry, Davis, and Mantzourani 1991:50–52, 472; Fentress 2000; Pettegrew 2001; Haas 2012). The definition of an "off-site" varies from survey to survey, but Ghisleni's definition follows practice common in Italy: scatters measuring 1.0 m or less, or somewhat larger, diffuse scatters producing one or two sherds of ceramics.

In addition to surface survey, Ghisleni's project employed other forms of remote sensing, particularly in its efforts to locate medieval sites. She used targeted aerial photography over a central, NW axis of the locale, directed at six major sites found during field survey, to try to determine their morphology and context. On a selection of three sites already identified by surface survey and deemed of particular interest for their large size and *longue durée* occupation, she also employed gridded surface collection,

geophysical analysis and/or targeted small-scale excavations to produce finer grained data. One of these sites (Marzuolo) was subsequently excavated by the project, while another, the villa of Santa Marta, has been subsequently excavated by other teams.

2.3.2 Site Selection (KB)

The sites excavated by the project were selected from those identified by Ghisleni's survey. The selection process, which involved the input of the whole project team including Ghisleni, considered the following factors:

1. Size/functional category: As noted above, the project determined to excavate a range of scatter sizes to expose the heterogeneity of peasant lifeways and socioeconomic diversity. Size was assumed to reflect in a direct way relative wealth as well as function. Both of these assumptions were found to be both true and false, as will be discussed further below. The project excavated eight sites at most of the size/functional categories used in Ghisleni's survey except "villa" and "large settlement," as follows (see Ch. 3, Fig. 3.2):

   Three 1–4 ha "villages" (Pievina Phase 1, Tombarelle, Marzuolo)

   One "farm/fattoria" (Podere Terrato)

   Five 0.1–0.5 ha "houses" (Pievina Phase 2, San Martino, Case Nuove, Colle Massari TU 359, Poggio dell'Amore)

   Two kilns (included in Case Nuove, Pievina Phase 1)

   One off-site scatter (Colle Massari Romano TU 358)

2. Location/preservation: Mid-slope sites were given preference in all but two cases (Case Nuove, Marzuolo), largely for site preservation issues. Roman sites were preferentially situated on mid-slopes, so there was a large selection to choose from. Mid-slopes tended to have sufficient overburden from run-off to protect the site post-abandonment, but not so much that the surface scatter may have been caused purely from run-off. Sites in this category were Pievina, Colle Massari Romano, San Martino, Poggio dell'Amore and Podere Terrato. Mid-slope sites set in micro-depressions (Pievina, Colle Massari Romano and Poggio dell'Amore) were particularly favored as they would, in theory, capture and contain erosion inside the site basin, keeping materials on the site.

3. Presence of water: In a number of cases, likely sites were located near surface water spots (*fontoni*) and/or subsurface springs. As described above in the description of Ghisleni's survey, she had determined that Roman sites were preferentially located next to such water-rich spots. The problems for excavation, however, were realized at the first site investigated by the project (Pievina) where water was encountered ca. 0.5 m below the surface, ultimately stymieing excavation.

2.3.3 Geophysics (MG)

Once selected, all sites but one (Tombarelle, see Ch. 11) were subject to geophysical analysis. Magnetometry analysis was carried out on all sites, using an Overhauser GEM (GSM-19GW) in walking mode. A very basic magnetometry machine, the GEM, is walked over a grid, laid out over the site, moving across it in 50 cm or 1 m intervals. The data was then processed via Surfer 8.0.

Two sites received further geophysical treatment: Pievina, the first site excavated by the project, was additionally surveyed with a Foerster 4.032 magnetometer, in order to test how two different magnetometers of different generations performed on the same site.

Owing to the huge anomalies produced by the ceramics kilns at Marzuolo and the resultant difficulties of reading the results, Marzuolo was additionally subject to a high-speed, carted form of resistivity analysis called Automatic Resistivity Profiling (ARP). The ARP was carried out by a private company and the results analyzed by the project.

The results of the geophysics analysis varied in each case: magnetometry analysis reveals burning

and as such, registers magnetic anomalies issuing from iron, fired ceramics or bricks, mortar (from burnt lime), and other sites of burning. Disturbed soil and organic decay may register at lower levels. As will be discussed in the individual site sections, in some cases the magnetometry revealed the outlines of walls, the presence of kilns, and overall site morphology. In the case of the smaller sites without tile roofs or mortared masonry, the magnetometry results were characterized by very low level anomalies, chiefly useful for identifying where, within a scatter, lay the most likely location of extant remains.

2.3.4 Excavation (KB, MS)

Once the site had been selected and the verification of extant remains had been carried out with geophysics, the site was excavated with open area, single context recording methods common in British and now Italian practice (MOLAS 1994).

A variety of modifications to these methods were used to expedite excavation to stratified remains. Plow soil was removed with a mechanical excavator (Fig. 2.2), monitored by an archaeologist. In most cases, the depth of contemporary plow had been determined in consultation with the landowners. The excavator removed plow soil until the appearance of more consistent remains, after which it stopped and the area was cleaned by hand.

As the project was interested not only in built structures but also the negative space around these where outdoor activity might take place, large areas, corresponding to the majority of the scatter were opened. When further hand excavation indicated, these trenches were expanded whenever possible to extend well beyond any structures to reveal yards, installations, etc. In some cases (Tombarelle, Marzuolo), the remains were so deep and/or the archaeology sufficiently complex that no time remained to extend the trenches beyond the structural remains.

Once stratified remains were reached, excavation proceeded by hand. Teams were large relative to the sites in question; 10–18 people worked in the field while specialist teams of 5–6 worked contemporaneously on finds processing.

Recording was expedited by a variety of means common to both standard and rescue archaeology, but which changed over the course of the project as different tools were available/affordable. In the first four years of the project, structural remains were laid with either a centimetric GPS or a total station and then drawn by hand. Sections were also drawn by hand.

Beginning in 2013, hand drawing had been partially or entirely replaced by vertical photographs rendered in Photoscan in order to speed the collection of data. We found the fastest processing using 3D image-based photomodeling based on Structure from Motion algorithms (Doneus et al. 2011; Sfacteria 2016). Starting from photographs acquired with a simple digital camera, three-dimensional models could be produced comparable to those obtainable with traditional stereophotogrammetry or with a laser scanner, but faster without sacrificing the necessary precision.

The procedure involved:

1. Collecting the vertices of the excavation and of Ground Control Points in the areas outside the trenches with a total station and centimetric GPS.

2. Orthophotographing stratigraphic units to be documented, usually through the use of a telescopic pole (Fig. 2.3). The distance between the camera and the objects to be detected was changed from time to time according to both the scale—calculated according to the Ground Sample distance—and the area embraced by the picture (Driggers 2003:1391–1392; Andrews et al. 2009). In most cases, we decided to find a compromise between the scale and resolution of the survey and the need to embrace areas of a certain size.

3. Data processing using Agisoft Photoscan, which automatically makes a selection of distinct entities in all the frames, constructs a preliminary list of couples, and resolves the orientation parameters, both internal and external, via an algorithm for spatially defining the various photographic sockets. A polygonal model is generated as a result.

These resulting orthophotos were georeferenced using the vertices previously acquired with a total station and centimetric GPS, so that each stratigraphic unit was documented in GIS as both a shapefile and an orthophoto.

Fig. 2.2 Use of mechanical excavator during excavation of Marzuolo, 2012.

Any object classified as a small find was mapped in using a total station and given a number. Such objects were any non-ceramic object or any object regardless of material of particular significance. Individual building stones were all classified by the project geoarchaeologist and labeled on the site plans, while the location of pollen samples was likewise mapped on site plans and/or sections.

On-site photography of individual features and overall views were conducted as quickly as possible. Thus, while individual contexts were cleaned, backgrounds and sides of the context in question were not, and excavation nearby continued as usual. Site photographs have an "in process" quality quite different from more staged archaeological images.

Single context recording using an Italian modified version of the Museum of London system was used to record individual contexts or "stratigraphic units" (hereafter abbreviated as SU). (MOLAS 1994). Recording was carried out in both Italian and English as chosen by the individual recorder. In order to dedicate more of the budget to excavation and finds analysis, inexpensive paper recording was used throughout the project. Single context records were transferred to an Excel database as soon as they were completed. Neither this SU database, nor the other finds databases were ever structurally integrated into GIS—thus, context and finds information was stored separately from plans and other spatial data. Photographs were also stored separately.

Excavations were typically up to 5 weeks long: small sites like San Martino were excavated in two weeks or less; larger sites used the whole of the five-week season, and Marzuolo was excavated for two seasons. Immediately after excavation was completed, all sites were covered with geotextile and backfilled. This enabled the landowners to put their land back into agricultural use in the next growing season and diminished the tensions that often develop between archaeologists and farmers who see their land co-opted for indefinite periods of time. It also meant that all recording was de facto halted on the last excavation day, forcing closure on the always somewhat arbitrary finitude of data collection.

2.3.5 Ceramics Analysis (EV)

Ceramic quantification and analysis included different levels of detail. Firstly, all the materials from

Fig. 2.3 Use of boom photography during excavation of San Martino, 2010.

each deposit were counted, weighed, and fragments were later divided into ceramic classes. Materials were laid out in order to look for joins. By using the RBH criterion (which means by observing diagnostic sherds, such as rims, bases, and handles) combined with the macroscopic observation of the fabrics (using a 10x magnifying lens) the Minimum Number of Individuals (MNI) per each class in each context was determined. Evaluated vessel equivalent (EVE) was also calculated in cases when the level of breakage depositional processes were important to calculate. Finally, functional typologies were assigned to all diagnostic sherds. Datasets were then entered into Excel, along with a preliminary description of the fabric per each MNI. Each MNI was drawn and drawings were later digitized in Adobe Illustrator.

2.3.6 Faunal Analysis (MM)

All faunal materials were collected during excavation. Wet sieving of selected contexts for botanical remains (see below) also served to collect smaller faunal materials. All identifiable faunal pieces that could be recorded to element and species/taxonomic level were cataloged. Ribs, vertebrae, and miscellaneous long bone and cranial fragments that could not be identified securely to species were grouped according to broader skeletal part and size categories (e.g., rib, long bone, vertebrae, scapula, pelvis, cranium, and "other" bone types for large- (i.e., cattle-sized), medium- (i.e., sheep/goat- and pig-sized), and small-sized taxa and tallied as the 'UNID' portion of the faunal sample. Taphonomic, age, sex, butchery, and metric data were documented where possible. Bone weights were recorded in grams, rounded up to the nearest digit. Epiphyseal fusion parameters follow Silver (1969); dental wear stages correspond to the schemes devised by Grant (1982) for cattle, sheep/goat, and pigs, and Payne (1987) additionally for sheep/goats. The criteria outlined by Halstead et al. (2002) and Zeder and Pilaar (2010) aided in separating sheep and goat elements. Measurements follow the guidelines of von den Driesch (1976).

Quantification: The taxa were quantified using NISP (number of identified specimens) and

MNI (minimum number of individuals). Individual teeth in mandibles/maxilla were taken into account for NISP values. Thus, a mandible fragment with 3 teeth yields an NISP figure of '4' (i.e., 3 teeth, plus the mandible piece itself, equals a total of '4'). The MNI method used factored in the age categories of fetal, juvenile, subadult, and adult.

2.3.7 Land Analysis (AA)

In addition to on-site analysis of finds and structures, the project devoted equal effort to extra-site investigations in order to address the entire locale. These extra-site analyses were aimed at three major goals:

1. to gauge and map, as far as is possible, ancient agricultural potential

2. to assess the potential for movement through the landscape

3. to track to its nearest possible source any building stones found on site

Land units: The starting point for these types of analysis was the construction of a land units map. Land units are defined as portions of the territory with homogeneous characteristics of soil, substrate, geomorphology, and hydrology (Sombroek and Sims 1995). This kind of map is different from the classical soil map and more in keeping with the concept of locale, since land is a wider concept than soil:

> Land is a delineable area of the earth's terrestrial surface, encompassing all attributes of the biosphere immediately above or below this surface, including those of the near-surface climate, the soil and terrain forms, the surface hydrology, the near-surface sedimentary layers and associated groundwater reserve, the plant and animal populations, the human settlement pattern and physical results of past and present human activity (Sombroek and Sims 1995).

Thus, the land units map offers a useful way to read, communicate and interpret the physical landscape characteristics of a territory.

Moreover, it allows the application of land evaluation, aimed at establishing agricultural production potential. Land evaluation procedure was developed in the 1970s and is defined as:

> the process of assessment of land performance when used for specified purposes, involving the execution and interpretation of surveys and studies of landforms, soils, vegetation, climate and other aspects of land in order to identify and make a comparison of promising kinds of land use in terms applicable to the objectives of the evaluation (FAO 1976:1).

Recently, land evaluation has also been applied in archaeological contexts (Attema et al. 2002; Joolen 2003; Arnoldus-Huyzendveld and Pozzuto 2008).

The land units map was composed starting in 2009 from about 46 km^2 around Pievina (the first excavated site). In the following three seasons, the mapped area was expanded until the whole of the project area was covered—an area of about 360 km^2—comprising a rectangle covering the whole of the *commune* of Cinigiano. Geological data derived from the CARG 10k geological data of the Regione Toscana. The map was formed by combining data from stereoscopic aerial photographs with that from geological maps. "Land units" were identified as coherent zones of soil qualities and underlying geologies, hydrological resources, and geomorphology. Each unit was analyzed for physiography or lithology, soil depth, soil stoniness, drainage class (only for level to nearly level slopes), morphology of the landscape (slopes), dominant land use, and dominant soil type according to FAO 2006. The qualitative evaluation classes are described in Table 2.1.

The hypothetical land units assessed through this process were then checked and tested in the field: the broad-brush of large scale geological maps was checked and characterization and borders adjusted when micro-local variations were found; all water sources around the site were mapped and the location of major *fontoni* or surface water ponds were added; and a micro-local map around each site was produced showing the precise boundaries of various geological and hydrological features. The resulting maps presented an analysis of the micro-region's agricultural potential, geological and hydrological resources, and potential routeways, barriers,

Table 2.1 Classes used in the legend of the Land Units map (AA).

SOIL TEXTURE

Texture in 5 Classes	Textural Class USDA
Coarse	*sand, loamy sand*
Medium-coarse	*sandy loam* (with coarse or fine sand); *loamy sand* (with fine sand)
Medium	*sandy loam* (with very fine sand); *loam, silt loam, silt*
Medium-fine	*sandy clay loam, clay loam, silty clay loam*
Fine	*clay, sandy clay, silty clay*

SOIL DEPTH

Depth (+ modal value)	Class Description
< 25 cm (*15 cm*)	very shallow soils
25–50 cm (*40 cm*)	shallow soils
50–100 cm (*70 cm*)	moderately deep soils
>100 cm	deep soils

SOIL STONINESS

Stonieness (+ modal value)	Class Description
5–20% (*10%*)	slightly stony
20–40% (*30%*)	moderately stony
40–90% (*60%*)	stony
>90% (*90%*)	extremely stony

SLOPE

Inclination in % (+ modal value)	Single Slope	Landscape
0–1% (*0%*)	level	level
0–3% (*2%*)	nearly level	nearly level
1–8% (*4%*)	gently sloping	undulating
4–16% (*10%*)	sloping	rolling
10–30% (*20%*)	moderately steep	hilly
25–60% (*35%*)	steep	steep
>45% (*60%*)	very steep	very steep

SOIL DRAINAGE

Class Description	Characteristics
very poorly drained	water is removed from the soil so slowly that free water remains at or very near the ground surface during much of the growing season
poorly drained	water is removed so slowly that the soil is wet at shallow depths periodically during the growing season or remains wet for long periods
imperfectly drained	water is removed slowly so that the soil is wet at a shallow depth for significant periods during the growing season
moderately well drained	water is removed from the soil somewhat slowly during some periods of the year
well drained	water is removed from the soil readily but not rapidly
somewhat excessively drained	water is removed from the soil rapidly
excessively drained	water is removed very rapidly

and sight-lines, expressed as land units (cf. Arnoldus-Huyzendveld and Pozzuto 2008).

The land units map was then used to produce a land suitability map. Land suitability for crops and tree crops was established for each land unit. For low-technology agriculture, we originally considered clayey soils more suitable than fine sandy soils, since they have a higher natural fertility and water availability, although they are harder to plow. Following a set of conversations with local farmers, who reported on the major difficulties involved in plowing these clayey soils and in particular those in the area to the south of Borgo Santa Rita where many of the project sites were located, we could feasibly downgrade the potential of these soils from being "highly suitable" to "moderately suitable" and upgraded the fine sandy soils. For most sites, we produced two land evaluation "hypotheses," representing the challenges presented by this issue.

2.3.8 Movement (AA, CG)

Movement potential was also analyzed for the entire project area. Movement potential was defined as the relative difficulty or ease of movement on foot across different kinds of terrain. Terrain here was defined principally by topography and hydrology. The assessment is only a rough sketch and may overestimate movement potential over flat or rolling terrain that is today grass- or crop-land but that previously was impeded by scrub. Movement potential is not meant to describe how humans did move through the landscape, but rather is an estimate of opportunities and challenges.

In order to establish a framework for understanding the nature of short-, medium-, and long-distance movement, we employed GIS to reconstruct possible routes through this region. These routes cannot with any degree of confidence be connected to any hypothetically constructed network of major Roman roads since very little work has been done on such networks in this part of Tuscany. However, some attention has been devoted to lower-order networks of roads, routes, and paths in the countryside, and it is these lower-order networks that are of most interest in the present context (Settis and Gabba 1989; Wickham 2005:383–441; Citter 2007:9; cf. Dall'Aglio 2010).

As part of the recursive method adopted throughout the project, we employed complementary tools in dialectical ways to acknowledge the limitations of each approach on its own (cf. Grey et al. 2015). Two principle levels of GIS reconstruction—historical and quantitative—followed by field testing, formed the basis of the analysis. The first level of GIS reconstruction took as its starting point traces of roads still visible in aerial photographs from the 1940s and 1950s, as well as those still used today. We constructed prospective routes across the landscape with the simple criteria that each route be plausible and pragmatically achievable, given the modern distribution of farms, fields, along with barriers to and facilitators of movement. The second GIS reconstruction calculated least-cost paths to connect two or more places. This was done by converting a map of the topographical elevations of the region into a map of slopes expressed in percentages that could then be weighted in different ways to emphasize that certain obstacles (such as steep slopes, ravines, and rivers) might be accentuated as more-or-less impassable (Fairén Jimenéz 2004). The resulting cost surface was then queried to generate least-cost paths between any two points. This produced alternative paths whose costs flipped by adjusting the weighting in the model of certain features (e.g., slopes, small rivers, medium-sized rivers, and major rivers), sometimes by as little as a factor of 0.05 (Citter and Arnoldus-Huyzendveld 2011; cf. Bell and Lock 2000).

Given that there is no hard science on how much one should weight one obstacle over another, routes were also ground-truthed in order to evaluate the nature of mobility along the various paths proposed. Field testing was then undertaken, starting from the proposition that ancient travel took place on foot accompanied by donkeys or mules bearing panniers or saddlebags.[1] We also assumed that the inhabitants of a region do not encounter their landscapes with a mental blank-slate, but rather base their movement on foreknowledge of those landscapes (Thomas 2001:173; Gibson 2007:63; cf. Fitzjohn 2007). Therefore, rather than simply walking the routes generated on the basis of aerial photographs and least-cost path projections, we adopted a multi-stepped approach in order to simulate various phases of "familiarization," beginning with a driving reconnaissance and proceeding to detailed journeys on-foot. Driving permitted a broad familiarity with the terrain and an overall sense of

what kinds of terrain were passable (e.g., ridges) and which not (e.g., river valleys). Subsequently, walking obtained both a general sense of the time required for each route option and a better appreciation of other challenges—such as the presence of drinking water, the challenges of particular types of vegetation, etc.

The debate surrounding preferences for ridgeway versus contour-based movement, and the question of whether elevation change was navigated via a straight line switchbacks (Gibson 2007:10), has consequences for the methodological decisions we made during our landscape prospection. During our process of generating and ground-testing paths across this locale, we determined that the modern roads served as acceptable, if simplified, approximations for routes between sites. We found them to be analogous to, but also at times divergent from, the least cost paths generated by GIS. Pragmatically, the most significant implication of this decision revolved around our experience of the waterways and slopes of the locale, for the routes we walked tended to be characterized by bridges that traversed ravines and gullies with rivers and streams running along their bottom. This had two effects. First, it created "shortcuts" across the terrain, since these modern roads removed the need to cut back into spurs in search of crossing-points, and, moreover, tended towards gentler gradients than might otherwise have been expected given the physical topography. Nonetheless, in the absence of consensus in modern scholarship and any information about patterns of movement across this locale in antiquity, these roads served our limited objective of arriving at plausible approximations of ancient routes around, across, and through the region.

Second, utilizing modern roads had the effect of reducing the number of required river-crossings on any given route, and minimizing the effort-cost even for those crossings that we did undertake. The hydrological regimes of the major rivers in the locale, along with the associated topographical characteristics, largely shape the respective ease or difficulty with which a particular waterway can be traversed at a particular point.

As a part of our recursive method, too, GIS maps were generated for the purpose of illustrating or asking specific questions about movement in a landscape. Those questions revolved around the characteristics and role of "central places," the value of visibility as a measurable component of a site, and the extent to which subjective decision-making can be modeled using GIS methodologies. The maps included, among others, a cost-surface raster of the effort required to travel to the hilltop agro-processing site of Case Nuove from all points in the locale, and least-cost path maps between each of the larger sites in the locale and the site of Paganico.

2.3.9 Geological Materials (AA)

The geological maps (CARG 10k geological data of the Regione Toscana) were used to source the nearest potential source of the building stones found on each site. These stones were examined and categorized and their types added to the site map. The geological map was then field tested with samples of the stones in question at hand. As with the soil and movement maps, the building stone maps represented potential, not verifiable, sources used by these sites' occupants. Like these other maps, they provided useful ways of mapping the locale which, when laid against one another and against other evidence, generated a variety of new hypotheses.

2.3.10 Botanical Analysis (AMM)

Botanical analyses included pollen, non-pollen palynomorphs (fungi and algae), and seeds/fruits as paleoethnological and paleoecological indicators for environmental reconstructions (López-Sáez et al. 2000; Geel et al. 2003; Buonincontri et al. 2013).

Botanical sampling was judgment driven rather than comprehensive. Any stratigraphic context that was deemed significant, either because of its stratigraphic placement or because it promised important organic remains, was collected for macroremains analysis. Although selective, this nonetheless resulted in a wide range of contexts which represented both background and plant-rich areas and, for the smaller sites, this often saw all major contexts subject to macroremain collection. Pollen sampling was likewise limited to contexts of stratigraphic or functional interest which were further deemed undisturbed by root action and could be sampled in an undisturbed section. In addition, for most sites, a set of extra-site pollen samples were taken from the underlying geology in order to obtain a "pre-site" record of plant activity "near site."

All stratigraphically significant contexts were wet sieved for plant macro-remains with sieves of 10, 0.5, and 0.2 mm. Seeds and fruits from each fraction were sorted under a Wild M10 stereomicroscope. The identification was made at 80x magnifications with the reference collection, atlases, and keys. This same sieving regime also served for faunal analysis (see above).

Pollen was collected through syringe extraction from newly cleaned sections, as well as from non-archaeological contexts to obtain near-site background levels (Fig. 2.4). The treatment of 5–10 g of dry sediment per sample included the sieving through a 7-μm nylon handheld sieve and heavy liquid separation with sodium metatungstate hydrate (Florenzano et al. 2012). Lycopodium tablets were added to calculate concentrations (P or NPP/g = pollen or non-pollen palynomorphs, per gram). A mean of ca. 500 pollen per sample was counted. Counts on pollen and NPPs were carried out on the same samples and on permanent slides. Identifications were made at 1000x magnification with the help of keys, atlases, and the reference pollen collection of Modena University. Percentage pollen spectra are calculated on the total pollen counted. Crushed or damaged pollen grains that could be identified were summed in the relevant taxa. Only pollen that could not be identified was included in the deteriorated sum.

Quantification included not only catalogs of identified species but also group tallies for cereals, arboreal and non-arboreal pollen, wetland species, and Local Pasture Pollen Indicators (LPPIs). Local Pastoral Pollen Indicators (LPPIs), a group of taxa strictly correlated to local pastoral activities (Mazier 2007), are particularly helpful for estimating the response of plants to browsing and the correlated presence of animal breeding or pastoral activities in a territory. These include some Asteraceae (*Aster* type, *Centaurea nigra* type, *Carduus*, *Cirsium* type, *Matricaria* type, and Cichorieae), *Galium* type, *Heracleum* cf., *Potentilla* type, *Ranunculus* type, and Ranunculaceae indiff. Cluster analysis of mean data per site was performed with the Tilia program (CONISS—Constrained Incremental Sum of Squares; Grimm 2004).

As in other fields of palynology, there is not a linear correspondence between the amount of one type of pollen in a spectrum and its significance. Moreover, pollen arrives in layers often by human transport i.e., after a selection. Therefore, the interpretation of palynological analyses must be based on the assumptions that are at the base of site formation and palynology of archaeological sites (Dimbleby 1985; Mercuri et al. 2015). Similar percentage values of pollen of different taxa may mean different things, because some species may be high or low pollen producers, thus over or under-represented in the spectra.

Fig. 2.4 Pollen sampling from section, Case Nuove, 2010.

Selection and distance of the plant source from the site are further important variables in pollen spectra composition. Low amount of cereal pollen may be an indicator of crop fields near the site, where high amounts are more easily indicators of some type of plant accumulation as in warehouses or rubbish pits (e.g., Mercuri et al. 2006; Bosi et al. 2011). Interpretation is so tightly linked to the archaeological context that similar values may be differently interpreted (Mercuri 2008). Furthermore, even excavated pollen is the result of the many years of accumulated pollen: the pollen spectrum for a particular archaeological context may represent phenomena that had occurred in different years (such as the accumulated residues of different crops grown). As will be evident from the following analyses, teasing rotation and other forms of convertible systems from pollen data is challenging. Thus, rather than a definitive map, the pollen data provide a set of hypotheses that can be laid against other data such as structures, faunal data, and land units analysis.

2.3.11 Small Finds Analysis (SCE)

Small finds included metal objects, worked bone, lithic, or other miscellaneous artifacts beyond typical ceramic vessel classes and faunal taxa. While distinct from small finds, coinage and vessel and window glass were also included along with the other small finds. These objects were identified and catalogued along traditional lines. That said, the coinage and small finds recovered from multiple sites afforded an opportunity to implement more advanced computational or quantitative methods in interpretation of archaeological data in the Roman countryside. For example, while quantities of objects (according to any metric) typically inform one's conception of the prevalence of an artifact class, these quantities are subject to the influence not only of the intensity of collection, but also the potential duration of their use over time. Coinage, whose mint date gives it a more precise *terminus post quem* than many other artifacts, served as a useful case study for developing mathematically valid estimates of quantities of artifacts over time (Collins-Elliott 2019). Developing automated systems of inference, which would take finds assemblages and derive indices of different behaviors or activities at each site-phase, can be achieved through computational means. Providing formal statements of ontological relationships between artifact and function allows for more rigorous, large-scale analysis of shifts in practices such as craft industry and exchange over time (Collins-Elliott 2018). Glass vessels were quantified using multiple metrics (shard count, weight, and EVE). The choice of metric behind vessel quantification has been of significant interest (Orton 1975, 1993, 2009), and, in this light, composite scores using multiple metrics afford a means to obtain a single and concise measure of magnitude (cf. Akerraz and Collins-Elliott 2017:12–14).

Estimates which seek to quantify an unknown parameter (the amount of material in use in the past) from a known sample (the archaeological assemblage), depend on the assumption that the assemblage in question is a random assortment of material recovered from each site. This criterion nevertheless would seem appropriate for most archaeological finds, especially those recovered as residual materials from chronologically posterior depositional contexts. For random assemblages of material, quantitative methods and models are inherently important for establishing a basic sense of scale. It is necessary to adopt methods which suit the needs of archaeological investigation. The potential of Bayesian inference—that a prior probability (an initial state of knowledge) multiplied by a likelihood (the observation of data) will yield a posterior probability—has been recognized, and realized, for archaeology (Buck, Cavanagh, and Litton 1996; Shennan 1997:48–49; Orton 2004; Buck and Meson 2015). This "subjective" view of probability serves the interests of archaeology well and provides for a fruitful avenue of engaging in complex analysis.

Model-building using Bayesian techniques is gaining ground when it comes to providing meaningful answers to historical questions (Lavan 2016, Rubio-Campillo et al. 2017). While these methods will increase in use as computational literacy grows in the field (Brughmans et al. 2019), methods should be tailored to the problem at hand. In archaeology, a question which is most often raised is one of the similarity or dissimilarity between assemblages and sites, and which factors lie behind those distinctions. This question can be solved through various means, involving cluster analysis, multidimensional scaling, principal component analysis, or correspondence analysis (Baxter 1994). Exploring the project's small

finds assemblages through non-metric multidimensional scaling revealed that assemblages organized by site-phases found no marked groups, but rather a gradation of associations, in which differences in exchange and craft production appear to have exerted the most influence (Collins-Elliott 2018). Moreover, there was a significant difference between the late Republican and late antique periods in terms of the overall similarity of small finds characteristics. In this volume, multiple correspondence analysis (MCA), which was famously used by Pierre Bourdieu in *La distinction, critique sociale du jugement* (1979; cf. Bourdieu and de Saint Martin 1976) was applied not just to the small finds assemblage, but to a full range of descriptive factors of each-site phase.

2.4 Quantification (KB)

As the above material-specific methodologies will make clear, the project employed the quantitative methods current to those sub-fields. For instance, the team debated the utility of MNI (Minimum number of individuals) versus EVE (Estimated Vessel Equivalents) quantification for ceramics and glass, and both were ultimately employed here depending on artifact types, research questions, and taphonomic circumstances. The Multiple Correspondence Analysis on small finds and other project data represents a new way to compare the material culture of our sites.

In some cases, the project data itself led us to a new skepticism of other quantitative practices: these included calculations of caloric efforts via least cost path analysis, the calculation of yields or carrying capacity based on land area and survey data; and demographic estimates. In these instances, we deliberately have not published these analyses, although in some cases we ran them and they formed part of the discussion among team members. The current vogue for quantification, particularly among the economic historians with whom we closely engage in this book, has often outraced a proper disclosure of assumptions lurking between the data points, a clarity about the heuristic aims of such quantification and an appreciation for the highly contingent nature of most ancient datasets (Morley 2014). In many instances, the results of quantitative exercises run purely for heuristic purposes are now cited as "fact." Archaeological data sets are particularly vulnerable to extraction and recitation without consideration for their highly contingent nature, or interest in the totality of material data as opposed to one find type. Indeed, many of our results, particularly those on land use and landscape, point up the erroneous assumptions lurking behind some contemporary uses of this data and we have signaled these as they arise.

NOTES:

2.1 Carts were rare in Tuscany even into the third quarter of the 20th c. Contemporary ethnographic evidence attests a type of sledge or slide-cart known most commonly as the *treggia*, but this vehicle appears to have been introduced into Tuscany by immigrants from northeastern Europe in the early modern period (Caselli and Guerrini 1977).

3

Land and Locale

Antonia Arnoldus, Kim Bowes, Cam Grey, Mariaelena Ghisleni, and Eleonora Rattighieri

The Roman Peasant Project was carried out in the township (*comune*) of Cinigiano, Grosseto province, in southern Tuscany (Figs. 3.1 and 3.2). The *comune* lies in the rolling hills where the coastal plain begins to give way to the increasingly hilly interior and the slopes of Monte Amiata (1,738 m asl). The area is neither coastal plain nor interior, and lay between and distant from the three major Roman arteries—the coastal Via Aurelia and the interior Via Clodia and Via Cassia—that ran through this part of Roman Italy.

Southern Tuscany has been subject to some of the most intensive archaeological investigation in Italy. To the south of the project area, large-scale excavations of the Roman city of Cosa and the Roman villa of Settefinestre led to a series of large-scale field surveys such as the Albenga, Oro, Chiarone, and Tafone valley surveys and the Ager Cosanus Survey (Brown 1980; Fentress 2004; Dyson 1978; Carandini et al 2002, respectively). Other, smaller scale but important projects have investigated the coastal littoral closer to the project area: excavations in the Etruscan and Roman city of Roselle, survey of the coastal plain around Grosseto, the discovery of the great amphorae kilns at Albinia, and excavations at the Ombrone River port at Alberese (Nicosia and Poggesi 1998; Citter and Arnoldus-Huyzendveld 2007; Ciampoltrini 1997; Fentress and Perkins 2016; Sebastiani et al. 2015, respectively). Inland, the teams from the University of Siena have carried out a series of surveys as part of the *Carta Archeologica di Siena*, including the *communi* of Montalcino and Monte Amiata, adjacent to the study area (Cambi 1996; Campana 2013).

Not only has the area as a whole seen considerable study of both its Roman landscapes and its individual sites, but those findings, particularly the excavations at Cosa and Settefinestre and their attendant surveys, have been employed in a set of widely accepted narratives about Roman settlement and economies in Italy writ large. Cosa became a site-type for a Roman Latin colony and the Roman colonial project and the study of its hinterlands have helped to define the impact of Roman rule and colonial settlements on local Etruscan populations. The excavation of the villa at Settefinestre is likewise a site-type for the so-called slave villa, the purported discovery of its slave quarters and large-scale wine producing facilities physical proof of a textually derived model of slave modes of agricultural production. This model of the slave villa in turn plays a major role in the narrative of settlement in central Italy, where such villas and their monocultures eventually pushed out smallholders by buying up their land—a narrative that field survey trends from the Albegna and Cosa surveys have been used to support. The eventual collapse of these villas and the supposed eventual migration of such activities to the provinces in the imperial period is likewise based on these sites and surveys. The

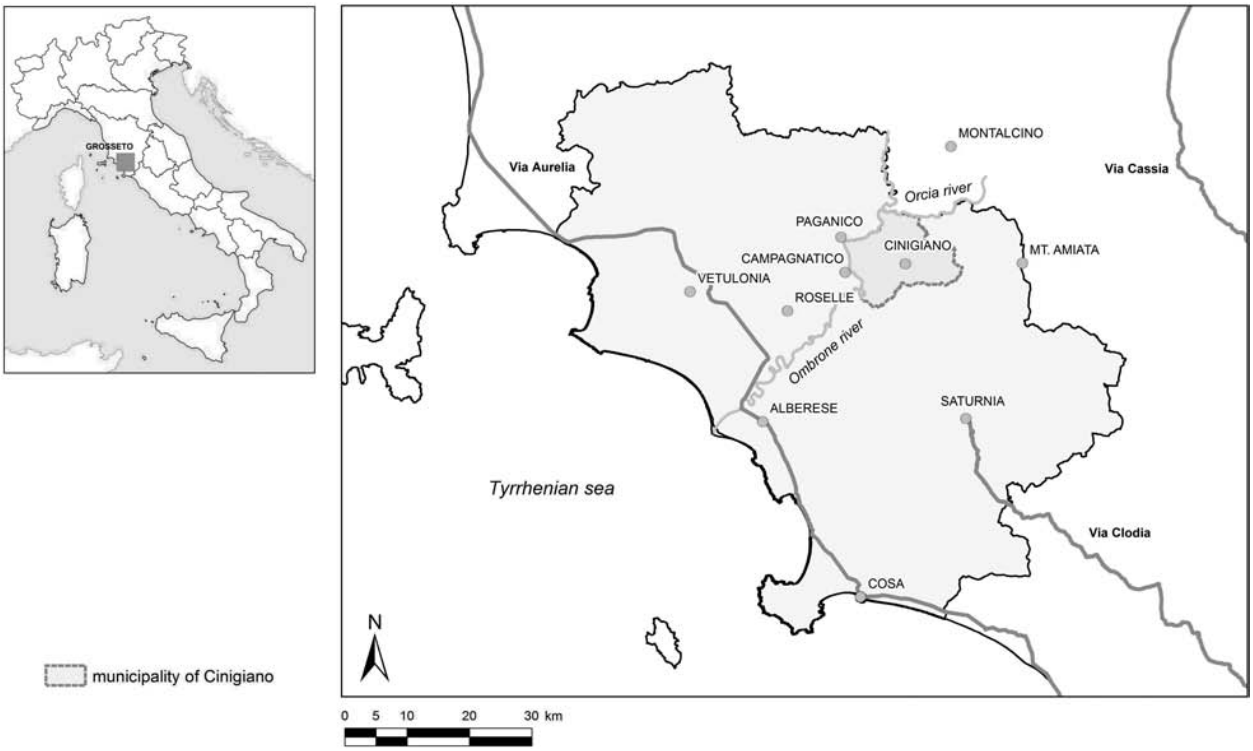


Fig. 3.1 Map showing location of project area (AA).

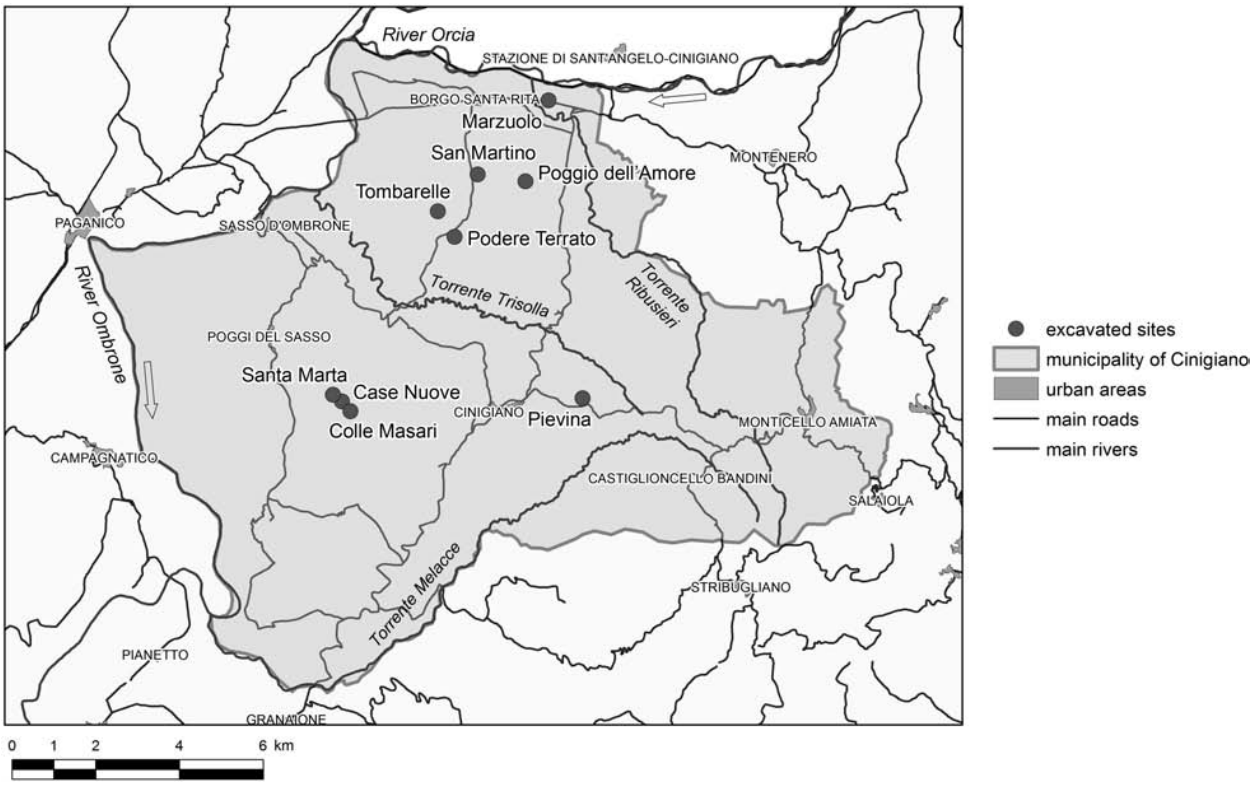


Fig. 3.2 Map of project area, showing excavated sites and other topographic features (AA).

archaeological investigations of southern Tuscany have in many ways helped to drive models of Roman history more broadly.

The Roman Peasant Project research area was in part selected for its adjacency to these previously studied regions. As a project whose goals were in part to subject these narratives to critical examination, and to adopt a bottom-up approach to subjects which had traditionally been examined from the perspective of the city or villas, it seemed important to base our study in roughly the same general geography.

At the same time, the *comune* of Cinigiano is also liminal relative to these previously studied areas. Inland from the coastal littoral, distant from both the coastal Via Aurelia and the inland Via Cassia, a long day's walk to the nearest Roman city at Roselle and two or more days to inland Chiusi, the project area lacked many of the definitions of "centrality" that characterized the better-studied areas of the coast and south. For these reasons it had never seen any systematic archaeological study until the surveys carried out as part of the doctoral thesis of Mariaelena Ghisleni in 2006–2009 (Ghisleni 2010). It was specifically because of its adjacency to paradigmatic places and its separation from them that the Roman Peasant Project was sited where it was.

What follows is a *mis-en-scene* for the project, intended to provide both some methodological foundations for the project's understanding of place and some particular details about that place. It begins with a definition of "locale"—a concept which helped frame the project's approach to place and human activity, and, by extension, provides the opportunity to use this particular part of Tuscany for an investigation of peasant lifeways. A more detailed discussion of the land and its human interlocutors follows, concluding with further thoughts on this particular locale as a production of joint environmental/human activities.

3.1 Locale (KB, CG)

In setting out the project and locating it in southern Tuscany, we drew heavily on social geographers' definition of "locale." In its broadest sense, a locale is a physical setting for social interactions. More precisely, locale provides the arena within which interaction with other people takes place, providing the structure both for everyday routine—be it economic, religious, or social—and for general modes of socialization (Agnew 1987; Werlen 1993). The concept of the locale views environment not as a distinct and separable from human activity, but one with it, the one constantly reconstituting and restructuring the other. Drawing upon the more phenomenological framing of Knapp and Ashmore, among others, landscape for us was "an entity by virtue of its being perceived, experienced, and contextualized by people" (Ashmore and Knapp 1999:1). When interrogating a landscape in which the very questions of human "dwelling" and their relationship with the land were at issue, it seemed unhelpful—and potentially anachronistic—to begin by imagining a pre-human "space" which only became "space" when humans—particularly our peasants—acted upon it (cf. Thomas 2008). Further, what Thomas and Ingold frame as a "dwelling perspective" has also helped us imagine places and people as constitutive in not only space but also time. "Dwelling" may be imagined as a condition of mutual implication between humans and landscapes, involving perpetual motion through space, and located in a present that situates itself with specific reference to both its past and its future (Ingold 1993, 2011). This notion of a human-space matrix allows us to avoid the twin pitfalls of environmental determinism on the one hand and an over emphasis on human actors on the other, and to analyze all activity on an, ideally, equal plane. Locale is life, in process, in place.

The idea of locale also imagines activity as coterminous with landscape, and action as central to the constitution of places. As a consequence, Ingold's notion of a "taskscape" as an articulation of space through the particular activities that shape it was, as will become clear, a particularly useful way of seeing our data. Interested as we were in people doing things on the ground in different places, the spatially constituted nature of these tasks or activities was central to our project. Indeed, as Chapter 5 makes clear, the project data forced us to interrogate the very nature of peasant "living" and "habitation." The idea of the taskscape was particularly well suited to address questions of this sort, for, in defining as a task such disparate actions as agricultural labor, construction of buildings, tending of flocks, fields and structures in those fields, even the act of walking itself, this analytical concept continually reminded us of the intimate, dialectical relationship between the landscape and

its denizens. Thus, even in this chapter dedicated to the land and locale, the environmental features of the place—geology, hydrology, topography—are not imagined as a substrate on which the later human material of archaeology is enacted. While environmental and human characteristics are presented separately, they are ultimately integrated to make some observations on the locale—a conjoined activity space where environment and human action collide.

The selection of the particular area of Cinigiano for the Roman Peasant Project responds directly to this definition of locale itself. One of the principal reasons for that decision was the relatively "light" nature of human action over the *longue durée*, resulting in a relatively good level of archaeological preservation. Mechanized agriculture was slow to come to many areas of Italy, Cinigiano being one. Large-scale viticulture is particularly destructive to archaeological remains but has, unlike adjacent areas on the coast and inland, been likewise little practiced in Cinigiano. Rather, traditional cereal and fodder crops have long remained standard agricultural produce, along with small-scale vineyards and olive groves for family consumption. This relatively light modern activity profile in the locale has, as a consequence, produced relatively well preserved subsurface remains of past activity.

The geological matrix of activity has likewise been light. As will be described more fully below, the area has seen little erosion, either natural or ma made, little geomorphological change except along river courses, and virtually no uplift or subsidence in historical times. As a consequence, the physical landscape is much as it was during the Roman period, a fact which means archaeological levels are relatively easy to find, making hypothesis testing using modern physical data less problematic.

In part, the lightness of both human activity and geological change have been occasioned by the same factor—the relative liminality of the area vis-a-vis the more intensively used locales of the coast and the interior. The fact that Cinigiano lay away from these areas meant it has been and continues to be by-passed by large enterprise, from Roman villa-owning elites to modern wine growers. The low presence of Roman elites in the locale (discussed further below) was particularly appealing to us as it meant the presence of non-elites might be more readily apparent.

The final reason this area was selected was a product of its contemporary human activity matrix—namely the excellent data compiled on the locale by Ghisleni for her doctoral thesis. Ghisleni's survey used a variety of both remote sensing and small-scale excavations, producing a large quantity of high-quality data on human activity from all periods. Most important of these was her use of a hand-held GPS to map not only individual sites, but individual scatters within those sites. Unlike with field surveys done before GPS technology, this made it possible to relocate these sites and excavate them, and to target excavations within different areas of the scatter.

3.2 Land (AA)

From a geological viewpoint, southern Tuscany can be considered a tectonic mosaic. This quality derives from the presence of two geological units: older, high, steep, intensively folded and partly metamorphosed geological units (uplifted blocks or "horsts"), alternating with younger ones, generally lower, with a gentler morphology and with layers only slightly to not tilted (subsided blocks or "graben").[1] This fragmentation was due to the "stretching" of the Earth's crust, related to the orogenesis of the Apennine mountain chain. It started during the Upper Miocene[2] and continued unto the Quaternary. Volcanism and metal ore enrichment were due to the same process.

Successively the subsided blocks became lake or sea basins and the raised blocks became ridges separating the basins. Sedimentation continued only in the subsided areas. Following several other tectonic events, in the Upper Pliocene and Lower Pleistocene a general uplift occurred, forcing the coastline more or less towards its present position. Volcanism occurred mainly during the Lower and Middle Pleistocene along with metal ore concentration along the faults.

These tectonic events still determine the present lithological and morphological variability of the region: the subsided blocks make up today's hilly landscape of the Upper Miocene and Pliocene formations, whereas the raised blocks compose the rather steep slopes with stony soils of the Secondary and Lower Tertiary (or Paleogene) periods. The alternation between former subsided and uplifted blocks characterizes the greater part of the Tuscan landscape, which can be said to have a "modular" or mosaic quality.

This typical Tuscan morphology also characterizes the project area (Fig. 3.3), which can be imagined

as three distinct geological modules. The central part is made up of rolling hills (Fig. 3.4) with deep soils in younger geological formations, whereas the western and eastern parts have steep reliefs (Figs. 3.5 and 3.6, respectively) with stony soils in older formations belonging to the "Flysch" facies (Early and Middle Tertiary period) and the "Serie Toscana" (Tuscan Nappe or Domain), ranging from the Secondary to the Middle Tertiary period.[3] In the central area the younger formations predominate, dated from the Upper Miocene to the Holocene. The Upper Miocene–Pliocene formations consist of well-stratified sands, sandstones, generally not very compact, and conglomerates, covering marine-lacustrine marls and clays.[4]

Rare are Lower Pleistocene travertine outcrops, but, in several sites, they were used as building stones (see Chs. 6 and 7). More common, however, in the northern and south-western areas are Pleistocene fluvial terraces of the Ombrone and Orcia Rivers, elevated with respect to the valley floors. They are generally composed of loamy fine sandy surface layers, lying upon gravelly layers which crop out along the eroded terrace margins. Three terrace levels could be distinguished, while the extension of these is the intermediate level located south of the Orcia, called the "Piani Rossi" (Fig. 3.7) where several sites excavated by the project are located. The Holocene valley floors of the Orcia and Ombrone are the most extended among the river valleys (Fig. 3.8).

The general river configuration of the Cinigiano region is determined by the interaction between a radial drainage network originating from Monte Amiata with the major Ombrone and Orcia Rivers, which cross the northern and western extremes of the area and collect the entire outflow from the western slopes of the volcanic dome (Fig. 3.9) (Benvenuti et al. 1971). The Orcia, the left-side tributary of the Ombrone, has a braided hydraulic regime, whereas the Ombrone is strongly meandering with a frequently shifting river course (Fig. 3.10), at least where not constricted in the steep canyons (Fig. 3.11) located upstream and downstream from the town of Paganico.

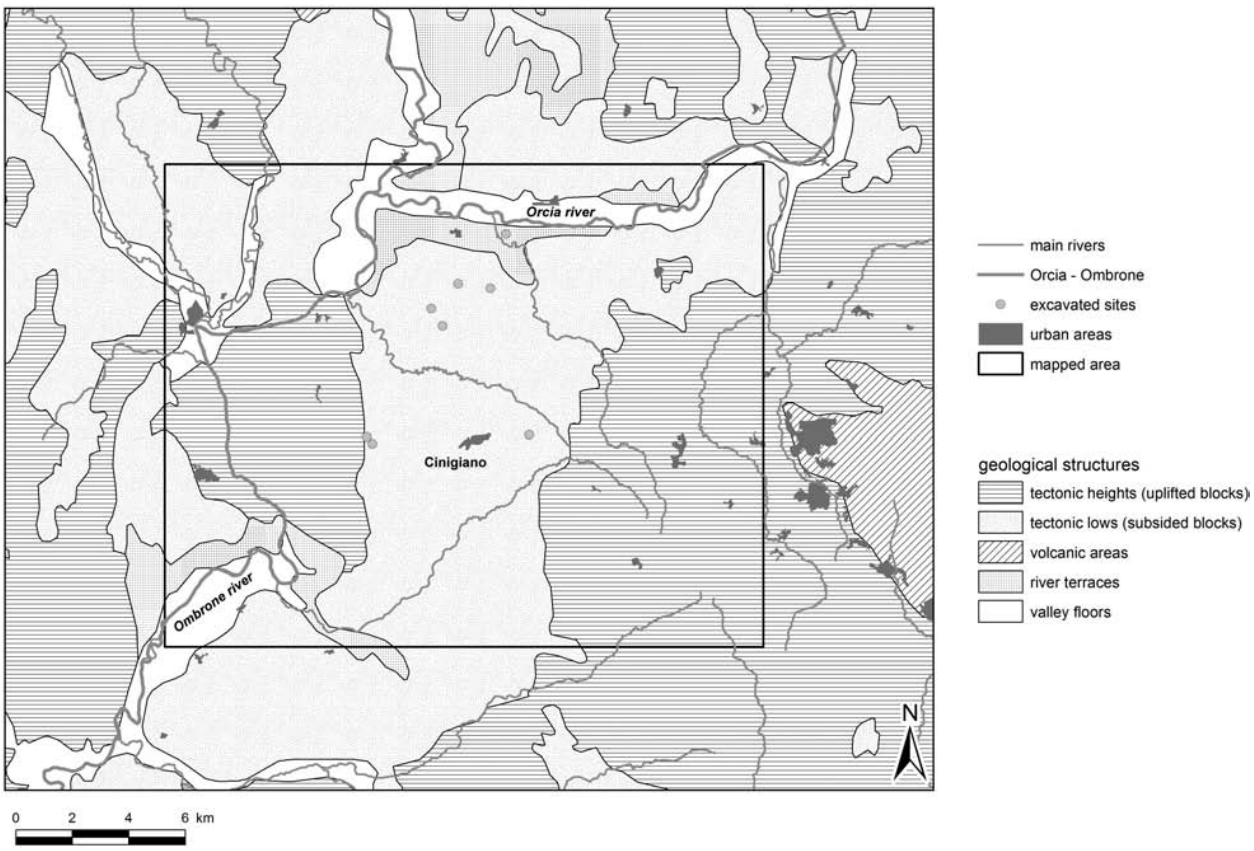


Fig. 3.3 Map, overall geological features of study area (AA).

Fig. 3.4 View of rolling Mio-Pliocene hills of central part of project area, looking N (AA).

Fig. 3.5 View of western part of project area, looking W (AA).

Fig. 3.6 View of eastern part of project area, looking E (AA).

Fig. 3.7 View of "Piani Rossi" river terrace, looking N (AA).

Fig. 3.8 View of Ombrone valley floor, looking W (AA).

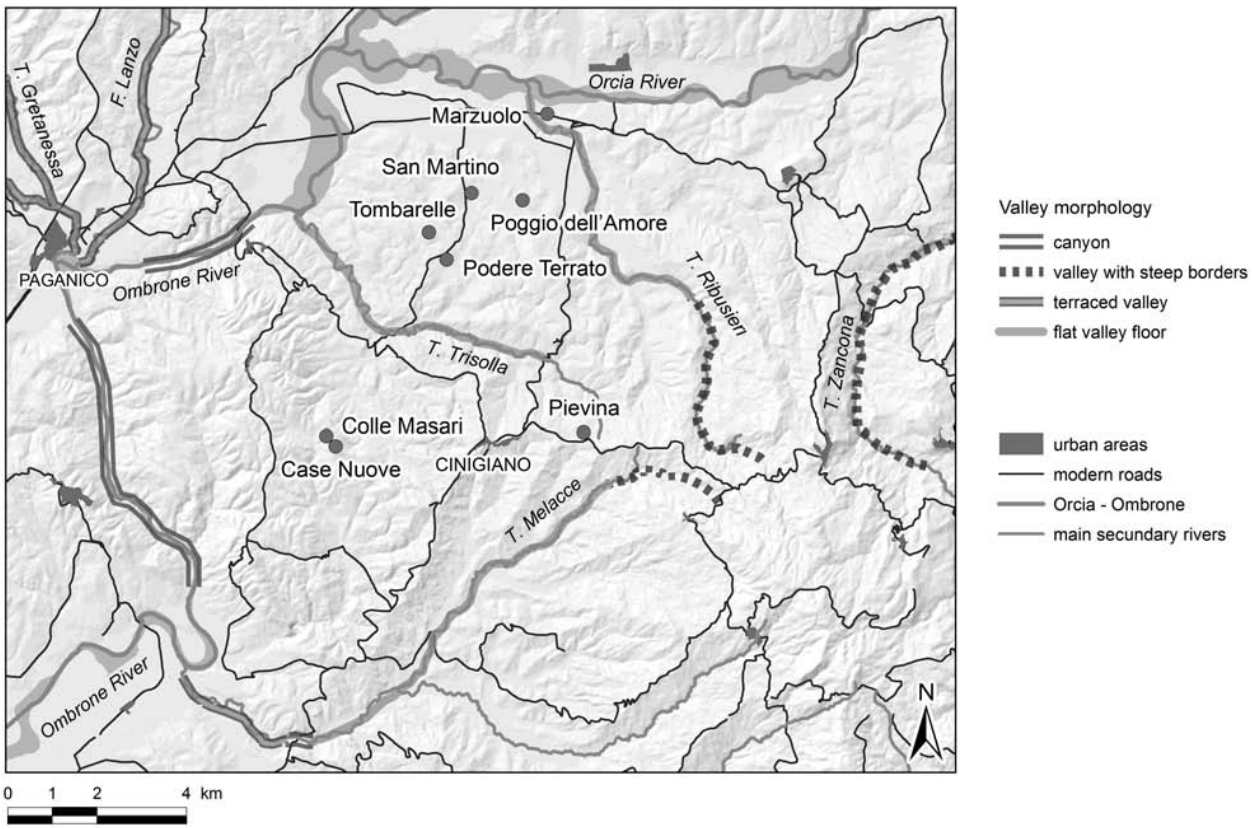


Fig. 3.9 Map, project area drainage network (AA).

Fig. 3.10 View of Ombrone River south of Campagnatico (AA).

The other main rivers of the region—the Torrenti Ribusieri, Trisolla, Melacce, and Zancona—exhibit a torrential regime. The Melacce and Ribusieri are steeply incised in the initial stretches (Fig. 3.12), but downstream change to a flat valley floor with a single river terrace, like the Trisolla (Fig. 3.13). The Zancona, a tributary of the Ente/Orcia, is steeply incised in the central stretch. The major tributaries of the Ombrone in the north-western part of the mapped area (Gretano, Gretanessa, Lanzo) exhibit a non-active valley floor, a strongly meandering river incision and several terrace levels. Smaller streams tend to be seasonally intermittent.

Aside from the rivers, groundwater outflows comprise another important factor in the hydrologic regime. In the Upper Miocene–Pliocene layers of the central part of the Cinigiano region, natural water outflows are common and appear either as artificially regulated "*fontoni*" (ponds) (Fig. 3.14), or modest springs (Fig. 3.15). The layers of these formations are typically slightly tilted (Fig. 3.16). During fieldwork it was observed that they were mainly composed of alternating layers of clays, clay-loams, fine sands and conglomerates, with a variable dominance of the one over the others. This was particularly evident near the site of Case Nuove, Colle Massari, and Tombarelle (see Chs. 5, 8, and 11, respectively). According to Motta (1969:69), such permeable sandy and conglomeratic horizons may give rise to small springs.

Although little studied as a phenomenon, the "*fontone*" seems to be typical of the Siena region, if not of Tuscany more generally. The diameter of these ponds is typically 25 to 40 m. Evidently, they are the work of man, as demonstrated by the regular and round outline, and moreover not necessarily modern, as shown by the proximity of large oak trees and abandoned structures. These ponds also maintain their water level during the summer. In the Cinigiano region, they are again limited to the areas with Upper Miocene–Pliocene geological formations, specifically the more clayey ones, and seem to have been laid out in places where the water naturally concentrates at the surface due to high groundwater caused by a special layer configuration or the nearness of a stream head. It seems likely that they are (partly) related to differentiated water movements within these geological layers.

This hydrological regime combined with the Tuscan modular tectonics lends the area its

Fig. 3.11 View of Ombrone River south of Paganico (AA).

Fig. 3.12 View of Torrente Ribusieri (AA).

Fig. 3.13 View of Torrente Trisolla (AA).

particular topographic qualities, which in turn favor certain patterns of movement and connectivity (cf. Grey et al. 2015). Topographically, the region may be divided into five broad zones (Fig. 3.17). At the northern edge of the region is a riverine plain which runs along the banks of the Ombrone and its tributary the Orcia (Zone 1). The plain is bordered by extensive fertile river terraces. Immediately to the south of the plain, a series of valleys and ridges belonging to the Upper Miocene–Pliocene landscape, formed by minor rivers and streams runs predominantly S to N towards the Orcia (Zone 2). These valleys and ridges are heavily cultivated today, under a combination of cereal crops, legumes, and grapes. In particular, a series of *poggi* (small hills) dominate this section of the landscape. Even today, these ridges, valleys and streams constitute a significant barrier to E-W movement across this part of the region. They are also the principal N-S routes. Ease of movement E-W is therefore predicated upon the capacity to cross these barriers, and there are a relatively small number of points at which roads, routes, and tracks do so. These ridges and valleys connect, in turn, to an elevated ridge, which forms a watershed between the Orcia and Ombrone Rivers and runs through the center of the region E to W (Zone 3). This ridge runs approximately 40 km at an average altitude of 300 m asl., linking Monte Amiata, the highest point in this part of Tuscany (1,738 m asl) to the river plain formed by the Ombrone and Orcia. To the south of this ridge a series of ridges and spurs, again generally running N-S, descend to the southern boundary of the region, which is represented by the Melacce (Zone 4). Finally, along the Melacce and especially around where it joins the Ombrone, there is another riverine plain (Zone 5).

Fig. 3.14 View of *fontone*, near Cinigiano (AA).

Fig. 3.15 View of ground water spring west of Cinigiano (AA).

Fig. 3.16 View of tilted strata of clay, sand, loam, and conglomerates, west of Cinigiano (AA).

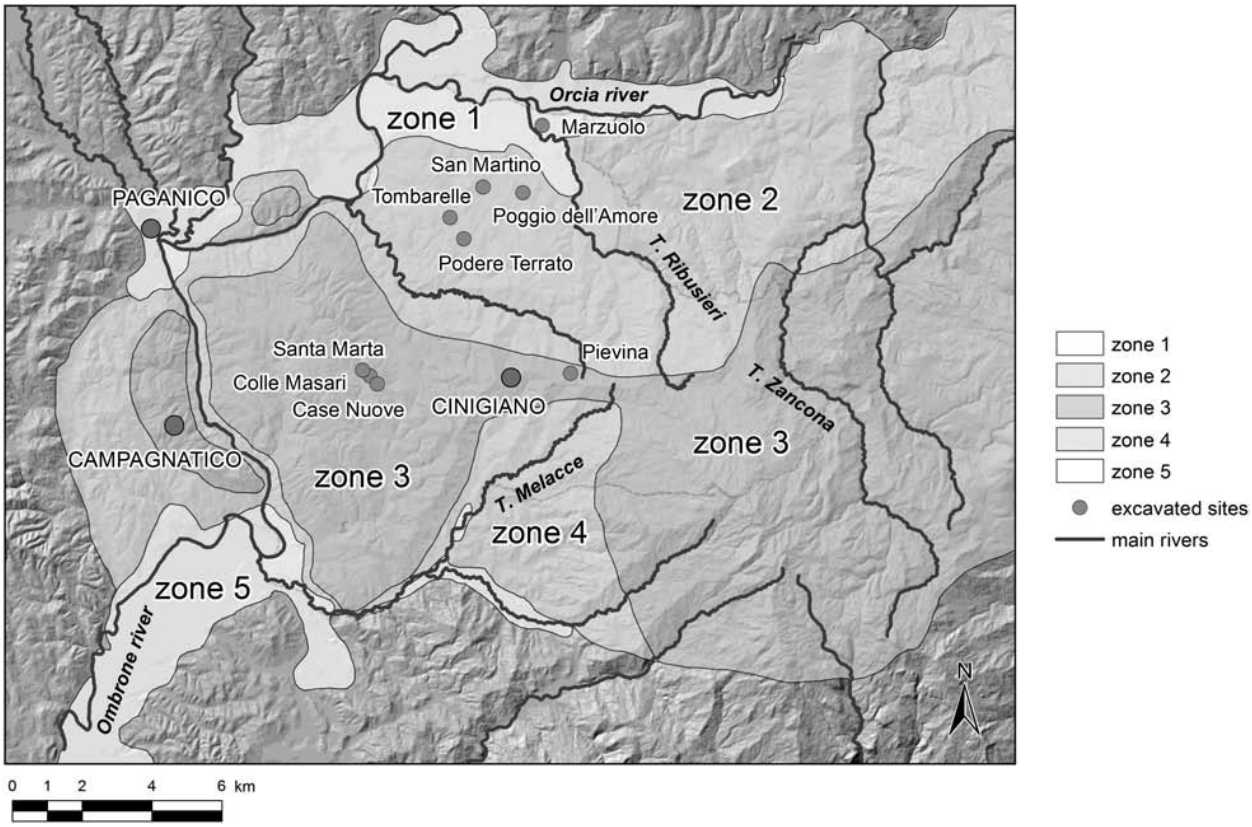


Fig. 3.17 Map of topographic zones in project area (AA).

These elements of geomorphology, soil, and hydrology were analyzed to produce a land unit map. As described in the previous chapter, land units are defined as portions of the territory with homogeneous characteristics of soil, substrate, geomorphology and hydrology. The nature of this map compared to the classical geological map can be illustrated with the example of the "macigno" sandstone, which forms a high N-S oriented ridge in the western area of the Cinigiano region, with a broad undulating hilltop and steep side slopes (Fig. 3.18). The whole ridge is mapped as a single unit on the geological maps, whereas, from the viewpoint of potential land use (in all senses: agriculture, forestry, human settlement, and mobility), there are two evidently distinct land forms, which have been delineated on the Land units map as unit **Lv** (steep slopes) and unit **Lo** (undulating broad tops). As noted in Chapter 2, the land units map is different from the classical soil map, since land is a wider concept than soil.

The map is reproduced in Color Fig. 3.19, with an abridged legend. The full legend is given in Table 3.1, together with the land evaluation classes. This final legend has 8 land systems, and 28 land units. Defined for each unit are: the physiography or lithology, soil depth, soil stoniness, drainage class (only for level to nearly level slopes), morphology of the landscape (slopes), dominant land use, and dominant soil type according to FAO 2006.[5]

Excerpts of the map in color are also given for each excavated site or group of sites.

3.3 Vegetation (ER)

The zoned patchwork that characterizes the geomorphology and land units is in part echoed in the area's current plant landscapes. However, this mosaic of different kinds of woodlands, pasture, arable land, and riverine vegetation is itself the product of centuries of human action. While some of these vegetational units seem more long-term, direct responses to geomorphological exigencies—like the riverine vegetation and some of hilltop woods—others are

Table 3.1 Complete legend of the Land Units Map of the commune of Cinigiano, scale 1:25.000, soil classification according to the World Reference Base for Soil Resources, FAO 2006 (AA).

ID	System	Land Unit	Description	class hyp. I	class hyp. II
	M) schist-carbonatic reliefs ("galestri e palombini") (pre-Miocene)				
1		Mc	moderately steep reliefs, locally rocky, with shallow, stony, non calcareous soils, slightly acid, fine textured; dominant use woods; dominant soils *Epileptic Regosols (Eutric, Episkeletic)*	N	N
2		Mo	undulating concave reliefs, with moderately deep, moderately stony, non calcareous soils, slightly acid, fine textured; dominant use woods, olives; dominant soils *Haplic Cambisols (Eutric)*	S3	S3
3		Mx	undulating convex reliefs, with moderately deep, slightly stony, calcareous soils, medium textured; dominant use vineyards, olives, cereals; dominant soils *Haplic Cambisols (Calcaric)*	S3	S3
4		Mv	very deeply incised valleys, rocky, with very shallow, stony, non calcareous soils; dominant use woods; dominant soils *Haplic Leptosols (Eutric, Skeletic)*	N	N
	C) marly shales ("argilloscisti," "alberese") (pre-Miocene)				
5		Cc	moderately steep reliefs, locally rocky, with moderately deep, non to slightly stony, calcareous soils, fine textured (clay); dominant use woods, shrubs, subordinately olives; dominant soils *Haplic Regosols (Calcaric, Clayic)*	S3	S3
6		Co	rolling reliefs, with moderately deep, calcareous soils, fine textured; dominant use olives, vineyards, shrubs; dominant soils *Haplic Cambisols (Calcaric, Clayic)*	S2	S2
	N) clay-schist and sandstones (pre-Miocene)				
7		Nr	very steep reliefs, locally rocky, with very shallow, moderately stony, slightly calcareous soils; dominant use woods; dominant soils *Haplic Leptosols (Eutric)*	N	N
8		Nx	rolling reliefs, with moderately deep, moderately stony, slightly calcareous soils; dominant use olives, shrubs; dominant soils *Haplic Cambisols (Eutric)*	S3	S3
	L) sandstone reliefs ("macigno") (Lower Miocene)				
9		Lo	undulating broad hilltops, with moderately deep, non calcareous soils, slightly acid, locally slightly stony, medium-coarse textured (loamy fine sand); dominant use cereals, vine yard, olives; dominant soils *Haplic Cambisols (Dystric)*	S2	S2
10		Lv	steep to very steep slopes, with shallow, non calcareous soils, slightly acid, moderately stony, medium-coarse textured (loamy fine sand); dominant use wood; dominant soils *Leptic Regosols (Dystric)*	N	N
	K) marly conglomeratic reliefs (Upper Miocene)				
11		Kc	hilly landscape, partly rolling, in clay, with moderately deep, calcareous non-stony soils, fine textured (clay and silty clay), with vertic properties (cracks), subordinately fine loamy sands and loams; dominant use cereals, olives, vine yards; dominant soils *Vertic Cambisols (Calcaric, Siltic)*	S1	S2
12		Ks	hilly landscape, partly rolling, in fine sands, locally with pebbles in the higher parts of the reliefs, with moderately deep, calcareous soils, medium textured (silt loam); dominant use cereals, olives, vine yards; dominant soils *Haplic Cambisols (Calcaric, Siltic)*	S2	S1

Table 3.1 cont'd Complete legend of the Land Units Map of the commune of Cinigiano, scale 1:25.000, soil classification according to the World Reference Base for Soil Resources, FAO 2006 (AA).

ID	System	Land Unit	Description	class hyp. I	class hyp. II
13		Kg	hilly landscape, in fine sand with pebbles, with moderately deep, calcareous soils, moderately stony, medium textured (silt loam); dominant use olives, vine yards, cereals; dominant soils *Haplic Cambisols (Calcaric, Siltic)*	S3	S3
14		Kv	deeply incised valleys, with shallow, slightly to moderately stony, calcareous soils, medium textured (silt loam); dominant use woods; dominant soils *Leptic Regosols (Calcaric, Siltic)*	N	N
	P) clayey-sandy-conglomeratic reliefs (Upper Miocene-Pliocene)				
15		Pa	rolling landscape, partly hilly, in clays, locally in fine or very fine sands (*), with deep, non-stony, calcareous soils, fine textured (silty clay); dominant use cereals, olives, vine yards; dominant soils *Haplic Cambisols (Calcaric, Siltic)*	S1	S2
16		Pc	rolling landscape, partly hilly, in clays, with deep, non-stony, calcareous soils, fine textured (silty clay); strongly eroded by gullies; dominant use olives, shrubs; dominant soils *Haplic Regosols (Calcaric, Siltic)*	S3	S3
17		Pv	depressions with an undulating to rolling morphology, with calcareous soils, fine textured (silty clay and clay) with vertic properties (cracks); dominant use cereals; dominant soils *Vertic Cambisols (Calcaric, Clayic)*	S1	S2
18		Pr	fluvial system dissecting the unit Pa, down to the level of the intermediate terrace (T2) of the Orcia-Ombrone river system; undulating to nearly level landscape, with calcareous soils, fine textured (silty clay and clay) with vertic properties (cracks); dominant use cereals; dominant soils *Vertic Cambisols (Calcaric, Clayic)*	S1	S2
19		Pt	local outcrops of travertine overlying the Pa landscape, with very shallow, stony, fine textured, calcareous soils; dominant use shrubs; dominant soils *Lithic Hyperskeletic Leptosols (Calcaric)*	N	N
20		Pg	hilly landscape, partly rolling, in conglomerates, often with moderately steep borders, with moderately deep soils, locally reddish in the higher parts of the reliefs, calcareous, moderately stony (pebbles); dominant use woods, shrubs, olives; dominant soils *Haplic Cambisols (Calcaric, Siltic)*	S3	S3
	T) fluvial terraces (Pleistocene)				
21		T1	(in 2009 "T") fluvial terraces and slightly elevated valley floors, nearly level, with moderately deep, moderately stony, calcareous to non-calcareous soils, medium-coarse to fine textured (loamy fine sand to clay loam), moderately well drained; dominant use cereals; dominant soils *Cutanic Luvisols (Calcaric - Hypereutric)*; mostly other rivers, but locally also the Orcia-Ombrone river system	S2	S2
		T2	surface of the intermediate terraces of the Orcia-Ombrone river system, level to nearly level, moderately well drained		
22			subunit T2a: the "Piani Rossi", with reddish brown, moderately deep, non calcareous soils, slightly acid, medium-fine textured (clay loam), non to slightly stony, but stony in depth, well drained; dominant use cereals, subordinately vine yards; dominant soils *Cutanic Luvisols (Hypereutric, Clayic)*	S1	S1
23			subunit T2b: terrace surface with grey, moderately deep to deep, non-calcareous soils, locally calcareous, medium-coarse to fine textured (loamy fine sand to clay loam), non to slightly stony, but stony in depth, well drained; dominant use cereals, subordinately vine yards; dominant soils *Cutanic Luvisols (Hypereutric)*	S1	S1

Table 3.1 cont'd Complete legend of the Land Units Map of the commune of Cinigiano, scale 1:25.000, soil classification according to the World Reference Base for Soil Resources, FAO 2006 (AA).

ID	System	Land Unit	Description	class hyp. I	class hyp. II
24		Tv	moderately steep borders or incisions of the intermediate terrace of the Orcia-Ombrone river system, with shallow slightly calcareous soils, medium-fine textured (clay loam), stony (pebbles, 3–5 cm); dominant use shrubs; dominant soils *Haplic Regosols (Skeletic, Eutric)*	S3	S3
25		T3	remains of the high terrace of the Orcia-Ombrone river system, nearly level, with moderately deep to deep, slightly calcareous to calcareous soils, medium to medium-fine textured (clay loam, silt loam), not stony, well drained; dominant use cereals, subordinately vine yards, olives; dominant soils *Haplic Cambisols (Calcaric)*	S1	S2
	A) alluvial deposits, level (Holocene)				
26		A1	(in 2009 "A") alluvial deposits of the secondary rivers, with moderately deep soils, calcareous to non calcareous, medium-fine textured (clay loam), moderately well drained; dominant use cereals; dominant soils *Haplic Fluvisols (Eutric–Calcaric)*	S3	S3
27		A2	valley floor of the Orcia-Ombrone river system, not active**, with deep calcareous soils, medium-fine textured (clay loam, silt loam); moderately well drained; dominant use cereals; dominant soils *Haplic Fluvisols (Calcaric)*	S2	S2
28		A3	active riverbed of the Orcia-Ombrone river system**, mostly with a braiding hydrological regime, with deep, calcareous soils, coarse textured (sand), locally loamy, locally stony to extremely stony (pebbles) ; imperfectly to poorly drained; dominant use bare land; dominant soils *Haplic Fluvisols (Calcaric, Arenic) Haplic Fluvisols (Calcaric, Skeletic, Arenic)*	N	N

Fig. 3.18 View towards W over the "macigno" sandstone ridge, with the neat division in two morphological units: Lv -steep slopes, Lo -undulating broad tops (AA).

products more recent human intervention (Rattighieri 2016).

The woods and pastures are an interesting example: currently they are composed of oak and mixed deciduous woods, and of sclerophyllous shrubland (macchia). The former are to be found mostly on sandy hilltops and are dominated by two principal oak species, *Quercus cerris* and *Quercus pubescens*. The mixed woods are composed both of oak and hop-hornbeam (*Ostrya carpinifolia)* and are mostly associated with calcarenite limestone soils. As will be evidenced in further chapters, while oak woods and mixed woods formed an important part of the Roman-period woodlands, both their dominant species and their particular geographies were somewhat different from current patterns. Similarly, the predominant, sclerophyllous shrubby pastures—mostly dominated by meadow broom (*Bromus erectus*) and holly oak (*Q. ilex*)—are quite different in their composition than Roman period pastures, which owe their origins not only to geology, as they do today, but also to intensive human intervention.

Contemporary human agrarian intervention in the locale takes the form of not only arable agriculture, but also a renewed recent reforestation effort. Fodder crops and an expansion of viticulture represent a combination of small and large-scale agriculture which comprise some third of land use in the modern *comune*. Unlike neighboring Montalcino where the process began already in the Middle Ages, large-scale viticulture in our locale is largely a modern phenomenon (cf. Campana 2013:29). Furthermore, since the abandonment of large swaths of agricultural land in the 1970s, forest agriculture in the form of large pine plantations, coppicing, and chestnut plantations have also been on the rise.

3.4 Human Activity in a "Liminal" Landscape (KB)

This modular landscape with its alternating zones of open and closed topographies, has been only lightly shaped by human activity over the millennia in comparison with other nearby locales characterized by more intensive interactions. As a partial consequence, explorations of its human history have been infrequent and small in scale. The monasteries of San Salvatore al Monte Amiata and San Antimo, as well as the Aldobrandeschi and Giulieschi families all had properties in the project area, and their relevant archives contain, from the 9th c. onwards, mention of the region's various castles and other domains (Wickham 1989; Collavini 1998; Farinelli 2007). Architectural studies of some of its major monuments, such as the castles at Cinigiano, Monticello Amiata, Porrona, and Colle Massari are part of a long tradition of interest in the Tuscan Middle Ages and Renaissance. Indeed, Ghisleni's 2010 thesis, the first systematic archaeological study of the project area, grew out of a larger project at the University of Siena focused on medieval castle landscapes and their historical origins (Ghisleni 2010; Salzotti 2013). The area's Roman histories have thus been of less interest except as a prequel to the medieval centuries of primary focus.

Indeed, the lacuna of work on the area's ancient history is shaped and echoed by its ancient political liminality. Set at the furthest edge of the territories of two Etruscan cities—Roselle to the SW and Chiusi to the NE—it is not clear to whose territory, if any, our area would have belonged (Celuzza, Chirico, and Colombini 2015). Vetrulonia to the W was also active in the area, particularly after Roselle's destruction by the Romans in 294 BC. Our locale is closer and more topographically accessible to Roselle, and it is typically assumed to be part of its territory (Celuzza, Chirico, and Colombini 2015:344). However, as has also been noted, already in the Etruscan period the Monte Amiata region including its foothills acted as a shared cultural space where the limits of Roselle, Vulci, Volsinii, and Chiusi intersected and the *commune* of Cinigiano was part of an area where Chiusan and Volterran influences especially may have been felt (Celuzza 2013). As has been discussed above and more extensively in Chapter 17, neither the Orcia or the Ombrone Rivers act as real boundaries and movement is possible both towards Roselle and Chiusi. As the area dodges any clear territorial affiliation prior to Roman arrival, so, too, the 3rd–2nd c. BC Roman roads skirt it—the Aurelia runs to the SW along the coast, the Clodia to the W and the Cassia to the E. Indeed, like much of the other areas around Monte Amiata, our area lay outside the strongest attractor zones formed by cities and roads.

Three principal models exist to make sense of Etrurian territories in the early Roman period, whether they be coastal or inland, "central" or not

(Harris 1971:41–78; Torelli 1981:255–258). In the south, the survey around Cosa has posited a sharp break between Etruscan and Roman rule, with large population shifts in the 3rd c. BC, the arrival of veteran colonists in the 2nd c. BC, and a 1st c. BC quick take-over of their lands by large slave-run villas (Carandini et al. 2002). In northern Etruria, by contrast, a model of integration has been drawn from the Cecina valley survey near Volterra, positing strong continuity through the Roman arrival and the long-term survival of Etruscan peasants and villages well into the Roman period (Terrenato 1998). Finally, the inland areas near Chiusi have been interpreted through yet another lens: departing from a presumed expansion of freed peasants under Etruscan hegemony and assuming the slave revolts mentioned by Livy (33.36.1–3) affected this area particularly, this model attributes the expansion of settlement in Chiusan territory to a concession of rights and land to former slaves (Cristofani 1977; Rix 1977; Torelli 1981:263; Rastrelli 2000). Versions of these models have been applied to surveys throughout Tuscany, including our own and adjacent areas (cf. Cambi 1996:166; Botarelli 2004:188; Ghisleni 2010), often in the face of little supporting archaeological evidence. What follows below sets these models aside and considers how, or if, the traditionally posited attractor points near our locale (the cities of Roselle and Chiusi) may have impacted, or not, our area.

Roselle began a two-century long period of expansion, beginning sometime in the 2nd c. BC. In Roselle, these take the form of new *domus* and a new artisanal quarter. In 89 BC, the inhabitants of Roselle and its territory were granted Roman citizenship in the *Arnensis* tribe (Saladino 1980a:164, 174, 1980b:230–231) and after a hiatus, allegedly associated with the Sullan proscriptions, the city underwent its most expansive building period, with new structures in the center and northern hills. This phase has been associated with the establishment of a colony at Roselle, mentioned by Pliny (Pliny, *HN* 3.51). The construction of an Augusteon, restored houses, and a new forum have all been dated loosely to the Julio-Claudian period, leading to the assumption that the colony was established in time of Augustus. It is in the later 2nd and 1st centuries BC, too, that the first real signs of rural presence appear in Roselle's immediate hinterland, including a significant number of Roman villas around the gulf of Talamone, between Roselle and the mouth of the Ombrone (Cygielman 1998; Citter 2007; Vaccaro et al. 2009; Vaccaro 2011:14–16; Campana 2013:279–280; Celuzza, Chirico, and Colombini 2015; Campana 2017) and, although less well understood, extending adjacent to our own area into the *comune* of Paganico (Barbieri 2005a).

Although considerably farther away (probably two to three days' walk through hilly country), Chiusi may have played a role in the formation of our locale as well. As the largest Etruscan and Roman city to the E and its closest gateway to the Via Cassia, Chiusi is less well known archaeologically, but seems to have experienced a roughly similar Etruscan/Roman transition as Roselle. Although little is known of its urban form, scattered findings suggest an Etruscan heyday in the 4th to 3rd c. BC, when the city may have been a *foedus* of Rome, receiving a large urban wall circuit and drains. While it did not suffer destruction as part of Roman conquest, its expansion under Roman rule, like Roselle, did not really begin until the 2nd c. BC, while its monumentalization, including the possible terracing of the alleged forum, a civil basilica, and a restructuring of the urban plan have all been dated to the Augustan period (Paolucci 1998; Borghi 2002). The Chiusan territory has not been as rigorously surveyed as has the coastal areas, but the areas closest to ours near Monte Amiata have a very limited Etruscan presence and show a significant increase in small settlements, but no villas, beginning in the 2nd c. BC (Cambi 1996:151–175; Botarelli 2004:171–195).

In short, despite their different histories and the very different theoretical models used to understand those histories, both Roselle and Chiusi are marked by a dramatic increase in the settlements of their rural hinterlands beginning in the 2nd c. BC. Whatever its imputed political and social baggage, change, possibly quite fast change, would have marked the lives of peasants living in these areas. It is at this shared moment of change that the archaeology of our own area enters the story.

3.5 Human Activity in the Commune of Cinigiano (KB, MG)

Ghisleni's dissertation, upon which this project is based, employed surface survey, aerial photography and magnetometry survey (described more fully

in Ch. 2) to locate and map human settlement in the *commune* of Cinigiano (Fig. 3.20). Sometimes termed "total landscape archaeology" for the variety of approaches it brings to bear, this approach is, despite its name, often structured around specific historical questions—in this case questions about early medieval settlement patterns and locations.

The survey mapped some 467 topographic units, including sites and off-site scatters. The majority of these were of Roman date. No pre-Roman sites were found and the earliest surface material dated to the 2nd c. BC (Ghisleni 2010:80). This seeming absence of prehistoric and Etruscan sites is of importance: on the one hand, a survey intended to map early medieval settlement could be regarded as concomitantly blind to the traces of prehistoric archaeology. On the other hand, the intensiveness of survey required for difficult-to-find early medieval sites is analogous to that required for prehistory, so the absence of these earlier sites should not be regarded solely as a relic of the project methodology. Ghisleni, following the above-mentioned "Volterra" model, emphasized the "continuity" between Etruscan and Roman settlement (Valenti 1995; Terrenato 2007; Ghisleni 2010:81, citing Felici 2004). In the case of our locale, this is hard to sustain given the total absence of pre-2nd c. BC material. As one of the few survey projects to have excavated a series of these sites, it is also apparent that earlier material was not camouflaged by later occupation, either in small "farms" or in the locale's one villa. Thus, in sharp distinction from the regions to the north near Volterra (Terrenato 1998), south near Cosa (Carandini et al. 2002), and even adjacent in Paganico or Montalcino (Barbieri 2005a; Campana 2013:276–278), human habitation in our locale seems to have been largely archaeologically invisible until almost a century after the Roman conquests in the area.

What are the origins of these new signs of habitation? Two possible answers suggest themselves. The first is that there was always a robust population in this area, but it was archaeologically invisible prior to the expansion of Roman consumer culture, which made it newly visible (cf. Witcher 2011). To a certain extent this must be partially true, as we can hardly imagine a totally depopulated landscape when some of those immediately adjacent were heavily populated. The problem is made manifest by significant Etruscan presence just outside the modern *comune* boundaries on the W side of the Ombrone: a large Etruscan-Hellenistic manufacturing site (Barbieri 2005a; Sebastiani et al. 2018); a series of scattered tombs (Barbieri 2005a), and an Etruscan-Hellenistic tomb with some 16 cinerary urns (Campana 2013:166–167). These same Etruscan family names on the urns are found elsewhere, principally in the Val d'Orcia, but not in our area, suggesting that the Etruscan-Hellenistic rural world to which they belonged did not necessarily extend across the easy river crossing into our locale.

Thus, the second, more likely possibility is that our area was only sparsely populated. As noted above, our area sat at the very edge of the territories of two Etruscan cities. As such, it seems to have been peripheral to them and it may be no accident that the Etruscan remains described above lay on the N and W side of the Ombrone—inside the contested territory between Roselle and Vetulonia—while our own area has produced no clear Etruscan evidence at all. Indeed, the adjacent areas further E around Monte Amiata are similarly lacking Etruscan presence. In this scenario, the locale was an underpopulated, Amiatine "between," and only with the advent of Roman rule that diminished these territorial boundaries, and above all with the later 2nd c. expansion in the territories of both Roselle and Chiusi, did settlement take off.

Much of the archaeology tangentially addressing Etrurian Roman peasants has been centered on veterans settled as part of colonial foundations (Cambi 2002). As noted above, Roselle became a colony at some point, although its date and veteran population are nowhere given.[6] It seems doubtful that this colony was accompanied by centuriated units as no centuriation grid has been definitively identified (Citter 2007:26 n. 9 and 34 n. 74; Lazzaretti 2007:70) and, even if present, this would have clustered near the city and not extended as far inland as the project area. Thus, new Roman settlement in the locale might have been encouraged by a new colony but would have had a more ad hoc rather than regularized arrangement.

Of the datable Roman-period units located by Ghisleni's survey, some 260, or ca. 55%, were of late Republican/early imperial date—dated by the presence of Black glazed and/or Italic sigillata wares (Fig. 3.21). This surge is similarly documented in the adjacent areas inland in Montalcino, and SW towards Roselle and the coast (Vaccaro et al. 2009; Campana

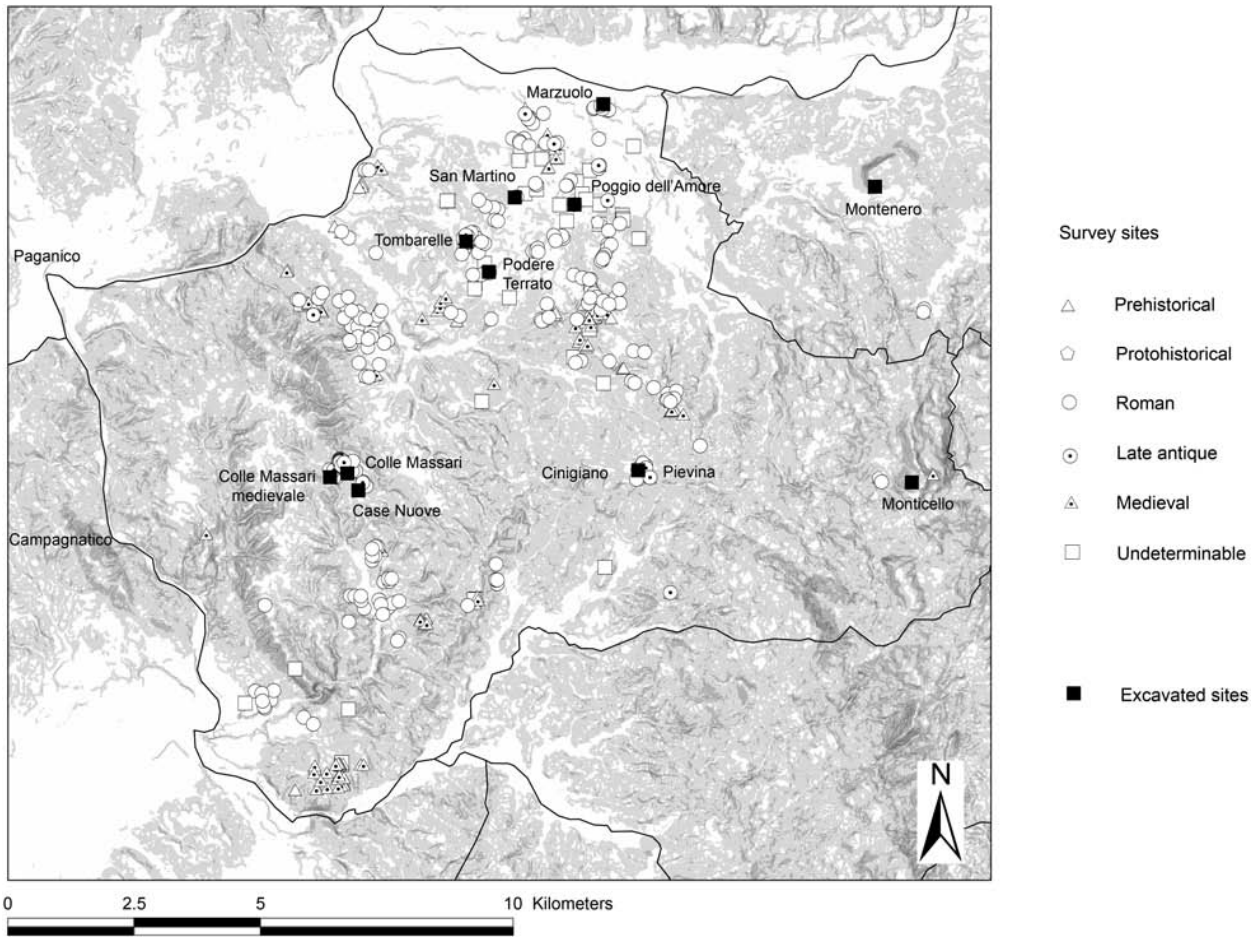


Fig. 3.20 Map of field survey results carried out by M. Ghisleni (2010) (AA).

2013:279–290). Ghisleni's fabric analysis of both coarse wares and tiles led to the isolation of a particular, late Republican/early imperial roof tile, distinct from later examples, which in turn aided in the dating of these sites. Of these late Republican/early imperial units, the majority was sites of under 0.05 ha of scatter or off-sites. The survey yielded only one villa, Santa Marta, which Ghisleni subjected to more detailed remote sensing and that has subsequently been subject to intensive excavation (Ghisleni 2009; Campana 2012–2014). Six other ca.1 ha+ sites were identified as "villages" on the basis of their atomized, dispersed scatter morphologies, and most of these had scatters identified as kilns nearby.

Like many regions of central Italy, the Cinigiano survey revealed a decline in sites during the mid-imperial period (cf. Barker 1995; Carandini et al. 2002; Vaccaro 2011:14–16; cf. Launaro 2011) (Fig. 3.22). As in adjacent areas (Cambi 1996:169–171; Vaccaro et al. 2009; Campana 2013:281–282) that decline in our area was precipitous. Only five sites with 2nd–3rd century ceramics were identified (one of these, Case Nuove, only after excavation), principally on the presence of mid-imperial amphorae. Except for Case Nuove, these were universally the largest sites found in the survey, including the Santa Marta villa, Marzuolo, Pozzuolo, and possibly Pievina.

Most of the few sites that yielded mid-imperial ceramics also produced materials from the 4th or 5th c. AD, while one site that had no evidence of mid-imperial occupation likewise had late antique wares, for a total of about ten distinct sites of 4th to 5th c. date (Fig. 3.23). Signs of late antique occupation included imitation ARS, amphorae, and a particular roof tile whose fabric allowed Ghisleni to date it to this period. Thus, the survey area showed a small uptick in sites during late antiquity, an uptick which included both small and larger sites, but almost always sites

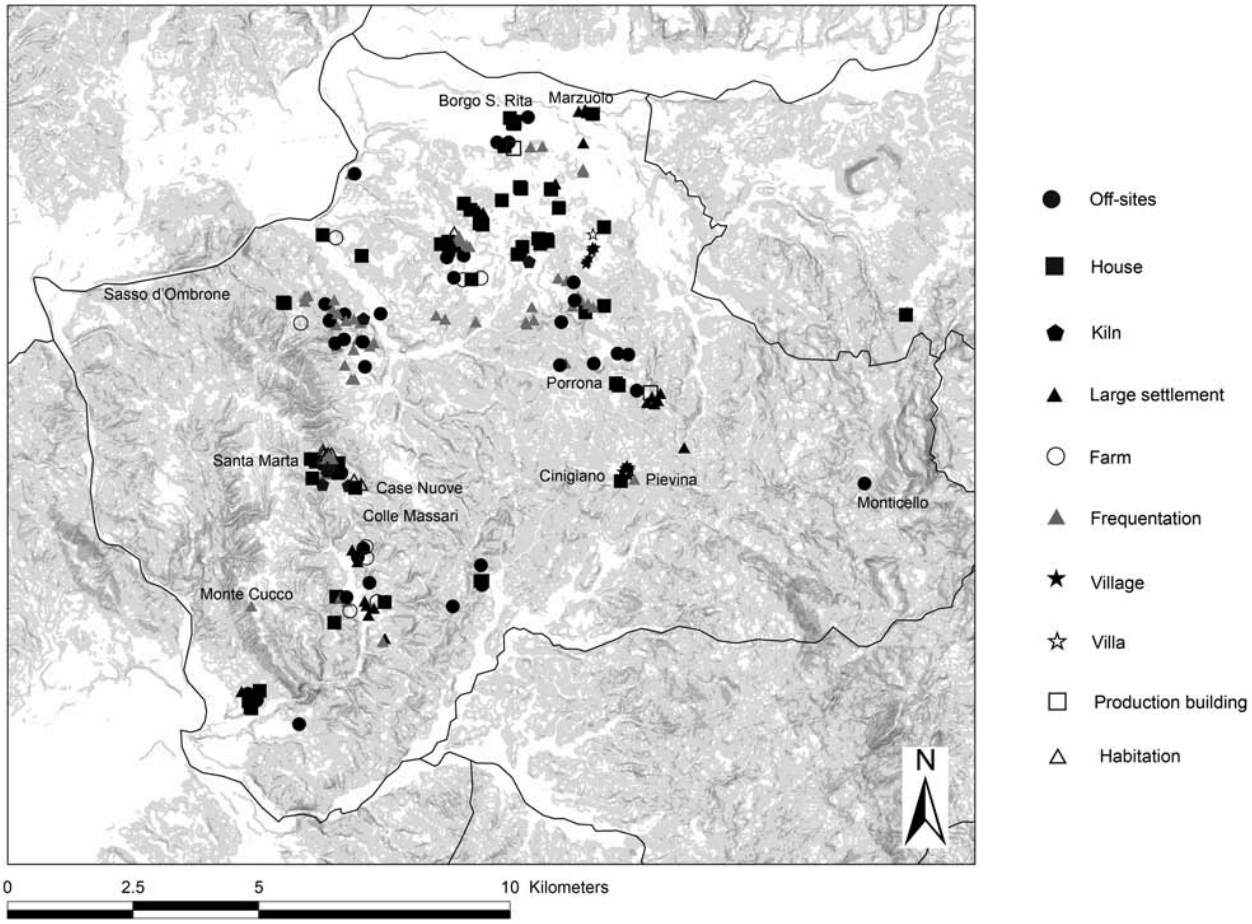


Fig. 3.21 Map of late Republican/early imperial-period sites from Ghisleni's survey (ERZ).

which had some earlier occupation. This pattern is quite distinct from areas around Cosa (Attolini, Cambi, and Celuzza 1982, 1983), where the villa-dominated landscapes began a slow but inevitable contraction, but bears similarities to the patterns along the lower Ombrone, Monte Amiata, and around Siena (Botarelli 2004:197–202; Felici 2004:222–225; Vaccaro et al. 2009).

Ghisleni's survey identified only one site of 6th–9th c. date, the villa of Santa Marta. Nearly a dozen 10th–12th c. sites were located, principally on fortified hilltops that are typical of the region's medieval settlement and become the sites of the first castles (Hodges and Francovich 2003) and their surrounding villages or *borghi*. In addition to these elevated sites, which seem to act as the locus of habitation for much of the next four or five centuries, Ghisleni also found an equal number (12) of lowland, small, dispersed sites. One of these, Colle Massari Medievale, was excavated by the project and will be the subject of a separate publication, while at Marzuolo we found a previously unknown 12th c. church that may have also been the center of a small settlement. Lowland, dispersed sites have only rarely been found in surveys of medieval landscapes and it has often been supposed that all habitation was focused in the fortified castle settlements until the 15th or 16th c when fortified lowland farms (*fattoria*) first appear. However, more recent work has suggested that in some regions, such settlements were a minority presence alongside elevated castles and supported a dispersed peasantry who lived in the same zones as their Roman predecessors (Vaccaro 2011).

Ghisleni was particularly interested in the discursive relationship between this *longue durée*, lowland-dominated archaeological landscape and the area's particular hydrology. As described above, permanent surface water is mostly limited to the larger

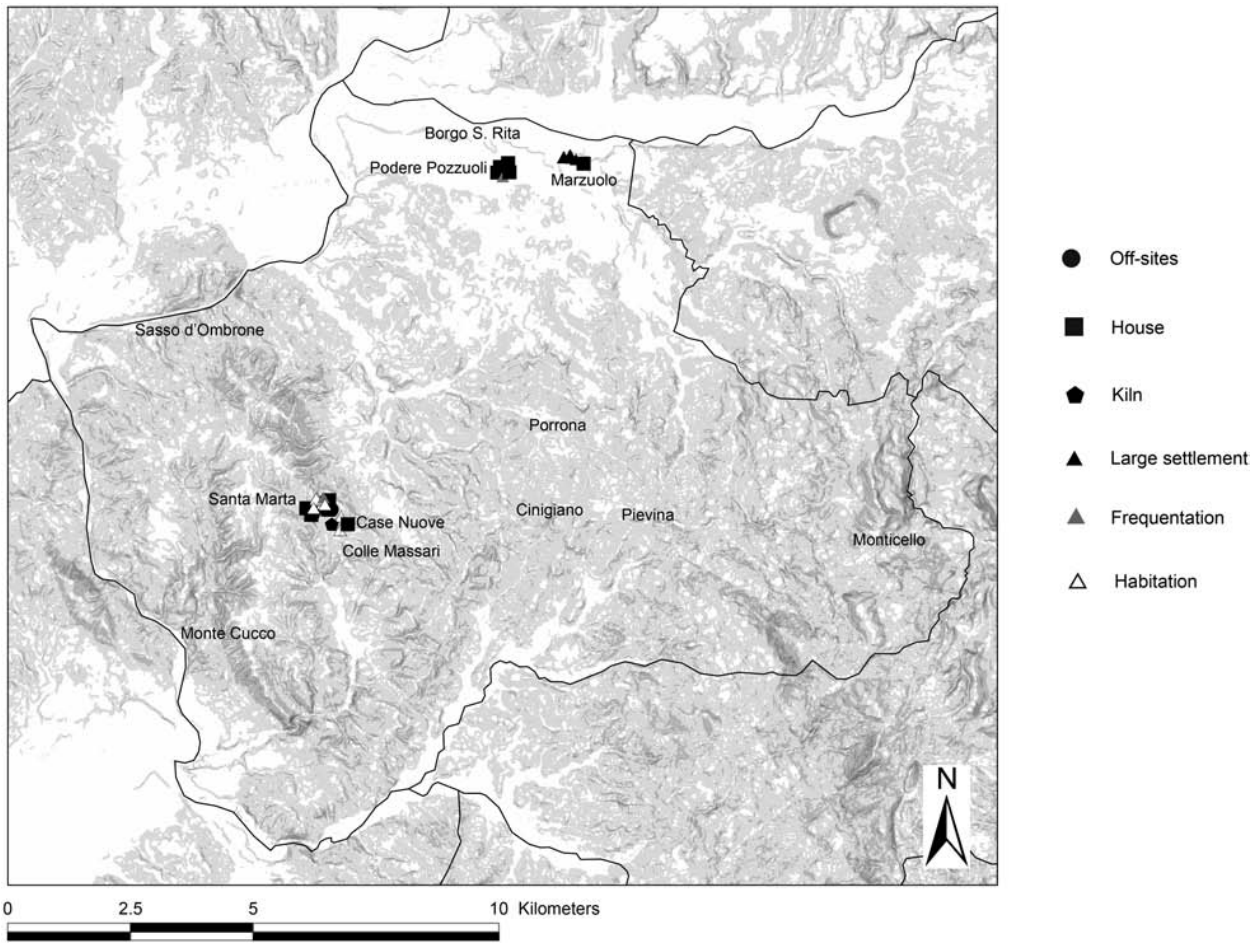


Fig. 3.22 Map of high imperial sites from Ghisleni's survey (ERZ).

Orcia and Ombrone Rivers, whose braided, constantly shifting banks discourage built uses. The area is rich in subsurface water, seemingly a product of the intersection of clayey and sandy geological patchwork. Ghisleni noted that much of the Roman life in the locale took place at these intersection points, making use of surface springs and seepage points (Ghisleni 2010:77–79). As Arnoldus notes above, the *fontoni* or surface pools that dot the locale may also be human-modified springs, expanded for stock watering and other purposes. As the following chapters note, the groundwater was both resource and challenge, and everywhere we find peasants making use of it, we find them simultaneously struggling to control its deleterious effects.

This medieval settlement pattern of elevated villages around castles with lowland farms (*podere*) seems to have persisted through to the 19th and early 20th c. (cf. Campana 2013:27). The early 20th c., however, saw the gradual immigration to cities and the advent of industrial agricultural, which would forever transform this landscape in ways that directly influenced our project. Not unlike the similar shifts towards urbanization and large-scale agriculture in the Roman period, this modern moment has been heralded as witnessing "the death of the peasant" (Hobsbawn 1996:289) and Tuscany, albeit slowly, experienced many of its presumed death throes. In our locale, the most emphatic of these was the end of the *mezzadria* or medieval sharecropping system with land reforms of 1950 (Massullo 1991). In the Maremma up to and including parts of the Val d'Orcia, these reforms offered large landowners attractive sums for their estates, which were then broken up and offered to former sharecroppers as leasees-cum-owners of small farms (*podere*).

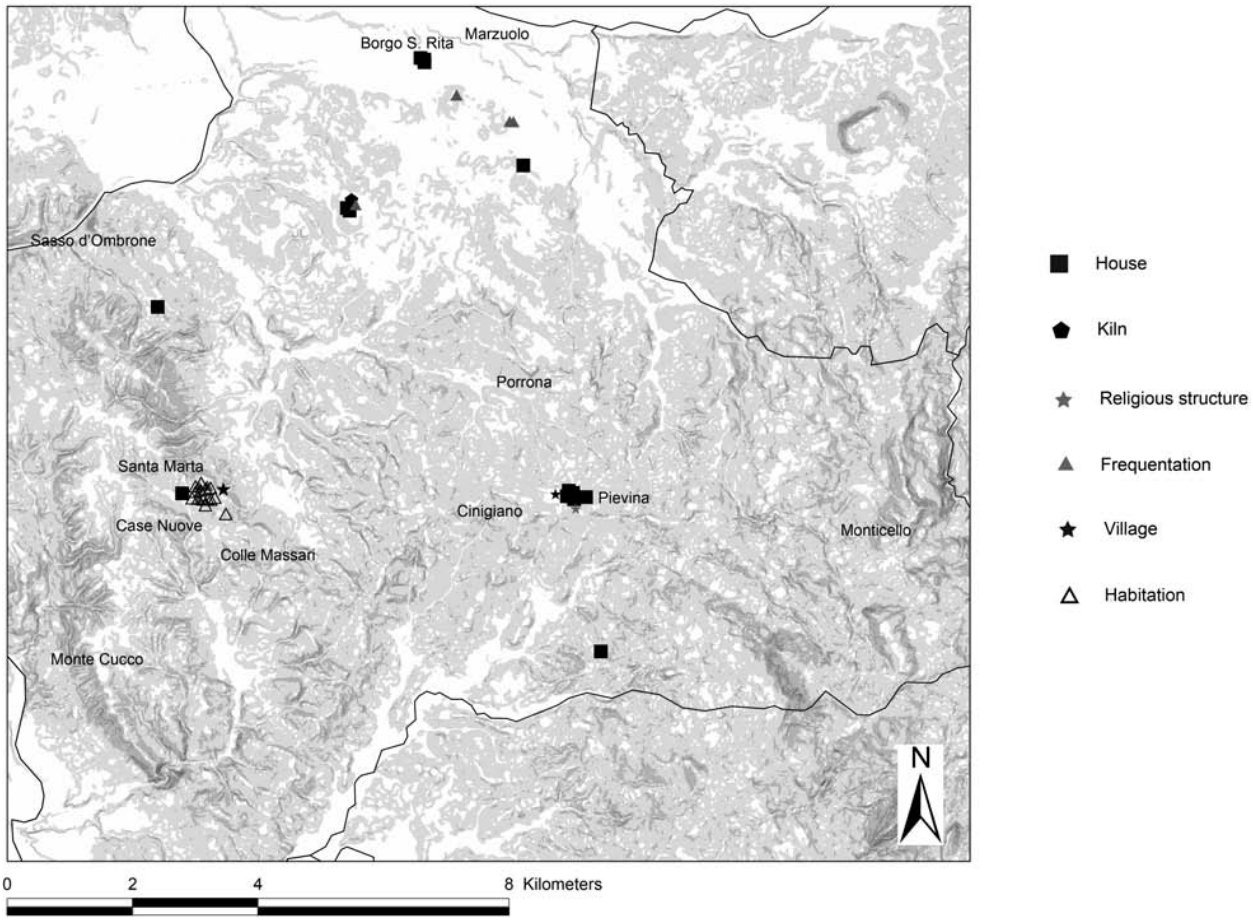


Fig. 3.23 Map of late antique sites from Ghisleni's survey (ERZ).

Intended to quell Communist peasant uprisings by transforming sharecroppers into landowners, the resultant "podere" or small farms produced a new peasant landscape: physically occupying new areas, thrust into new relationships with external markets, land-reform peasants were part of a euphoric rural moment (Gaggio 2017:64–109).

It was a moment that would not last. In the two decades after the reforms Tuscan agriculture lost two-thirds of its workforce to the cities, a rural exodus that produced the empty landscapes one encounters today. This landscape consisting of a handful of still-extant great estates, interspersed with the still operative land-reform *podere*, strongly conditioned our own interactions with the landscape. Most of the sites excavated by the project were either on the land of small *podere* owners—Podere San Martino, Poggio dell'Amore, Podere Terrato, and Tombarelle—or on land owned by large-scale castle-estates—Case Nuove and Colle Massari Romano, both on the lands of the Colle Massari estate. The continued cultivation and thus plowing of land either by small landowners, in the case of the *podere*, or by large scale farms in the case of Colle Massari, meant good visibility for field survey, and a preponderance of sites discovered on these kinds of properties. This bias continued to our own excavation projects which focused on those sites which had both good visibility and on-site proprietors with whom we could work.

A post-rural exodus *mentalité,* in Tuscany generally and in our locale particularly, has also engendered a kind of peasant essentialism as a means of tying land to people, past to present. The expansion of peasant museums in dozens of rural Tuscan towns, which we visited both to understand their genesis and to see their artifacts, reclaims the lost peasant world as an emblem of authenticity in a newly tourist-oriented rural economy (Gaggio 2017:195–237).

Tuscan landscape archaeology, too, tends to preference narratives of continuity as a basis for the idea of "patrimony," a stasis which, as we found, is at odds not only with the archaeology but also with the radical changes those very landscapes have undergone in the recent past.

3.6 Characteristics of the Locale (AA, KB, MG)

The synergistic relationship between human activity and landscape has yielded a locale with particular properties, many of which are probably common to other Maremma landscapes, but which we documented for the first time. In other words, the collision of a particular patchwork landscape with its attendant hydrology and topography, together with two and a half millennia of human activities in that space, has yielded a locale—the unity of landscape and human activity—that has a particular set of qualities. These qualities would emerge as central at every turn of our own explorations of the lives of Roman-period smallholders in the locale.

One basic property was the five quite different zones inside the project area (Ghisleni 2010; Grey et al. 2015) (see Fig. 3.17). The hillier, forested areas to the E and SW (Zone 3 above) with its elevated medieval sites of Monticello Amiata and Cinigiano itself were hard to survey, had seemingly a thinner Roman presence, but were tied to the adjacent areas by ridgeway routes and the different ecological niches offered by mountain slopes. Connected to it, but nonetheless distinct was the western section of this Zone, where the older geological substrates produced thinner, stonier soils. The region's only villa, Santa Marta, was found here and would have seemed isolated in its valley except for the ridgeway that provided outlets to east and west. The central zones (Zone 1 and 2), had a different human-landscape history: formed by the flat Orcia River terraces and adjacent Upper Miocene–Pliocene clays, soils were rich, modern *poderi* are common, and, thus, the landscape was readily surveyed. Roman settlement was thick on the ground and the area open via the river or land routeways to connections with the coast and areas west.

A particular feature of this central sub-locale was the matrix of geology/hydrology and settlement. As Ghisleni's thesis revealed, a majority of Roman-period sites in the project area were situated at geological intersections of sandy and clayey deposits. As noted above, Zone 2 particularly is characterized by Upper Miocene–Pliocene deposits consisting of sands, sandstones and conglomerates, covering marls and clays. In many areas these layers are tilted, groundwater tends to accumulate at the impermeable clay/permeable sand border, and as a consequence appears on the surface or near surface as springs or *fontoni*. As Ghisleni's project demonstrated, human settlement in the Roman period strongly preferenced these interface areas. Human activity may have further enhanced these upwellings by broadening and deepening them, forming the surface pools that remain today.

Many of the sites excavated by the project were likewise located at these interface zones. Almost all of the following site reports reveal a complex relationship with groundwater. Much richer than simply an environmentally determined placement of human settlement near water, the excavation data finds peasants attempting to alternately channel and expand access to groundwater, or banish or limit it, while in some cases, as at Podere Terrato or Pievina, they seem to have been undone by it. Positive or negative, this interaction between human activity and sub-ground water is part of the particularities of the locale's history.

Concentrated, but not limited to the central locale is a similarly complex relationship between clay, agriculture, and industry. As noted above, the younger Upper Miocene–Pliocene geology of the central sub-locale and the Pleistocene–Holocene river terraces yielded a series of rich clayey soils. As also noted above, Roman settlements of all kinds are thick on and around these clays. As will be described more fully in Chapter 13, when we began the project, we assumed this relationship was a simple one: rich clay soils were better for cereal agriculture and the sites of the river terraces and central zone were placed there to engage in cereals production. We had neglected to consider the "weight" of these soils, which modern farmers described as still particularly difficult to plow especially in the winter plowing seasons when these soils become waterlogged and even heavier. The rich clay landscapes had a consequently much more diverse history: cereals were grown here, but only in specific, limited

moments. Instead, pasture seems to have predominated in most portions/periods, and, at two sites in the sub-locale, we discovered one and probably two installations engaged in the production of pottery. Again, what we initially assumed to be a simple deterministic relationship between soil quality and land use was shown to be far more complex and conditioned.

A final particular property of the locale was its potential movement patterns. As noted above and developed in Chapter 17, movement within the locale and movement out of it, was conditioned by topography but not limited by it. Again, hydrology and its attendant implications play a major role: deeply incised rivers like the Melacce, Trisola, and Ribusieri form barriers to movement in the upper parts of their courses, while the Orcia and Ombrone occasionally produced flat river terraces that encouraged movement along and permitted movement across, at least at particular places. Those places emerged from our study as "focal points," tangible expressions of the collection of decisions and actions that dwelling in this landscape entailed. The rolling hills that interrupt the central sub-locale are likewise both barriers and conductors of movement: while they interrupt movement north-south, their ridgetops seem to have acted as a relatively flat routeway that stretched across the whole of the locale to exit at Paganico. Furthermore, the seasonal rivers that bisected the flat plains imparted a rhythm to movement around and beyond the bounds of this locale, readily permitting traversal in warmer, dryer months, but serving as much more significant barriers to movement at other times of the year.

Human settlement seems both to have been guided by and to have pushed back against these hydro-topographic features. The central zone, heavily bisected by small *torrenti,* is nonetheless thick with human presence. As the data from San Martino, Poggio dell'Amore, and Chapter 17 show, those human spaces were constituted out of perpetual movement and connection. The hillier western parts of the project area collected Roman settlement in valleys connected by ridgeways; the site of Case Nuove was selected for use, we argue, precisely because it was visible from all these visually isolated places and because it lay on an intersection of these routeways. Here again, a bisected hydro-topography is manipulated to exploit and produce nodes of connectivity.

3.7 Conclusions (KB)

In the concluding chapter of this book, we will consider at length the representativeness of the results of this project. In many ways, the locale itself encapsulates this question. In its mosaic-like geology that repeats all over Tuscany and in the broad arc of its human settlement, particularly in the Roman period, the project locale looks much like other areas of central Italy. In other respects, it looks somewhat different—distinct from the more densely settled coastal area, distinct from urban hinterlands with their long, pre-Roman history of human habitation, neither a mountain pastoral landscape nor coastal littoral, but something in between.

As neither particularly central nor particularly remote, as a mix of sub-locales with different movement topographies, settlement histories, opportunities, and challenges—that is, in both its diversity and its non-specificity—the project locale is probably more representative of most Italian Roman locales than not—a kind of Roman "anywhere." What we hope to illuminate in the following chapters is the heretofore untold history of non-elite experience in this "anywhere," and how the intersections of soil and industry and travel and groundwater and countless other particulars constituted the minutiae of a daily experience lived in intimate connection with the land.

NOTES:

3.1 Throughout, see the 1:100,000 geological maps of the *Servizio Geologico d'Italia* (1967), sheets 128 and 129, as well as to the map and text of Lazzarotto (1993) with references cited therein, and to Jacobacci et al. (1967), Motta (1969), and Società Geologica Italiana (1993). Also available now are the new CARG project geological maps in scale 1:10,000 of the Regione Toscana, see: http://dati.toscana.it/dataset/carg.

3.2 The geological chronologies mentioned on these pages are: Tertiary, a former term for the geologic period from 66 million to 2.58 million years ago (Mya); the Upper Tertiary or Neogene, divided in: Miocene from 23 to 5.3 millions of years ago and Pliocene from 5.3 to 2.6 Mya, and the Quaternary period divided in: Pleistocene from 2.6 Mya to ca. 12,000 years ago and Holocene from ca. 12,000 ya to present.

3.3 The *Flysch* facies is deposited during an early stage of mountain building, by marine mass movements in deep

water. It consists of repeated sedimentary cycles with fining upwards of the sediments. The following geological formations belonging to the "Eastern" uplifted block crop out within or adjacent to the mapped area; they belong mainly to the *Flysch* facies: 1.the "argilloscisti" formation ("galestri e palombini"), alternating thin bedded fine grained layers and coarse banks of limestones and marls; 2. the "argilloscisti varicolori"; 3. quartz-calcareous sandstones of the "pietraforte" type, locally with lenses of very small pebbles. Within or near the mapped area, the "Western" older block, is mainly made up of: 1. formations of the *Flysch* facies: light colored, more or less compact marly limestones ("alberese"), marly shales, and more rarely "argilloscisti"; 2. quartz-feldspatic sandstones and sand-schists ("macigno"), grey to yellow, assigned to the Lower Miocene part of the "Serie Toscana".

3.4 On the more recent 10K geological maps, a large part of the clayey formations formerly identified as Pliocene or "Mio-Pliocene," have been assigned to the upper-Miocene. On the geological maps of the single sites here presented they are referred as "Mio-Pliocene clays."

3.5 On the various classes applied, see Arnoldus-Huyzendveld and Pozzuto 2008; USDA 1993.

3.6 Celuzza, Chirico, and Colombini (2015) provide some hypothetical numbers of veterans and sizes of plots, noting there is no evidence for either, nor for centuriation.

4

Pievina[1]

4.1 Situation (AA, MG)

The site of Pievina lies mid-slope on a low hill sloping from SE to NW, in a rolling landscape made up of clays and fine sand (Fig. 4.1; see also Color Fig. 4.20). At the bottom of the hill to the W was a modern *fontone*—a shallow, probably man-made depression to collect water, common in Tuscany and set near less permeable terrain belts that collect groundwater from aquifers located uphill (Arnoldus-Huyzendveld 2008 and see Ch. 3 above). A spring was reported, but not located, uphill to the SE. These two factors—the slope and the nearby presence of groundwater—emerge as major factors in the site's history. The site's nearest Roman neighbor lies 1.5 km to the NE, a near twin to Pievina in size, chronology and surface aspect. Numerous neighbors lie to the NW (Fig. 4.1).

4.2 Remote Sensing (MG)

Surface survey revealed seven discrete scatters of material (TU 285–291) totaling 1.5 ha, with a scatter density of ca. 5–10 fragments/m^2 and loosely organized in a circle with a large space empty of material in the center (Fig. 4.2).[2] All of these scatters produced material datable to the 1st c. BC to 1st c. AD, including fragments of Italic sigillata Conspectus 34 and Black glazed ware (non-indicative). One sherd of Italic sigillata was later found to derive from another project site, the ceramics production site of Marzuolo (see Ch. 10). Over-fired tiles of late Republican date were found spread over several scatters, possibly pointing to the presence of a tile-kiln, but not indicating its precise location. No material of 2nd–3rd c. date was found. In the 4th–5th c. AD, the site again produced evidence of occupation, but only in TU 290, 291, 286, and 287: Forms Hayes 59 and Hayes 91 in African red slip ware were found alongside imitations in Color-coated ware of the Tunisian prototype Hayes 61 and other both open and closed forms in Color-coated ware. In its first phase, the site resembled the other agglomerated 'villages' located in the survey, while in late antiquity, the site seemed to have shrunk and was labeled a house or small farm.

Geophysical survey at Pievina utilized two different instruments: a Foerster 4.032 and an Overhauser GEM (GSM-19GW), the latter in walking mode. As the far N and W parts of the site sloped considerably, only 1 ha was surveyed. The Foerster survey was largely unsuccessful, showing very little variation in the plots. The GEM survey, however, located several clusters of anomalies, all but one of which overlapped at least in part with the surface scatters (Fig. 4.3). The exception was a particularly intense dipole in the site's center, whose concentration and strength indicated a kiln. Beneath TU 286, a possible linear anomaly running NE-SW was joined by a line of more fragmented anomalies running at right angles, possibly suggesting the outlines of a building.

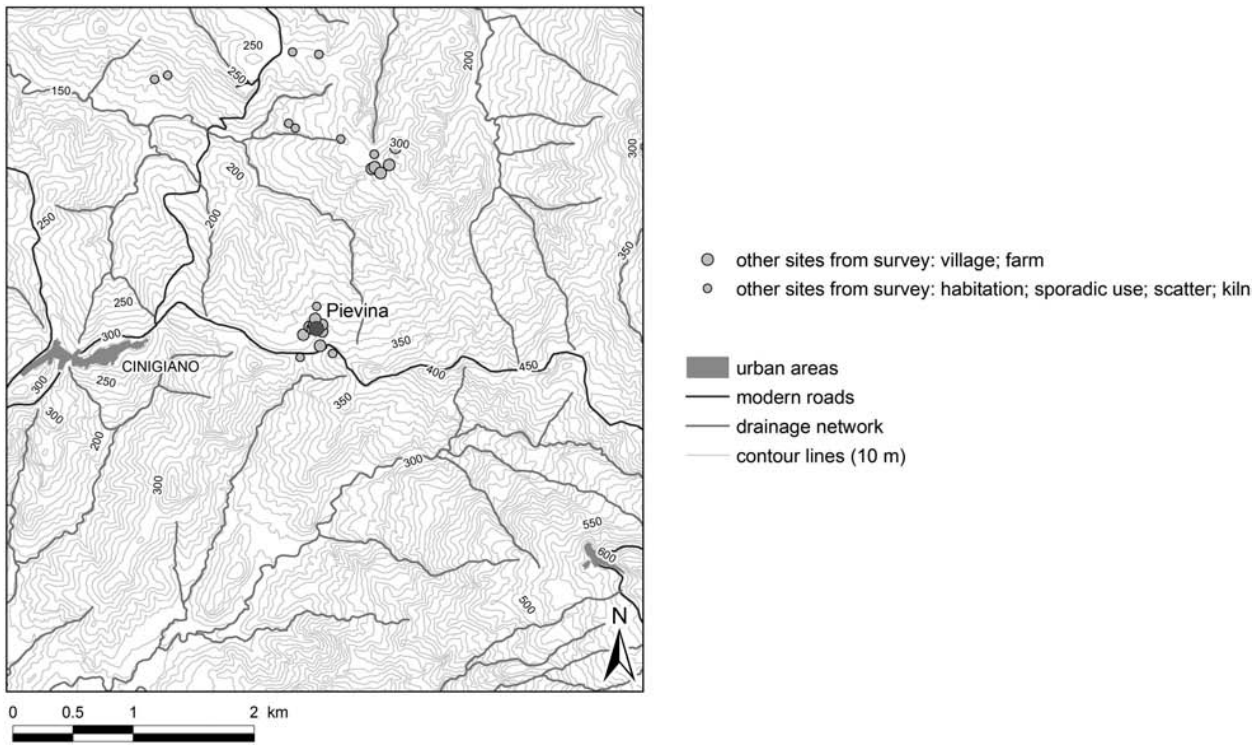


Fig. 4.1 Pievina, general topography and Roman sites (AA).

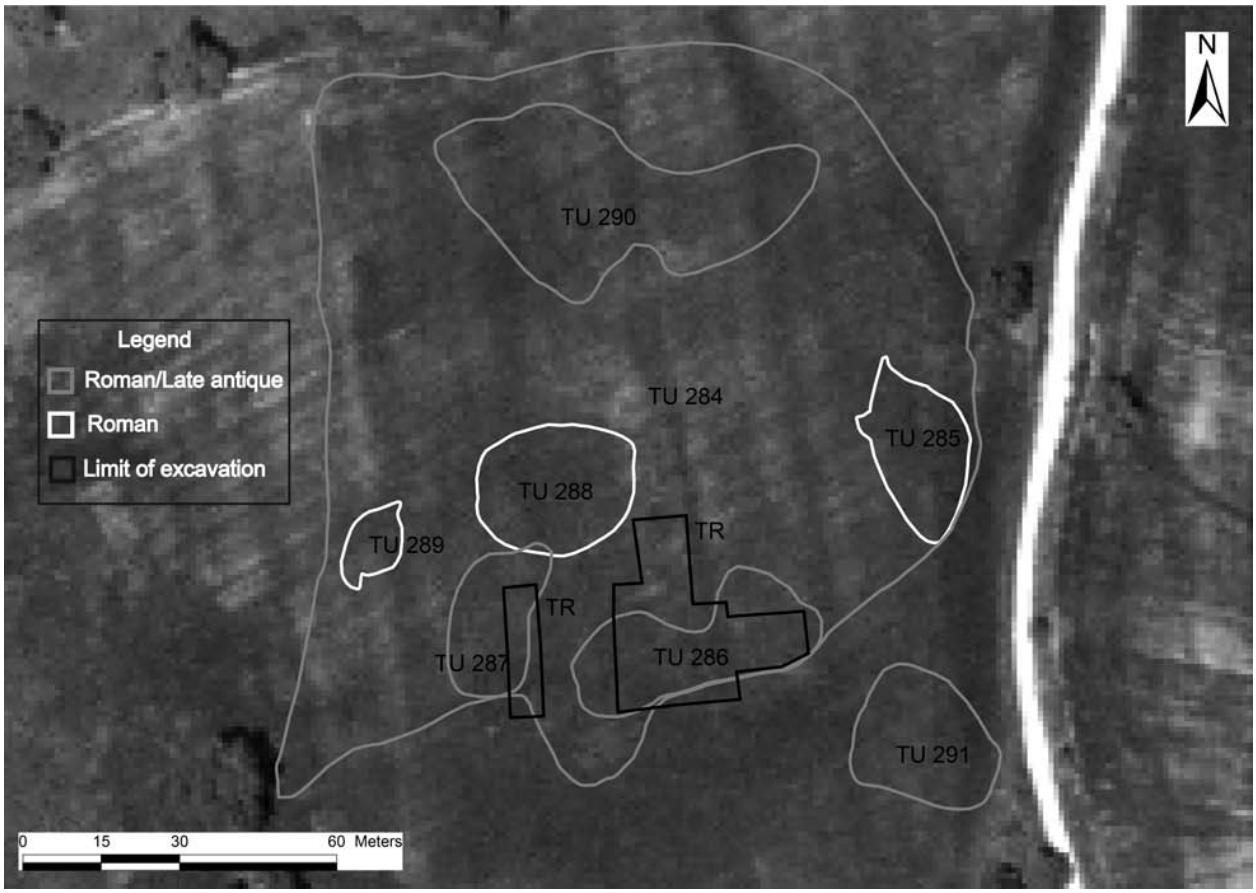


Fig. 4.2 Pievina, survey surface data (ERZ/MS).

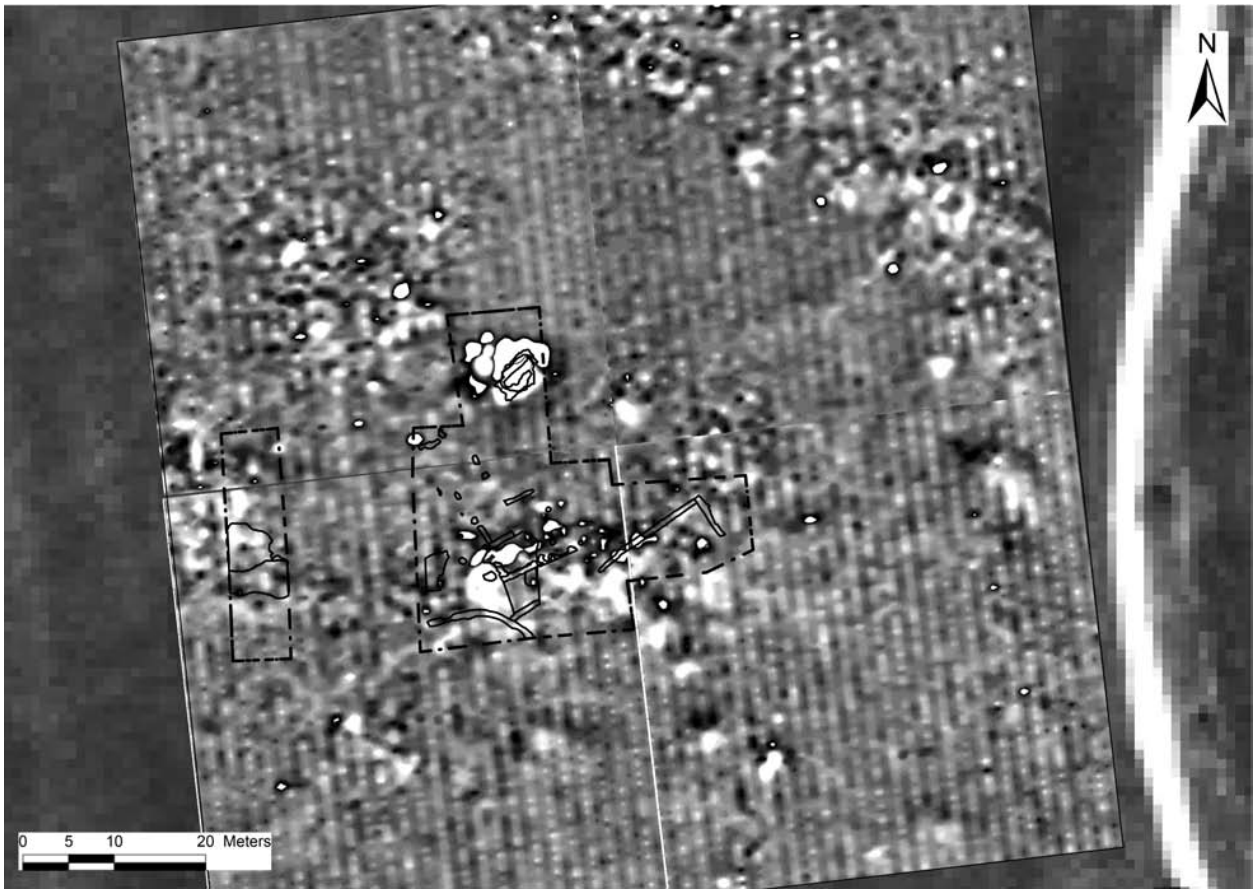


Fig. 4.3 Pievina, remote sensing results (GEM magnetometry survey) overlaid with excavated remains (ERZ/MS).

4.3 Excavation (KB)

Two areas were selected for excavation (Figs. 4.4 and 4.5), corresponding to TU 286 and 287 and comprising some 930 m². Efforts to extend the excavated area to the south were scrapped after groundwater was encountered. Areas to the NE, NW, and SE that produced strong anomalies and the other scatters not covered by geophysics were not excavated. The implications of having excavated only about 21% of the surface scatter area (ca. 4,450 m²) are discussed below.

As the surface data suggested, the site included major periods of occupation in the 2nd to late 1st BC and 4th to 5th c. AD, separated by a hiatus during the 2nd to 3rd c. AD. The presence of a kiln in the first phase was confirmed. However, excavations revealed that the designations applied to the site—a late Republican "village" and later "farm"—were found to be somewhat misleading.

Phase 1: Structures 1–3

The interpretation of this phase (Fig. 4.6) was hampered by the presence of groundwater at high levels in the E, the poor degree of preservation to the NW, and the development of the late antique settlement immediately over the site to the SW. To the E, two sides of a large, well-built masonry structure (Structure 1) were revealed, built of double-faced walls (SU 1002 and 1010) 0.6 m wide. To the W of this, a line of geophysical anomalies, running parallel to the structure's E wall, may indicate the third wall of what was a possible rectangular structure measuring some 14 x 7 m, but groundwater prevented excavation of its full extent. A 2.5 m deep trench in the presumed inside of this structure failed to reach either a floor or the bottom of the walls. These facts, in combination with the insertion of a drain channeling water into the structure's interior (Fig. 4.7), the much higher occupation levels of contemporary date to the W, and the occasional presence of *opus*

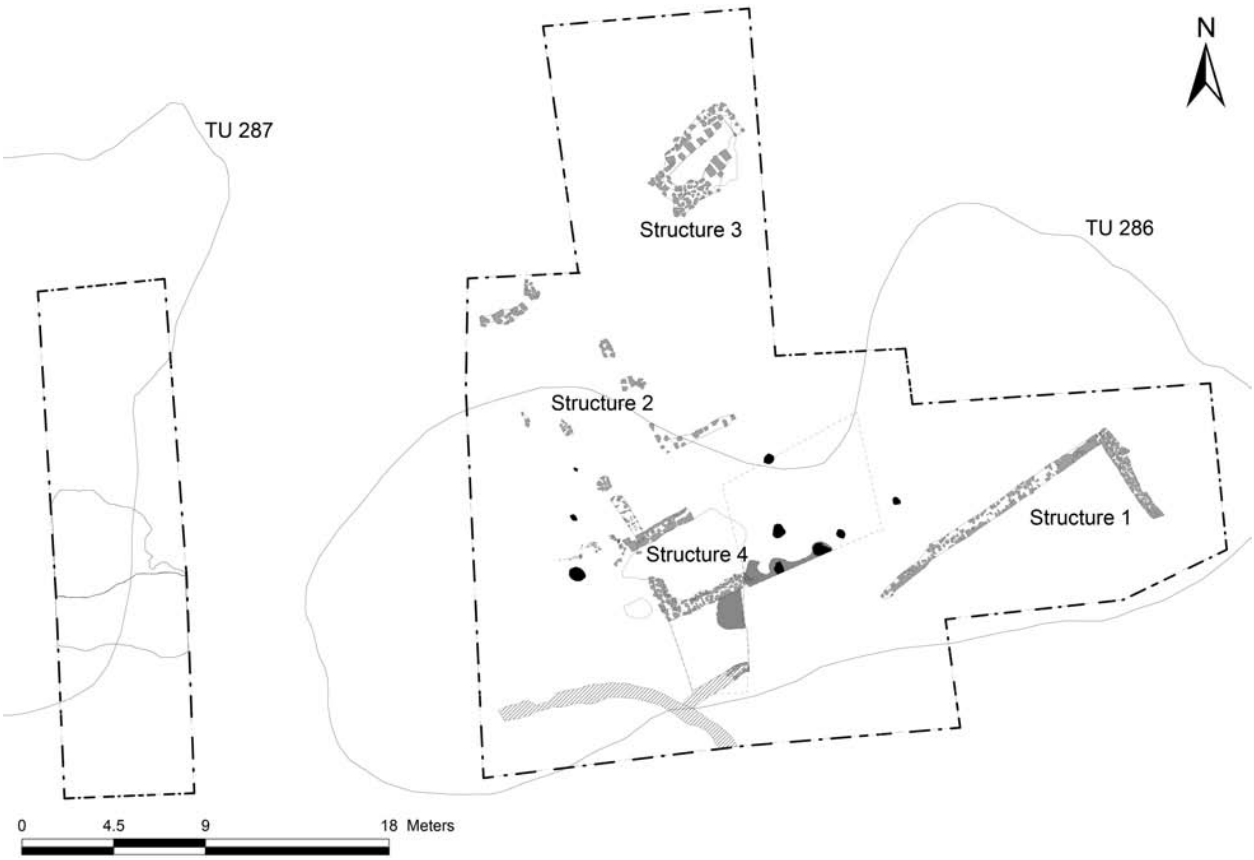


Fig. 4.4 Pievina, overall site plan (ERZ/MS).

signinum fragments inside the trench, all suggest a cistern.

The area to the NW was much disturbed by plowing and no occupation levels were found. A second wall, more or less parallel to Structure 1, and of similar mortared construction (SU 1503), lay at the SE end of a double line of piers, built of dry-stone masonry. A capping wall of dry-stone masonry terminated this structure at the N. A single posthole (SU 1557) found near the W piers seems to be broadly contemporary.

With its double line of piers and the absence of continuous outer walls except at its short ends, this building (Structure 2) was identified tentatively as a raised-floor granary, measuring 12 x 5 m. While the plan varies from the better known large-scale granaries in Italian villas (cf. Van Oyen 2015a), the double row of bases are typical of all granary forms in the western provinces and served to support elevated floors, beneath which air could flow and permitting the floor to be raised above water and pests (cf. Ferdière 2015, Type 1; Salido Domínguez 2017:64–73). We thus imagine the piers to have supported a wooden floor, all traces of which were destroyed by plowing; while the absence of large quantities of building stone and the occasional discovery of thick, green clay between the stones of Structure 2 suggest pisé walls built atop a socle of rubble.

The different construction technique of SU 1503, built in mortar, suggest an earlier wall, reused in the construction of the otherwise dry-stone granary, while the function of an L-shaped extension on the building's east side remains unclear. Indeed, some stones in the piers, as well as the prop stone in the single posthole (SU 1557), were broken millstones (see also below). This fact, plus the very different construction character of the building's south wall (SU 1503) may indicate that Structure 2 replaced an earlier building, possibly a granary or mill, and made use of one of its walls. No other trace of this earlier structure or its stratigraphy were found.

To the W of Structure 2 lay an open area, in which was found a hearth (SU 1530), built into half

Fig. 4.5 Pievina, aerial view with students for scale and showing major features (PN).

of a reused dolium and cut into a packed surface. The fill (SU 1542) was rich in charcoal, uncharred faunal remains, cooking pots and some Black glazed ware. The fact that the faunal remains were not burnt may suggest that all or part of this fill was a secondary rubbish deposit, dumped in the hearth after its abandonment.

To the N of Structure 2 was a kiln (SU 2005, Structure 3), as indicated by the geophysical data (Fig. 4.8). The kiln was roughly rectangular, oriented NE-SW, its opening in the SE corner. Partly covering the SW corner was a sizeable dump (SU 2003), containing large chunks of carbonized wood, broken and over-fired roof tiles (*imbrices* and *tegulae*), as well as ceramics associated principally with cooking and storage (see below). The kiln itself was completely empty, and, although no definitive wasters were found, the large number of broken and over-fired tiles in the dump suggest its primary use was for tile production, while the other ceramics probably derive from a nearby (but unlocated) domestic context.

The abandonment of this phase seems to be associated with a geological event. A clayey deposit (SU 1004) filling Structure 1 seems to have been part of a localized, but significant, colluvial event, probably a landslip detected just to the west of the excavated area. The east wall of Structure 1 (SU 1010) was angled steeply down, while its corner jutted up, a displacement seemingly resulting from the differential distribution of the weight of the clayey colluvium.

Fig. 4.6 Pievina, plan, Phase 1 (ERZ/MS).

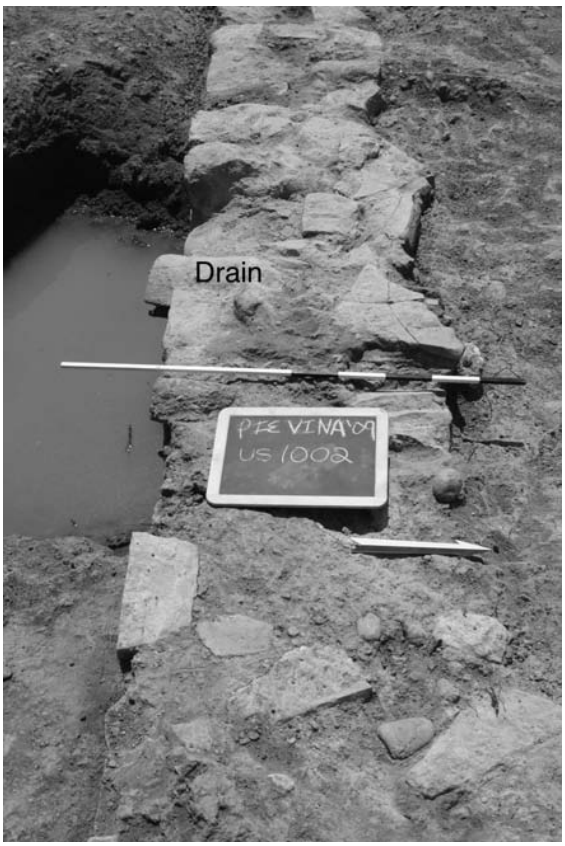


Fig. 4.7 Pievina, view of Structure 1 with drain, from E.

Phase 2.1: The construction/use of Structure 4

The colluvium that filled the cistern extended over much of the SE part of the site and a late antique stratum covered Structure 2, suggesting that this, too, was in ruins (Figs. 4.9 and 4.10). The reoccupation was focused in the western parts of the site and consisted of the reuse of one wall of Structure 2 to build a new building (Structure 4), the laying-down of a succession of large beaten-earth surfaces, and a system of drains.

Structure 4 was begun with the laying of a beaten earth floor (SU 1025) packed with broken tiles, clay, and small pebbles against the earlier wall (SU 1503). Two wall socles, composed of unmortared river cobbles, were then laid on top of this floor to form a roughly square structure, measuring 4.3 x 4.5 m, open to the E and with a doorway to the W. The upper walls were again seemingly constructed of pisé, found collapsed over the floor. To the east extended a floor (SU 1031) of somewhat coarser matrix but seemingly contemporary construction, while postholes continued the line of the structure's S and N wall, with a large posthole in the center of the coarse floor.

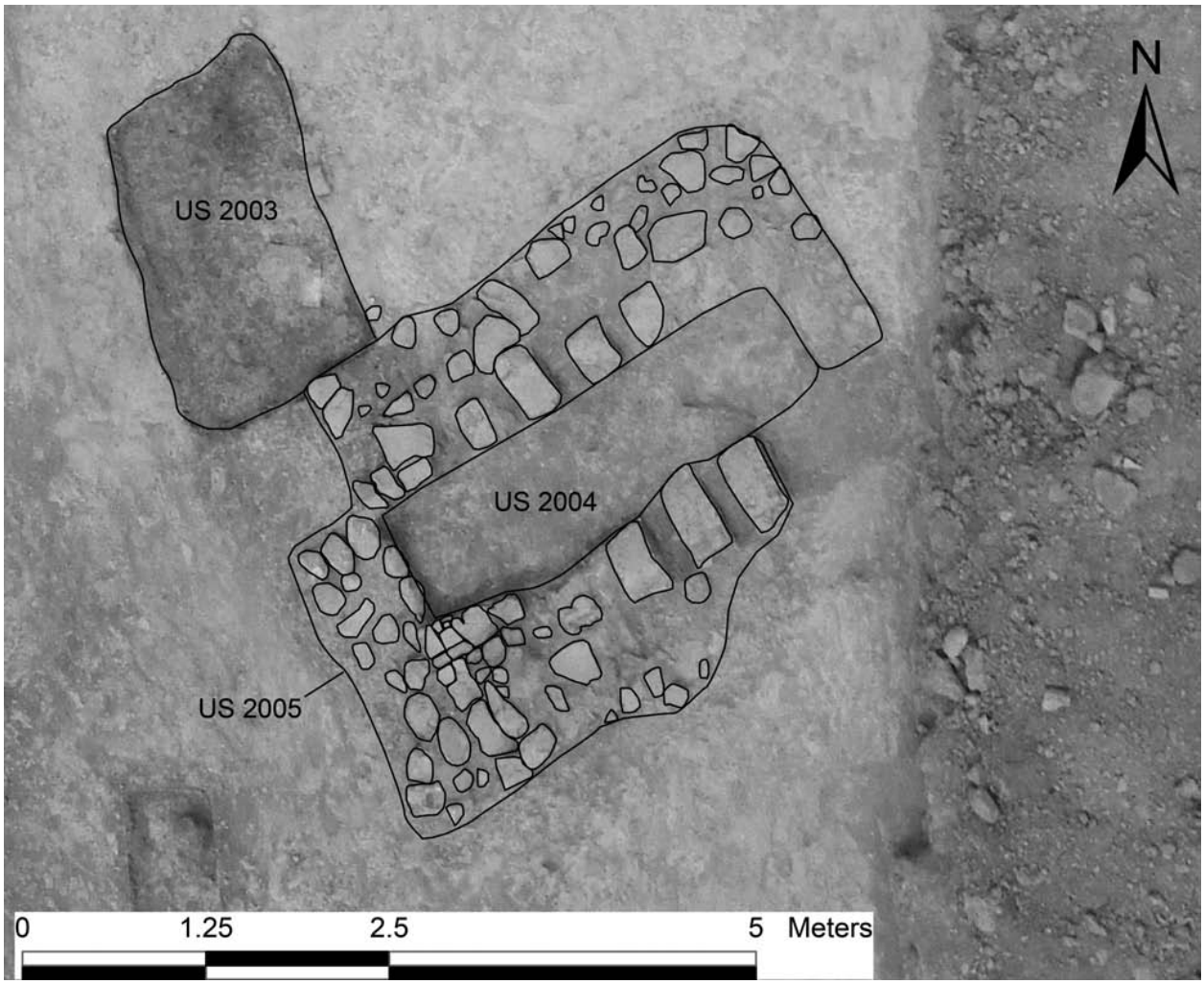


Fig. 4.8 Pievina, aerial view of Structure 3, kiln (PN).

It would seem that Structure 4 was conceived from its beginnings as a mixed-technique structure, with a W "wing" (4.3 x 4.5 m) of cobble-socles and pisé walls and an E "wing" (5.5 x 4.5 m) in wood for a total structure size of 9.8 x 4.5 m. Possible signs of a wall cut running between the posts were traced on the S side, but not on the N: thus, it remains unclear if this post-built extension was open or closed to the elements. As the remains of the tile roof were limited to the W wing, it may be that the tiled sections were limited to that portion, while a perishable roof, perhaps of straw, was built over the post-built eastern part.

No installations were found within Structure 4 that provide a clue to its function. The abandonment contexts produced a wide functional range of domestic ceramics from fine wares to storage and transport vessels, providing no real functional indicators. The construction distinction between the tiled 'wing' and the post-built 'wing' might suggest different functions, particularly if the post-built wing were open to the elements: the post-built wing might have been used to house animals or for storage, for instance. We ultimately labeled this structure a 'house' with some reservations, discussed below (Fig. 4.11).

To the S of Structure 4, and seemingly part of its original construction or attributable to a moment soon after, lay a series of drains (SU 1527 and 1528). These were composed of medium-sized river cobbles laid in two parallel lines covered by larger cobbles that acted as a cover and filter (Figs. 4.12 and 4.13). Contemporary farmers interviewed still construct drains in this manner—termed in Tuscan a *draino*—both for water channeling and to mark field

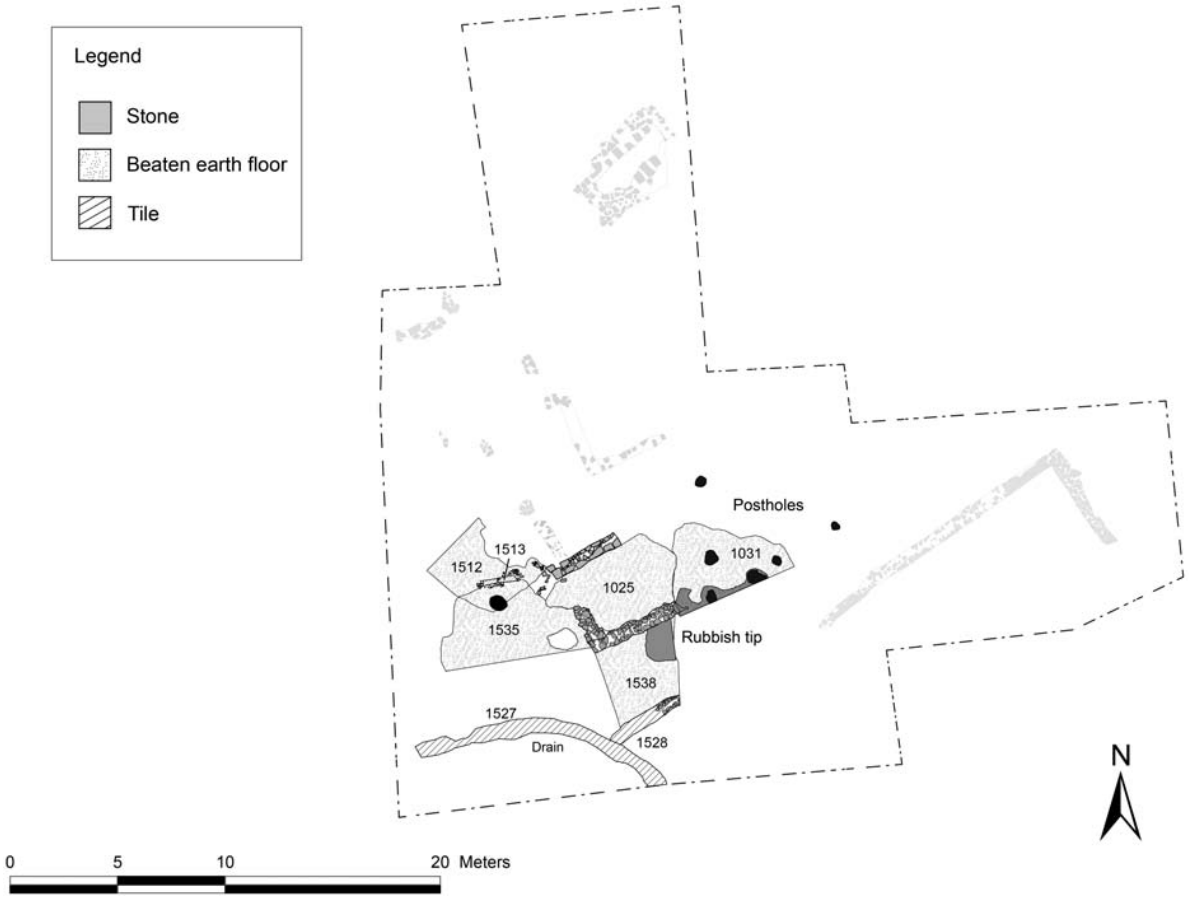


Fig. 4.9 Pievina, plan, Phase 2.1 (ERZ/MS).

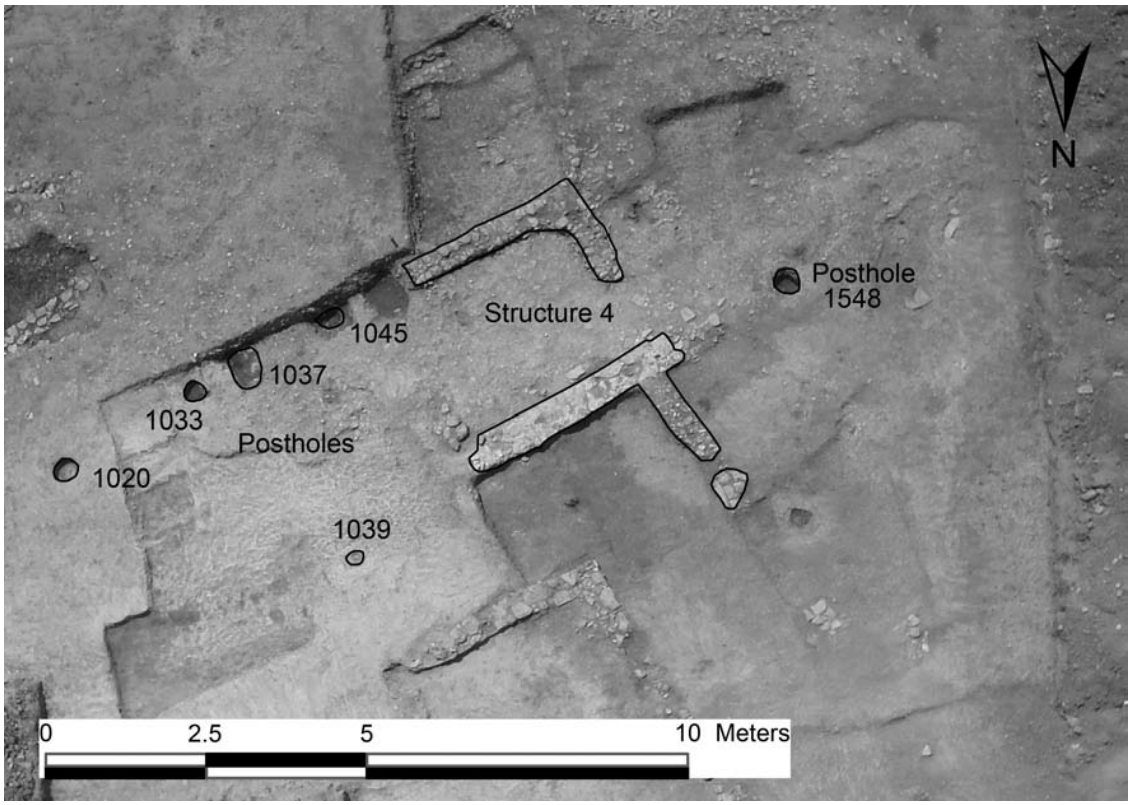


Fig. 4.10 Pievina, aerial view of Structure 4 (PN).

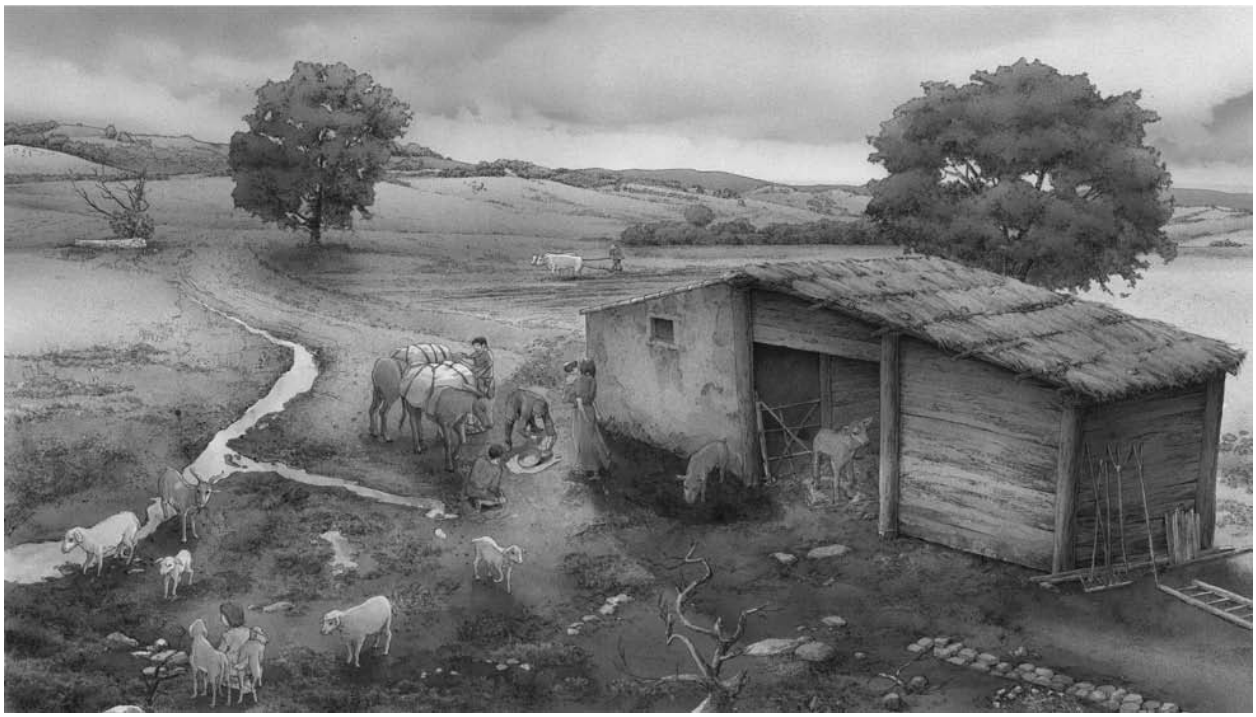


Fig. 4.11 Pievina, reconstruction of Phase 2.1 (Studio InkLink) (See also color insert.)

Fig. 4.12 Pievina, view from E of drain near Structure 4.

Fig. 4.13 Pievina, view into drain from E.

and property boundaries. The Pievina drains seem to have channeled water from the eastern water-prone sections of the site towards the W where the *fontone* at the hill's base suggests that groundwater naturally pooled (see Fig. 4.1).

Between Structure 4 and the drains, the same beaten earth surface that constituted the floor of the house (SU 1025) continued. This seems to have been laid simultaneously with the house floor and served as the paving for a yard. On top of this floor layers of rubbish accumulated, rich in faunal and other organic remains as well as pottery.

To the W of Structure 4, a succession of beaten earth surfaces was laid out, very similar to the floor of the house. Into the last of these was set yet another drain (SU 1513), composed of reused *imbrices*. Framed by a rough semicircle at its upper, E end, the drain may have acted as a gutter, drawing away runoff from Structure 4's roof, which we hypothesize was pitched in this direction.

A well-preserved abandonment level was found in Structure 4. Found beneath a tile roof collapse (SU 1019), this level (SU 1026) was thin, suggesting a short period between the abandonment of this structure and the subsequent phases. An almost complete large bowl in Color-coated ware imitating ARS Hayes 61 was found crushed by the collapse, and the relatively high ratio of diagnostic fragments to MNI (3.6:1) suggested a sealed primary deposit.

Phase 2.2: New surfaces and dumps over Structure 4

Above abandoned Structure 4, new occupation took place, consisting of another beaten earth surface (Fig. 4.14). Above the roof collapse, the ground was leveled up with a thick layer (SU 1018), rich in faunal material, ceramic, and tiles. It contained significant quantities (some 18.4% MNI) of residual ceramics, an anachronistic faunal profile (see below), and a 1st–2nd c. AD *as* (SF 201004), as well as two 5th c. AE4 (SF 201016, 201033). This leveling-up layer was capped by another beaten earth and ceramic surface (SU 1008).

Into this surface (SU 1008), a large (1.5 m diameter) hole was later cut (SU 1006), containing a dump of organic-rich material, as well as ceramic and faunal materials. The ceramic assemblage was abraded and contained a low sherd count per MNI (1.37:1), while the faunal material had a higher percentage of carnivore-gnawed bones, suggesting the secondary deposit of materials originally dumped

Fig. 4.14 Pievina, plan, Phase 2.2 (ERZ/MS).

elsewhere. The cut might represent an original cesspit, later filled with redeposited rubbish coming from different parts of the site (cf. Peña 2007:308).

4.4 Chronology (EV)

Phase 1: The chronology (Table 4.1) of Structures 1–3 is provided by ^{14}C dating, coins and ceramics and indicates a general date of the 2nd through 1st c. BC.

Radiocarbon dating of charcoal from the posthole (SU 1557) in Structure 2 (granary) suggest a general 1st c. BC date (Sample 1: 2065±45 BP, $\delta^{13}C$ (‰) –19.8±0.2; Sample 2: 2046±45 BP, $\delta^{13}C$ (‰) –21.8±0.2).[3] Similarly, trenches in the S end of this same structure revealed a usage or floor-leveling layer containing Black glazed ware of general 2nd to late 1st c. BC date. The ceramics from the hearth (SU 1530) and surrounding levels produced similar materials.

A *terminus ante quem* for the kiln, provided by its abandonment dump, was somewhat more precise centering on the second half of the 1st c. BC. The assemblage included Black glazed ware (carinated bowls, cf. Morel Série 2654a1: 2nd c. BC to the third quarter of the 1st c. BC), one Dressel 1C amphora (late 2nd c. BC to the second quarter of the 1st c. BC), and an Italic sigillata flask and cup (Augustan to the first half of the 1st c. AD).

The abandonment of the Phase 1 site is given by ceramics from the colluvium (SU 1004) and indicate a date not before the first half of the 1st c. AD. The assemblage included fragments of four Italic sigillata bowls, burned cooking pots, close-mouthed jugs, and

other domestic ceramics, but no Black glazed wares. The somewhat later ceramics in this colluvium and residual ceramics datable through to the end of the 1st c. AD found in late antique leveling-up contexts suggest that unexcavated portions of the site may have persisted somewhat longer. The abandonment of Structure 4, SU 1018, for instance, contained Italic sigillata Conspectus 20, 21, and 28, Van der Werff 3, a Spello amphora variant, a possible Dressel 7 and Dressel 2/4.

The site produced virtually no 2nd–3rd c. AD ceramics. A number of 2nd–3rd c. coins came from late antique contexts (see below), but it is not clear if these are the result of re-deposition of 2nd and 3rd c. contexts from the site, or the continued circulation of these coins in late antiquity. Thus, from the early to mid-2nd to the early 5th c., the site seemingly was abandoned. Some evidence for an early 4th c. occupation is provided by three radiate AE4 of late 3rd to early 4th c. date (SF 201007, 201008, 201009), showing little wear, high weight, and likely taken out of use prior to ad 330 AD when a widely applied bronze devaluation tended to remove the earlier higher value issues from circulation.

Phase 2.1: The *terminus ante quem* for Structure 4 is well-dated by its abandonment level (SU 1026) and roof collapse (SU 1019) to the early 5th c. AD. A fragment of Hayes 67B and Color-coated ware imitation of Hayes 61 from the abandonment levels and fragments of Hayes 67B; 61B2; 50B from the roof collapse date to the late 4th–early 5th c. AD. The coins suggest a more precise dating in the middle years of the 5th c. AD: One of the postholes (SU 1039) produced a 5th c. AE4 (SF 201025); the collapse (SU 1029) produced a bronze of Arcadius (395–408) or Valentinian II (375–392), while AE4 of general 5th c.

Table 4.1 Pievina major excavated contexts with diagnostic ceramics/dates (EV).

Context	Chronological Information: Pottery	Total MNI	Possible date	Reliability
Phase 1				
2003	Regional Dressel 1 (1 MNI); Campanian Dressel 1 (1 MNI); BGW documented with 3 MNI, only one of which is assignable to Morel 2654; Italic sigillata: Conspectus K 12 *similis* (1 MNI), Conspectus 1 (1 MNI)	30	Second half/late 1st c. BC	Good/medium: dump
1004	Materials are highly fragmented and despite the presence of at least 4 MNI of Italic sigillata, only one Conspectus 21.3 was clearly identified. Three MNI of the Spello amphora type or its variants are documented too; this type was introduced in the Tiberian-Claudian period	22	First half of the 1st c. AD or slightly later (?)	Medium: abandonment and alluvium
Phase 2.1				
1026	ARS: Hayes 67B (1 MNI); Mediterranean amphorae: Keay 26 (1 MNI); Keay 25/26 (1 MNI)	17	Later 4th to mid 5th c. AD	Good: Abandonment
1019	ARS: Hayes 67B (1 MNI), Hayes 61B2 (1 MNI), Hayes 50B (2 MNI); Mediterranean amphorae: Keay 26 (1 MNI), Africana I (1 MNI)	57	Mid 5th c. AD	Medium: Roof collapse of Structure 4
1018	ARS: Hayes 50B, n.61 *similis*/61B2 (1 MNI), Hayes 67B (2 MNI), Hayes 61A/B2 (1 MNI), Generic Hayes 91A or B (1 MNI); Mediterranean amphorae: Cilician LR1 (1 MNI)	65	Mid 5th c. AD	Medium: Leveling layers above collapse of Structure 4
Phase 2.2				
1006	ARS: Hayes 67C (3 MNI), Hayes 61A/B4 (1 MNI), Hayes 50B (1 MNI), Hayes 52 (1 MNI); Mediterranean amphorae: Almagro 51A/B (1 MNI), Almagro 51 C (1 MNI)	69	Second half of the 5th c. AD	Good: Fill of rubbish pit

date appeared in the rubbish levels outside the house (SU 1037), the abandonment levels in the house (SU 1022) and over the drains (SU 1507, 1023).

Phase 2.2: While the imported ceramics of the rubbish tip (SU 1006) share the same 5th c. chronology as those of the house occupation/abandonment, the appearance of Hayes 67C, dated to the 470s, plus the appearance of a single AE4 of post-mid-5th c. date embedded in the beaten earth surface, suggest a date later in the century.

4.5 Ceramics (EV)

For the late Republican assemblages (Tables 4.2 and 4.3), analysis was focused *only* on particular high-count and functionally specific contexts, namely SU 2003, the dump associated with the late Republican/early imperial kiln. The other late Republican contexts (SU 1004) and residual materials from late antique contexts were not included in this analysis. The late antique materials were examined in their entirety, although SU 1006, the Phase 2.2 dump, was singled out for particular comparative study. Given the relatively larger size of the late antique assemblage, data from other late antique sites in the region, particularly Roselle, are included to emphasize the site's strong integration with urban/coastal markets (Vaccaro 2011).

Phase 1: With only 30 MNI from the dump over the kiln site, the Republican assemblages were much smaller than their late antique successors (Fig. 4.15). With eight classes and ten distinct forms, these assemblages were only modestly diverse. They were typical of sites in the project in being dominated by coarse and kitchen ware classes (13.33 and 46.66% respectively) but were unusual in the high ratio of kitchen ware versus tableware forms (50% to 43%, respectively). This may have been because of the particular nature of the kiln, which may have produced coarse ware in addition to tiles.

Fine wares are dominated by Black glazed wares (10%), with a lesser percentage of Italic sigillata (6.66%), in keeping with the chronology which falls more or less at the transition towards the latter. Bowls, both in Black glazed ware (Morel Série 2654a1) (Fig. 4.16.1) and Italic sigillata (Conspectus 21.3) dominate these collections, as well as cups and flask/bottles (Conspectus 1 and Conspectus K12 *similis*) (Fig. 4.16.2–3). Other common tablewares were coarse ware jugs, bottles, and flasks—the kind of closed, liquid-bearing vessels that are common on all project sites of this period. Experimental sigillata from the site was analyzed by thin section and found *not* to derive from the production facility at Marzuolo (see Ch. 10), but from the southernmost part of coastal Tuscany or Lazio/Campania (1 MNI), from a generic Tuscan origin (1 MNI), and possibly from the Livorno area (1 MNI). However, one of the true Italic sigillata wares from the surface survey did prove a match with Marzuolo fabrics, indicating that some of the fine wares produced locally found their way to Pievina (see Ch. 10).

The sizable coarse ware assemblages includes, as noted, a particularly large proportion of kitchen wares, particularly cooking pots (23.33%) (Fig. 4.16.8) and lids (16.66%). Open forms, consisting of 2 MNI of *tegami* or frying pans in *vernice rossa interna* (Fig. 4.16.9), constitute a distinct minority.

Amphorae include both a fragment of a Campanian Dressel 1C, a regional Dressel variant and 3 MNI of a Spello variant (Fig. 4.16.10–11). This latter's handles and fabrics are not much different than those of the late Roman types at Pievina, which we assigned to a local/regional production (see below). Thus, these too may be local or regional and evidence a long-lasting production tradition.

Typically for our late Republican/early imperial sites in the project, tableware forms demonstrate a slight dominance of open forms, predominantly in fine ware bowls (16.66%), and cups (10%). Closed, coarse ware forms are somewhat less common, consisting of jugs (10%), bottles and flasks (3.33% each).

Phases 2 and 2.2: The analyzed late antique assemblages (Fig. 4.17) included *all* the major late antique contexts, including the Phase 1.1 abandonment (SU 1026) and collapse (SU 1019) of Structure 4, and the Phase 2.1 dump (SU 1006), which covered them. The combination of the two assemblages produced one of the largest samples in the project (232 MNI). In part a product of this is the remarkable formal diversity of these assemblages: while only eight classes and ten different forms were present in the late Republican/early imperial dump (SU 2003), nine classes and 22 distinct forms were found in the late antique contexts.

In its 5th c. reoccupation, coarse and kitchen ware classes continue to predominate (32.32% and 25.45% respectively) but the quantities of fine ware

Table 4.2 Pievina ceramic classes, all phases, by MNI and %MNI diagnostics (EV).

Ware	Pievina Phase 1 (SU 2003 ONLY) (159 diagnotics/30 MNI)	Pievina Phases 2.1 and 2.2 (310 diagnostics/232 MNI)
BGW	3 or 10%	0 or 0%
Italic sigillata	2 or 6.66%	5 (2.15% residual)
Thin walls	3 or 10%	0 or 0%
Experimental sigillata	0 or 0%	0 or 0%
ARS	0 or 0%	16 or 6.89%
Color-coated ware	1 or 3.33%	45 or 19.39%
SCT (*sigillata chiara tarda dell'Italia centro-settentrionale*)	0 or 0%	0 or 0%
Late Italic sigillata	0 or 0%	0 or 0%
Coarse ware	4 or 13.33%	75 or 32.32%
Kitchen ware	14 or 46.66%	59 or 25.43%
Tunisian kitchen ware	0 or 0%	1 or 0.43%
Amphorae	2 or 6.66%	28 (4 of which are residuals) or 12.06%
Coarse ware/amphorae	0 or 0%	0 or 0%
VRI *(vernice rossa interna)*	1 or 3.33%	0 or 0%
Dolia	0 or 0%	1 or 0.43%
Lamps	0 or 0%	2 or 0.86%
Loomweights	0 or 0%	0 or 0%
Amphora stopper	0 or 0%	0 or 0%
Other ware (*tubuli*? and kiln spacers)	0 or 0%	0 or 0%
Thin walls/coarse ware	0 or 0%	0 or 0%
Color-coated ware/coarse ware	0 or 0%	0 or 0%

classes increase in comparison with the late Republican phases, including African red slip (6.89%) (Fig. 4.17.1–6) and Color-coated wares (19.39%), the later often in imitation of the former. In keeping with this trend, dominant forms shift towards a predominance of dining (58.61%) over kitchen and cooking wares (25.86%).

As Table 4.1 indicates, there may have been a significant change in the African red slip supply between Phases 2.1 and 2.2, when the variant Hayes 67C (Fig. 4.17.6). was introduced (3 MNI in SU 1006). This variant, recently dated by Bonifay (2004) to the mid-second half of the 5th c., parallels the stratigraphically later date of SU 1006. Not only does this provide tighter dating distinction between Phase 2.1 (late 4th to mid 5th) and Phase 2.2 (mid-later 5th), but it also strongly suggests that the newest African fine ware forms are reaching Pievina.

More common than African red slip at Pievina are the color-coated and *acroma depurata* imitations of these wares (19.39%) (Fig. 4.17.13–16). The distinction between Color-coated and *acroma depurata* wares was based upon the presence/absence of a very thin red slip, although a more detailed observation of the specimens has revealed that fabrics are generally similar, as in both classes they are soapy and porous, levigated and characterized by the presence of rare golden mica inclusions and very rare limestone. The similarity of the fabric alongside with the very low quality of the slip, which, in general, is very badly preserved and tends to flake off easily, makes the distinction between the two classes somewhat

Table 4.3 Pievina ceramic form/functions, all phases, by MNI and % of MNI diagnostics (EV).

FORMS	Pievina Phase 1 (SU 2003 ONLY) (159 diagnostics/30 MNI)	Pievina Phase 2.1 and 2.2 (310 diagnostics/232 MNI)
KITCHEN (includes KW and VRI)	**15 or 50%**	**60 or 25.86%**
Generic closed forms for kitchen	0	2 or 0.86%
Cooking pots	7 or 23.33%	31 or 13.36%
Cooking jugs	1 or 3.33%	1 or 0.43%
Generic open forms for kitchen	0	0
Casseroles	0	3 or 1.29%
Cooking bowls	0	1 or 0.43%
Frying pans/*tegami*	2 or 6.66%	1 or 0.43%
Bread-baking pans/*testi*	0	6 or 2.5%
Clibani	0	0
Cooking lids	5 or 16.66%	15 or 6.46%
DINING/STORING (includes CW, FW, and CCW)	**13 or 43.33%**	**136 or 58.61%**
Generic closed forms for table and storage	0	21 or 9.05%
Jugs	3 or 10%	20 or 8.62%
Jars	0	2 or 0.86%
Jugs/jars	0	0
Beakers	0	0
Small table pot	0	1 or 0.43%
Bottles	1 or 3.33%	0
Flasks	1 or 3.33%	0
Chalice	0	0
Flanged-Bowls	0	6 or 2.5%
Generic opens forms for table	0	0
Bowls	5 or 16.66%%	14 or 6.03%
Cups	3 or 10%	0
Dishes	0	27 or 11.63%
Bowls/Dishes	0	21 or 9.05%
Basins	0	18 or 7.75%
Lids	0	5 or 2.15%
Small vessels for sauces or perfumes(?)	0	0
Uncertain (food processing?)	0	0
Mortaria	0	0
TRANSPORT and STORAGE	**2 or 6.66%**	**26 or 11.2%**
Amphora stoppers	0	0
Amphorae	2 or 6.66%	24 or 10.34%
Dolia	0	1 or 0.43%
Table amph/jar	0	1 or 0.43%

Table 4.3 cont'd Pievina ceramic form/functions, all phases, by MNI and % of MNI diagnostics (EV).

FORMS	Pievina Phase 1 (SU 2003 ONLY) (159 diagnostics/30 MNI)	Pievina Phase 2.1 and 2.2 (310 diagnostics/232 MNI)
LIGHTING	**0**	**2 of 0.86%**
Lamps	0	2 or 0.86%
OTHER "FUNCTIONAL" CERAMICS	**0**	**0**
Loomweights	0	0
Drains	0	0
Unguentaria	0	0
Kiln spacers	0	0
Molds	0	0
Tubuli	0	0
RESIDUALS	**0**	**9 or 3.87%**
UNCERTAIN	**0**	**0**

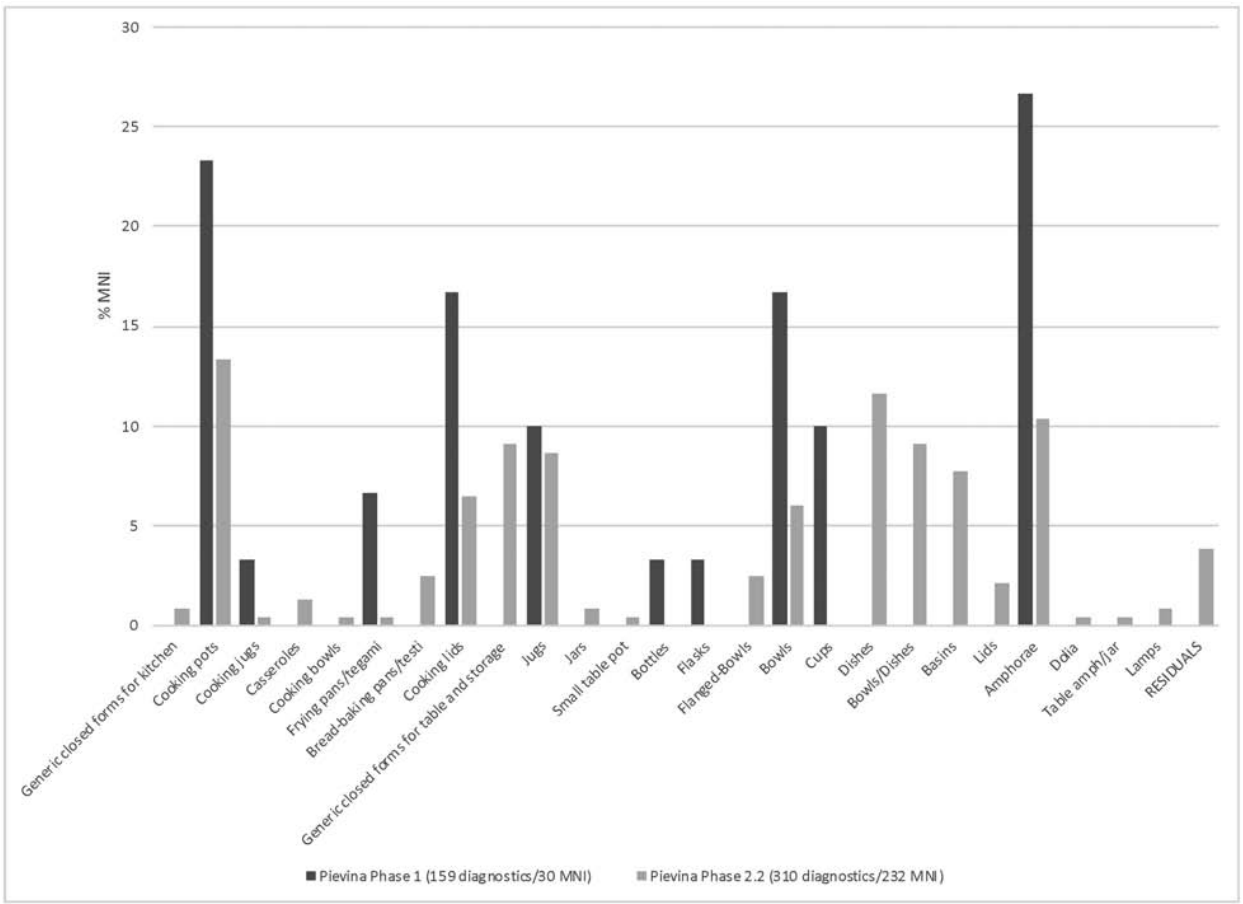


Fig. 4.15 Pievina, comparative presence of functional classes of vessels from 2003 and 1006 (EV).

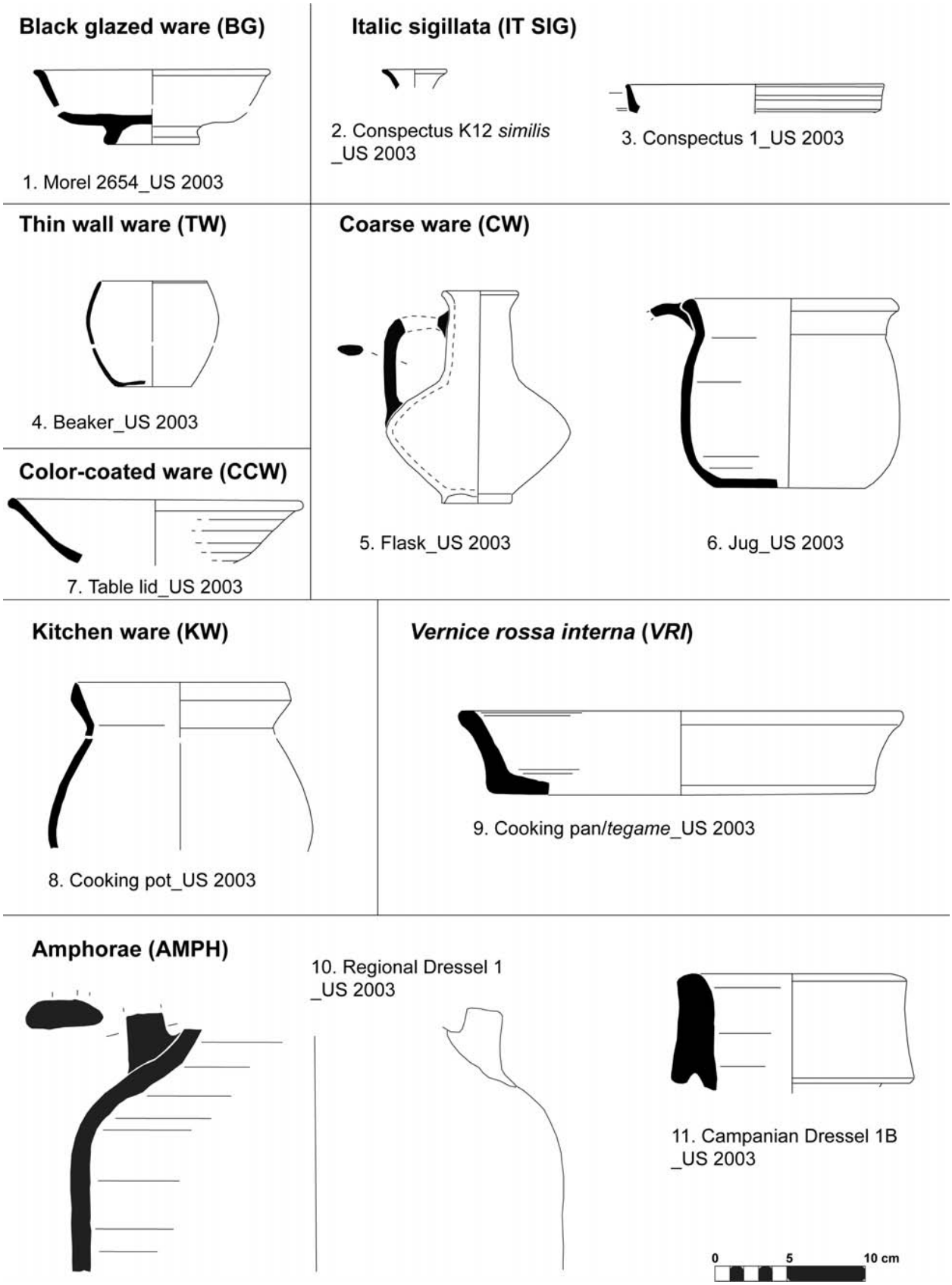


Fig. 4.16 Pievina, representative diagnostic ceramics from US 2003: Black glazed ware (BGW): 1. Dish Morel 2654. Italic sigillata (IT SIG): 2. Small jug/bottle Conspectus K12 *similis*; 3. Dish Conspectus 1. Thin wall ware (TW): 4. Beaker. Coarse ware (CW): 5. Flask; 6. Table-jug. Color-coated ware (CCW): 7. Table lid. 8. Kitchen ware (KW): 9. Cooking pot. *Vernice rossa interna* (VRI): 10. Cooking pan/*tegame*. Amphorae (AMPH): 11. Regional (Ager Cosanus?) Dressel 1; 12. Campanian Dressel 1B (EV).

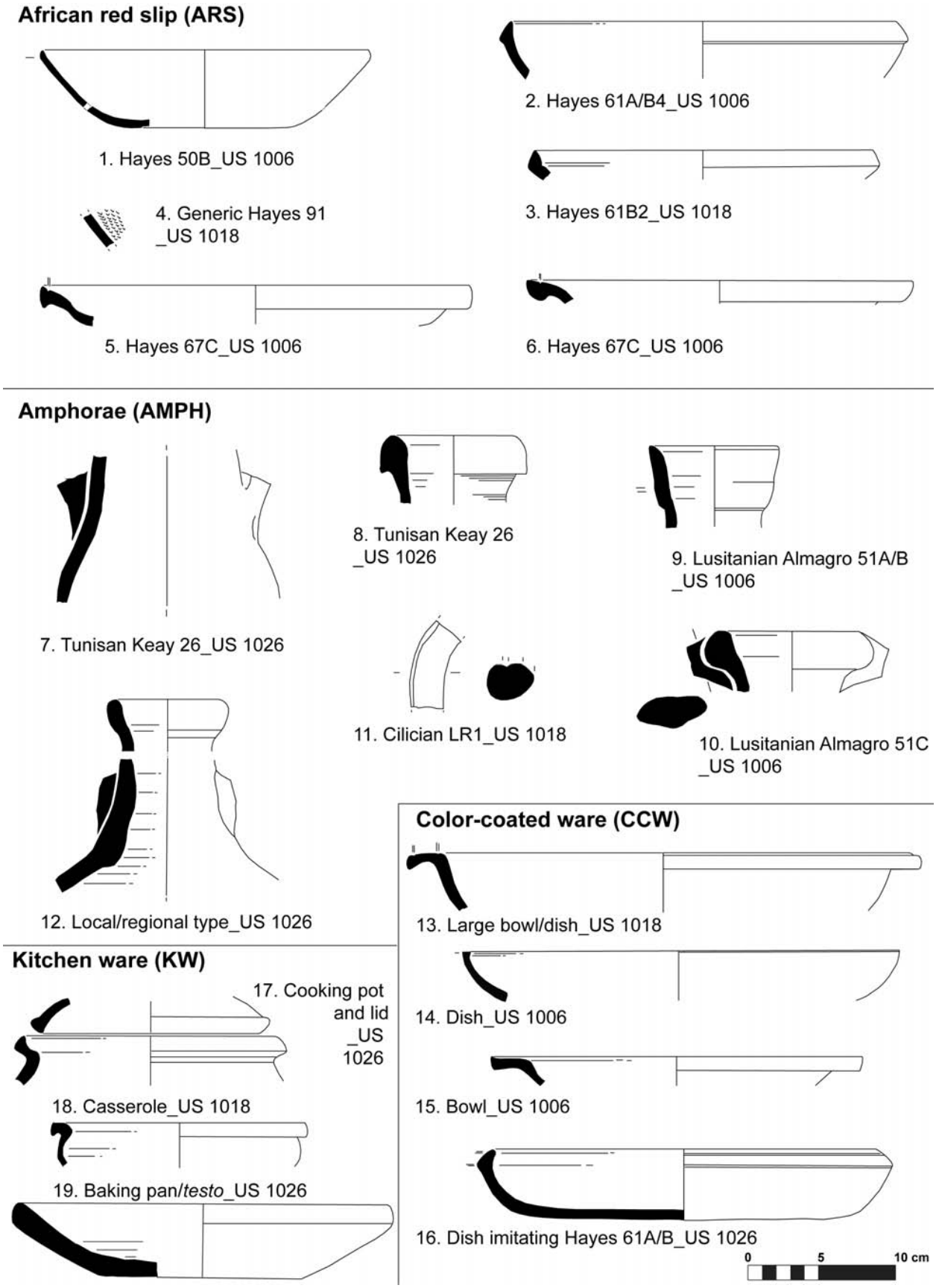


Fig. 4.17 Pievina, representative diagnostic ceramics from late antique contexts: African red slip (ARS): 1. Flat-based dish Hayes 50B; 2. Flat-based dish Hayes 61A/B4; 3. Flat-based dish Hayes 61B2; 4. Flanged bowl 5–6. Large bowls Hayes 67C. Amphorae (AMPH): 7–8. Tunisian *spatheia* Keay 26; 9. Lusitanian Almagro 51A/B; 10. Lusitanian Almagro 51C; 11. Cilician LR1; 12. Local/regional type. Color-coated ware (CCW): 13. Large bowl/dish; 14. Flat-based dish; 15. Bowl; 16. Flat-based dish imitating ARS Hayes 61A/B. Kitchen ware (KW): 17. Cooking pot and lid; 18. Casserole; 19. Baking-pan/*testo* (EV).

arbitrary as we cannot exclude that specimens apparently uncoated had originally a thin red slip which peeled away because of post-depositional processes. As observed in late antique contexts of Roselle (Vaccaro 2014), where the level of preservation of slips is better and distinction between coated and uncoated wares easier, the similarity of fabrics and morphologies in the repertoire of Color-coated and *acroma depurata* wares would be evidence of their production in the same workshops.

An example of this overlap between Color-coated, *acroma depurata*, and African red slip is the many different kinds of bowls (6.03%), bowl/dishes (9.05%), dishes (11.63%), and other open forms that dominate the tableware assemblage here and other RPP sites in late antiquity—a trend quite distinct from the near balance between open and closed forms in the late Republic (see Ch. 14). A large dish with inverted rim imitating the African red slip Hayes 61 that was manufactured in both *acroma depurata* and Color-coated wares (Fig.4.17.16) was common throughout the late antique contexts. A shallow bowl with an everted and almost indistinct rim, characterized by multiple parallel grooves on the outer surface was also available in Color-coated and *acroma depurata* wares in different sizes, as was a shallow dish characterized by a very thin rim, or deeper large bowls and carinated basins. Similar forms are documented in the urban site of Fiesole in phases dating to the second half of 4th–early 5th c. AD (De Marinis 1990:367, pl. 22, n.6; 369, pl. 24, n.18) and at Roselle (Vaccaro 2011; Vaccaro 2014).

Closed forms tableware forms, such as jugs (8.62%), table jars (0.86%), and other generic closed forms (9.05%), are considerably less common than open form wares, a trend common to the late antique sites in the project (see Ch. 14). These closed forms at Pievina are also produced in Color-coated and *acroma depurata* wares, clear evidence for the fact that workshops specialized in their production were able to put a complete repertoire of table and storage wares on the market.

Amphorae were dominated by a newly discovered local or regional type for wine (Pecci et al. 2015; Vaccaro 2015) (Fig. 4.17.12). With a pink-orange fabric characterized by more and less abundant limestone inclusions and mica flecks, which generally recalls fabrics of Color-coated and *acroma depurata* wares, this class comprises some 12 MNI. Their very fragmentary state does not allow us to reconstruct their precise typologies, but there seem to be at least two different modules, which can be distinguished through the neck width. Common to all, however, is the presence of quite thick strap handles with longitudinal shallow grooves along the upper surface, while the bases are hollow and slightly concave in their profile. In one case, fragments of a rim, neck, handle, and base were found in association in the same context, and although fragmentary, their fabrics suggest they were part of the same vessel. The rim is slightly everted and rounded, the neck has the shape of a truncated cone, and the thick strap handle is attached at the shoulder. The spike has the typical slightly concave profile. This amphora type elaborates some morphological elements typical of the early to mid-imperial Spello type (grooved handles) and the late Roman Empoli type (the shape of the spike); nevertheless it can be assigned to a new, previously unknown, regional (in light of its fabric) wine amphora. The discovery of these previously unidentified amphora in inland southern Tuscany is further evidence for the expansion of 5th c. AD regional wine production, previously documented only through the expansion of the Empoli type and Tiber Valley production (Pecci et al. 2015).

Quantities of Mediterranean amphorae, on the other hand, are very low and are represented by 2 MNI of a type of 5th century spathion Keay 26 (Keay 1984), two Portuguese fish sauce amphorae (Almagro 51A/B and Almagro 51C) whose production continued well into the 5th c. AD, and a handle-fragment referable to a Cilician LR1 amphora (Fig. 4.17.7–10). Interestingly, in the 4th to early 5th c. assemblages of the North Hill of Roselle type Almagro 51C is also the most documented imported amphora with 5 MNI out of a total number of 20 (Vaccaro 2011).

The cooking wares continue a preference for closed-form pots (13.86%), with a slight admixture of open formed casseroles (1.29%) and *tegami* (0.43%) (Fig. 4.17.17–19). Unlike the clear linkages between fabrics and slips that indicate a relatively homogeneous workshop practice in tablewares, the large variation in kitchen pots bespeaks less such organization. Despite their heterogeneity, however, kitchen wares at Pievina find many comparisons in other ceramic assemblages of southern Tuscany, including Roselle, Scoglietto, and Fiesole (De Marinis 1990:232 and 391, pl. 46, nn. 34–35; Vaccaro 2011).

Paul Arthur (2007:15–27) recently suggested that cooking pots declined in late antique/early medieval Mediterranean contexts in favor of casseroles, due to a dietary preference for sheep/goat meat, which was cooked through evaporative cooking in open formed vessels. At Pievina, and throughout our sites, the long-term predominance of cooking pots over casseroles speaks against this, possibly because the meat of older, tougher work-animals of all species, and cattle particularly, is better cooked through water-based stewing (see below) or because of a continued emphasis on boiled grains: puls, barley, etc. (see also Ch. 14).

Perhaps the most remarkable aspect of the late antique ceramic assemblages is the relatively high number of distinct ceramic forms. Looking only at functional classes from the Phase 2.2. dump (SU 1006), it was possible to carry out a comparison with a later 4th–5th c. assemblage from a workshop in Roselle (Vaccaro 2011). The Pievina assemblages displayed nearly the same functional diversity as Roselle in this period (Fig. 4.18 and Table 4.4).[4] The only class of ware present at Roselle but absent at Pievina is the regionally produced *sigillata chiara tarda dell'Italia centro-settentrionale* (cf. Fontana 2005), a ware that seemingly clung to the coasts and elite sites, and which tellingly was found at the project site of Case Nuove near the villa of Santa Marta (see Ch. 5). Roselle also boasted a broader range of cooking wares, particularly open forms like casseroles and pans, suggesting more frying and roasting: it may be that cuts of younger animals, and certainly fish, were available at Roselle for which long stewing was not necessary (see below). However, the relative quantities of imports at Pievina and Roselle are more or less the same, with Tunisian imports (including African

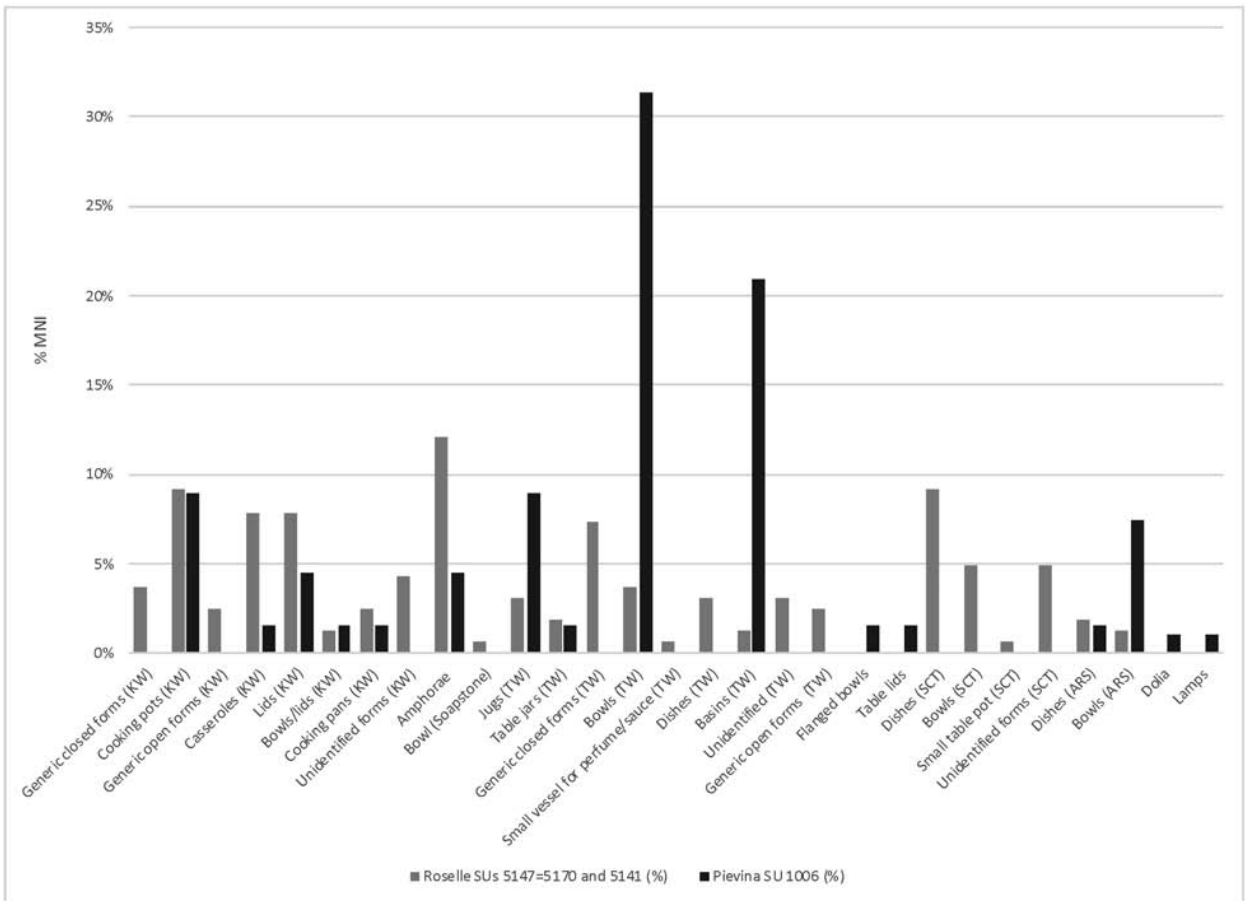


Fig. 4.18 Pievina, comparison between Pievina US 1006 with data from Roselle US 5147=5170 and 5141 (as %MNI). NB: "Generic" and "unknown" classes at Roselle are ignored in the discussion in the text, as these classes were not used at Pievina (EV).

Table 4.4 Pievina ceramic classes from Pievina SU 1006 (mid- to late 5th c.) compared with the data from Roselle SU 5147=5170 and 5141 (late 4th–5th c.) by MNI and % of MNI (EV).

	Roselle SUs 5147=5170 and 5141 (MNI)	Pievina SU 1006 (MNI)	Roselle SUs 5147=5170 and 5141 (%)	Pievina SU 1006 (%)
Generic closed forms (KW)	6	0	3.63%	0%
Cooking pots (KW)	15	6	9.09%	8.95%
Generic open forms (KW)	4	0	2.42%	0%
Casseroles (KW)	13	1	7.87%	1.49%
Lids (KW)	13	3	7.87%	4.47%
Bowls/lids (KW)	2	1	1.21%	1.49%
Cooking pans (KW)	4	1	2.42%	1.49%
Unidentified forms (KW)	7	0	4.24%	0%
Amphorae	20	3	12.12%	4.47%
Bowl (Soapstone)	1	0	0.60%	0%
Jugs (TW)	5	6	3.03%	8.95%
Table jars (TW)	3	1	1.81%	1.49%
Generic closed forms (TW)	12	0	7.27%	0%
Bowls (TW)	6	21	3.63%	31.34%
Small vessel for perfume/sauce (TW)	1	0	0.60%	0%
Dishes (TW)	5	0	3.03%	0%
Basins (TW)	2	14	1.21%	20.89%
Unidentified (TW)	5	0	3.03%	0%
Generic open forms (TW)	4	0	2.42%	0%
Flanged bowls	0	1	0.00%	1.49%
Table lids	0	1	0.00%	1.49%
Dishes (SCT)	15	0	9.09%	0%
Bowls (SCT)	8	0	4.84%	0%
Small table pot (SCT)	1	0	0.60%	0%
Unidentified forms (SCT)	8	0	4.84%	0%
Dishes (ARS)	3	1	1.81%	1.49%
Bowls (ARS)	2	5	1.21%	7.46%
Dolia	0	1	0.00%	1%
Lamps	0	1	0.00%	1%
TOTAL	**165**	**67**	**99.89%**	**100%**

red slip ware, amphorae, and Tunisian kitchen ware related to African red slip ware) comprising only 16.8% at Roselle, a percentage not much higher than that at Pievina. All of the African red slip ware forms at Pievina are found at Roselle, and, in both sites, the largest source of imported, amphora-born foodstuffs appears to have been Portugal with Almagro 51A/B and Almagro 51C appearing at both sites. The tablewares at the two sites show similar diversity in forms. The near-absence of dishes at Pievina, and the greater preponderance of bowls there, may lend further support to the hypothesis of older animals cooked through boiling/stewing at Pievina, versus dry-cooked younger cuts at Roselle, and/or a greater emphasis at Pievina on gruels, porridges, and puls.

4.6 Faunal Materials (MM)

Over 1,000 pieces of bone were recovered from Pievina (Tables 4.5–4.8), one of the largest sample sizes in the project. However, these were distributed in uneven quantities, spatially and temporally: most derive from late antique contexts (92.5%), a notable number of which (7.7% by total count, 15.7% by the number of identified specimens [NISP] count) were collected from the late antique secondary rubbish tip (SU 1006). Overall, the bulk of the remains represents somewhat more peripheral waste, such as trash from floor-cleaning or the haphazard rubbish that might accumulate during episodes of construction, destruction, or abandonment. Most bone specimens collected from the site rank in 'fair' condition (assuming a scale of excellent–good–fair–poor), and the impact of taphonomic factors (such as abrasion, carnivore gnawing, and trampling) appears negligible, suggesting that most faunal materials were deposited and buried over relatively short periods of time.

Mammalian bones preponderate across phases, totaling 97.5% of the entire NISP sample and over 99% of the fragments not identifiable to a precise species. It is uncertain to what degree marked taphonomic destruction impacted on the values for avian bones and obliterated remains of fish, or if their infrequency denotes their very low dietary and economic contribution. The collection at Pievina is dominated (91.5%) by bones of the three principally consumed domesticates: cattle, sheep/goats, and pigs (Table 4.7). Consumable wild animals, including wild boar, red deer, roe deer, and hare, are rare, but more plentiful during the late Republican/early imperial phase.

Regardless of quantifier (NISP and the minimum number of individuals [MNI]), cattle and ovicaprid frequencies increase from Republican/early imperial levels through late antiquity (moving from 13.0% to 22.3%, and from 26.1% to 42.8%, respectively, based on the NISP) (Table 4.7). The increase in these taxa comes at the expense of pigs, which decline in frequency from 60.9% to 34.9% over the same period.

Cattle: Cattle frequencies increase from the late Republic/early empire to late antiquity (13.0% to 22.3% based on the NISP). Age data for cattle record a predominance of adults across both periods, although the presence of some sub-adult cattle bones from late antiquity suggests that in this period some young cattle were culled from a small herd without jeopardizing its vitality. From the frequency of skeletal parts, it would seem that some whole cattle were slaughtered and butchered in the vicinity of the site during late antiquity, with carcass parts then distributed locally for consumption (Table 4.8). There appears to be no (or very little) import or export of beef cuts to or from the area.

Overall, few cattle bones yield results that can help estimate size and shape parameters of living individuals, but the few measurements obtained tend to fall below averages for cattle of a similar timeframe in central Italy (MacKinnon 2004). This may mean several things: a predominance of cows, a substandard local Etrurian/Latium breed of cattle, or a separate breed, possibly the Campanian variety or the smaller of the two Umbrian varieties as described in the ancient texts (Columella, *Rust*. 6.1.1–3), selected possibly for reasons of economy. Overall, the cattle data point to relatively small herds, used principally for traction, and culled on site after their usefulness had ended.

Sheep/goat: A trend to increased sheep/goat frequencies from the late Republic to late antiquity conforms to general patterns for many sites (King 1999:173). The increase at Pievina is not dramatic (26.1% to 42.8%, on the basis of the NISP), and probably does not signify specialization on a grand scale for market driven reasons (Table 4.7). It is unclear how the Pievina sheep/goats were managed, but the predominance of sheep across all periods suggests the keeping of some flocks (as sheep herd more readily

Table 4.5 Pievina faunal remains, NISP, and MNI values by temporal phase (MM).

	Pievina Phase 1			Pievina Phase 2.1 and 2.2		
	NISP	MNI	Weight (g)	NISP	MNI	Weight (g)
Cattle (*Bos taurus*)	3	1 (a)	101	60	3 (1s, 2a)	2132
Sheep/goat (*Ovis aries/ Capra hircus*)	6	1 (a)	42	115	6 (1j, 1s, 4a)	746
Pig (*Sus scrofa* dom.)	14	2 (1s, 1a)	100	94	8 (1j, 4s, 3a)	553
Equid (*Equus* sp.)	—	—	—	4	1 (a)	116
Dog (*Canis familiaris*)	1	1 (a)	20	1	1 (a)	7
Domestic fowl (*Gallus gallus*)	1	1 (a)	1	2	1 (a)	2
Red deer (*Cervus elaphus*)	1	1 (a)	2	2	1 (a)	28
Roe deer (*Capreolus capreolus*)	—	—	—	1	1 (a)	2
Wild boar (*Sus scrofa* fer.)	—	—	—	6	1 (a)	97
Hare (*Lepus europaeus*)	1	1 (a)	1	—	—	—
Badger (*Meles meles*)	—	—	—	2	1 (a)	13
Tortoise (*Testudo* sp.)	—	—	—	5	1	22
TOTAL	**27**		**267**	**292**		**3178**

a = adult; s = subadult; j = juvenile

than goats) and a strong demand for wool. Further, an imbalance of adult to subadult sheep/goats (4:1) in the late antique phases suggests that farmers maintained the bulk of their sheep and goats to maturity in order to exploit them for secondary products (wool, hair, milk) and only secondarily for meat. This may suggest that herders kept animals in the local area around Pievina throughout the year to maximize control over age categories and culling operations, rather than there being any major transhumance movement.

Pigs: High NISP and MNI values for pigs in the late Republican/early imperial period conform well to patterns at neighboring sites (MacKinnon 2004). The decline in the frequency of pigs at Pievina between the late Republic and late antiquity counters the trend for other sites in the region. These other sites are predominantly rural villas that may have capitalized on still somewhat strong urban demands for pork, while the patterns at Pievina accord more with sheep/goat pastoralism and mixed farming operations, as opposed to any marked specialization in late antiquity. Age data record a fairly balanced mix of juvenile, subadult and adult individuals for most periods. This mix implies local production and consumption, and probably maintenance on site, or in the general area, year-round. There are no structural indications at Pievina for pigsties, suggesting they were maintained in a more casual setting, and probably within smaller herds. Pig sex ratios remain fairly balanced across phases, suggesting less control to maximize breeding potential, or to fulfill culinary preferences for suckling and juvenile pigs. Finally, when the bias of mandibular incisors and canines is removed (these counts skew figures for the "head"

Table 4.6 Pievina faunal remains, UNID counts by temporal phase (MM).

	Pievina Phase 1		Pievina Phase 2.1 and 2.2	
	Count	Weight (g)	Count	Weight (g)
MAMMAL				
SMALL				
Rib	—	—	5	3
Other	—	—	1	1
MEDIUM				
Rib	2	11	73	125
Long bone	24	43	383	958
Vertebrae	2	18	14	32
Scapula/Pelvis	1	2	5	7
Cranium	2	2	26	39
Other	—	—	10	25
LARGE				
Rib	10	188	9	117
Long bone	8	135	94	1171
Vertebrae	—	—	11	219
Scapula/Pelvis	—	—	2	15
Cranium	—	—	13	35
Other	—	—	—	—
AVIAN	—	—	2	2
TOTAL	**49**	**399**	**648**	**2749**

Table 4.7 Pievina faunal remains, % NISP, and MNI values by temporal phase for principal domestic meat taxa (MM).

	Pievina Phase 1		Pievina Phase 2.1 and 2.2	
	NISP (n=23)	MNI (n=4)	NISP (n=269)	MNI (n=16)
Cattle (*Bos taurus*)	13	25	22.3	18.8
Sheep/goat (*Ovis aries/Capra hircus*)	26.1	25	42.8	31.3
Pig (*Sus scrofa* dom.)	60.9	50	34.9	50

Table 4.8 Pievina, NISP and MNE frequency of skeletal part categories for cattle, sheep/goat and pig for Phases 2.1 and 2.2 (MM).

	Cattle				Sheep/Goat				Pig			
	1°	2°	ext.	head	1°	2°	ext.	head	1°	2°	ext.	head
NISP	13.3	10	31.7	45	4.3	14.8	13	67.8	13.8	6.3	13.8	66
MNE	37.5	12.5	25	25	15.4	23.1	23.1	38.5	20	13.3	13.3	53.3

Sample sizes by phase (phase=n):
cattle: NISP=60; MNE=8
sheep/goat: NISP=115; MNE=13
pig: NISP=94: MNE=15

1° = primary cut (includes scapula, humerus, pelvis, femur)
2° = secondary cut (includes radius, ulna, tibia, fibula)
ext. = limb extremities (includes metapodials, carpals, tarsals, phalanges)
head = cranium, mandible, all teeth

category), representation across pig skeletal part categories becomes more balanced, and is suggestive of whole animals being slaughtered, processed and consumed locally, with rubbish from all steps discarded in the site vicinity (Table 4.8).

Other species: Domestic fowl bones were relatively infrequent finds at Pievina, ranging between a high of 3.7% of NISP counts in Republican/early imperial contexts, to a low of about 0.7% during late antiquity (Table 4.5). This rather small input might seem odd for a peasant household, many of which today keep some manner of domestic fowl as a fairly easy and economical foodstuff. Still, these statistics parallel average domestic fowl NISP frequencies of 5–10% for Roman Italy generally (MacKinnon 2004:54–56) and neighboring sites more specifically.

Equid bones are also scarce in the Pievina sample (Table 4.5). This is not surprising, considering that horses, donkeys, and mules normally were not consumed in antiquity. The scarcity of equid bones from the Pievina sample may be due also to the expenses involved in maintaining these animals. Equid remains recovered from Pievina are restricted to late antique contexts, and size estimates place these elements within the donkey category, as opposed to horse or mule.

Finally, the contribution of wild animals to the diet and economy at Pievina also appears to have been minimal, regardless of time period. Wild animals register their largest NISP frequencies during the late Republic (7.4%) but drop to a paltry 1% during late antiquity (see Table 4.5). While we are only beginning to reconstruct the vegetation in the study area, it seems likely that the environs of Pievina would have been, as they are today, an ideal habitat for forest animals as well as hare. Why the inhabitants failed to exploit them is unclear, but is broadly representative of trends from most, but not all, project sites (cf. Tombarelle, Ch. 11).

Butchery and cooking patterns: Available butchery data for Pievina conform to the relatively standardized procedures noted at Roman sites in general (MacKinnon 2004:162–84). There is enough variability in terms of cut and chop placement, depth and frequency to discredit the notion that butchery was the exclusive domain of skilled professionals; some level of household, or at least smaller-scale, operations existed. Even at this level, however, butchery procedures were standardized enough to indicate that whomever did the job had at least a rudimentary knowledge of skeletal anatomy. Overall, butchery process and technology did not change significantly over time.

There is no conclusive zooarchaeological evidence to determine methods of meat preservation, storage, and cooking at Pievina. Only a few examples of burnt bones were noted from the entire sample, which is itself possibly significant. While filleted cuts of meat could be roasted and leave no, or few, traces, boiling might have been preferred overall, especially if inhabitants favored soups and broths and wished to extract fat and marrow from the bones. The relatively high and consistent percentages of cooking pots in both periods might support this hypothesis. Finally, a fair number of spirally fractured long bones from cattle, sheep/goats and pigs were noted. This generally is associated with the smashing of fresh bones to extract the marrow within, again suggesting local butchery and consumption.

4.7 Geological Considerations, Land Units, and Evaluation (AA)

According to the geological and landscape data, the site is located near the interface of yellowish fine sandy (loamy) surface layers with a grey clayey soil with surface cracks. When considered in more detail (Fig. 4.19), the site lies at an interface between clayey layers to the SW and NE, and sandy layers in between, with clayey gradually replacing sandy as one moves down the hill. This distribution may have produced a small aquifer in which the water within the coarser layers was forced to the surface by the finer layers. The hypothetical cistern (Structure 1) was built near one of these sand/clay divides.

The construction of the land units map for the site (Color Fig. 4.20), and the following land evaluation (Fig. 4.21) revealed further aspects of its adjacent land suitability and access to nearby resources. The site is located near the intersection where rich and deep soils begin to blend with the steeper and stonier soils towards the Monte Amiata's slopes. Thus positioned, its inhabitants could take advantage of both the potential of all three land units: rich cereal producing and pasture areas to the W, slopes ideal for olive/grapes, and the steeper slopes rich in timber to

the E. Only a single hypothetical land evaluation was generated for this site but, were the Calceri-Vertic Cambisols to the W regarded as less suitable owing to their weight and consequent difficulty in plowing (see Ch. 2), the areas to the W might be downgraded to S2.

Pievina's locale is crossed by three major rivers with a torrential hydrological regime: the Ribusieri, Trisolla, and Melacce (Fig. 4.22). These rivers show an only slightly incised initial tract, followed by a middle tract with a steep valley, and finally a flat, large valley floor, terraces and rather steep bordering slopes. Only the Trisolla lacks a deeply incised tract. The slightly incised valleys would be easy to cross, the steep and deep valleys almost impossible to cross or to follow lengthwise, and the valleys with floors rather easy to cross and to follow lengthwise.

It follows from these considerations that the Ribusieri valley, with its deep incision and almost north–south direction, is a likely obstacle to the E. The Melacce River had a similar effect in the SE, although its central and SW valley was flat enough to provide passage towards the Ombrone. The Trisolla valley is less of an obstacle to the N as it is not incised very deeply. The Ombrone and Orcia valleys, with their braided river pattern, are seasonably fordable but probably not every year. Thus, movement from Pievina to the NW and SW would be relatively easy, directions where the land units suggest suitable cropland and, in the case of the former, many of its nearest neighbor sites were located.

Movement E is more challenging, and land in this direction less suitable for agriculture. The forested slopes of Monte Amiata provide other kinds of resources, and Pievina sits on the only natural route to the E (marked by the modern Cinigiano/Monticello road; Grey et al. 2015). Movement W might

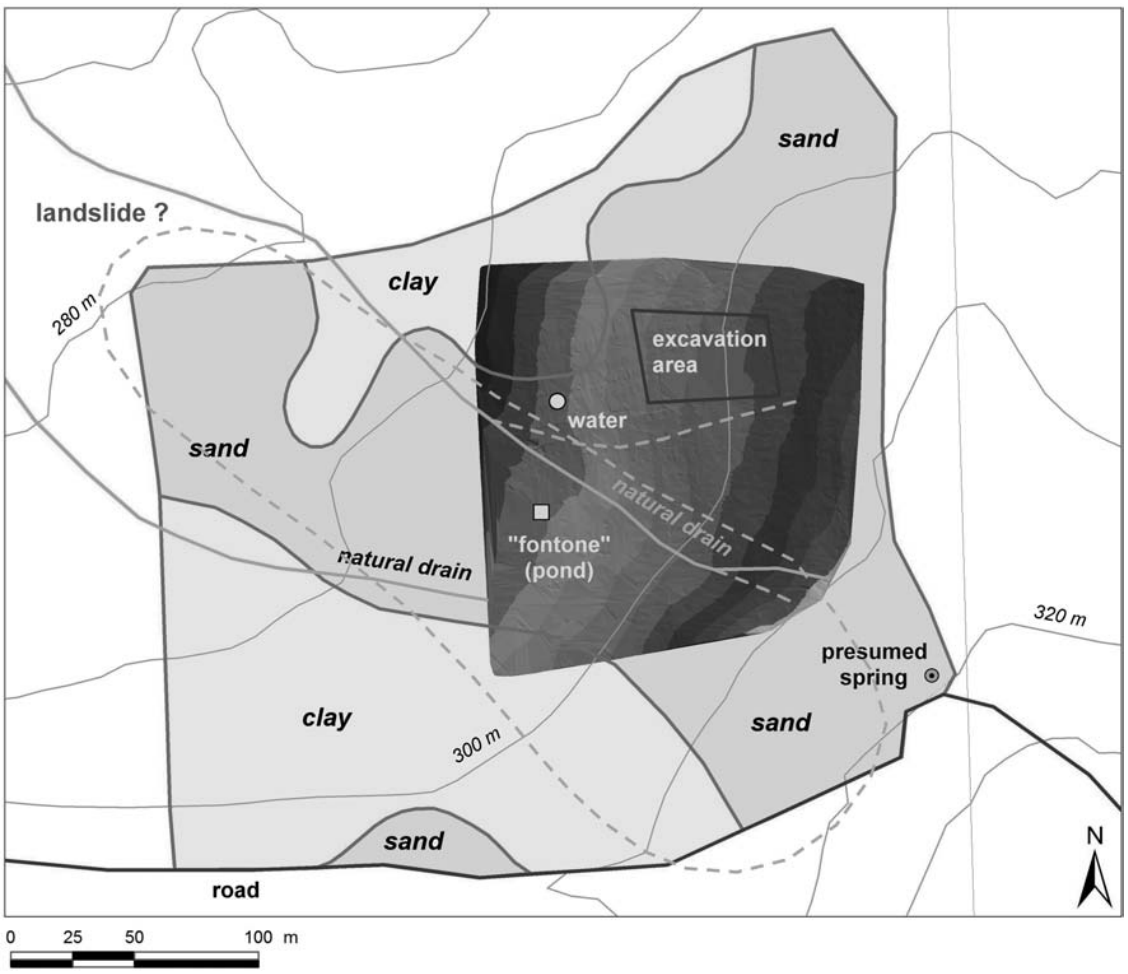


Fig. 4.19 Pievina, sketch of site showing major geological features (AA).

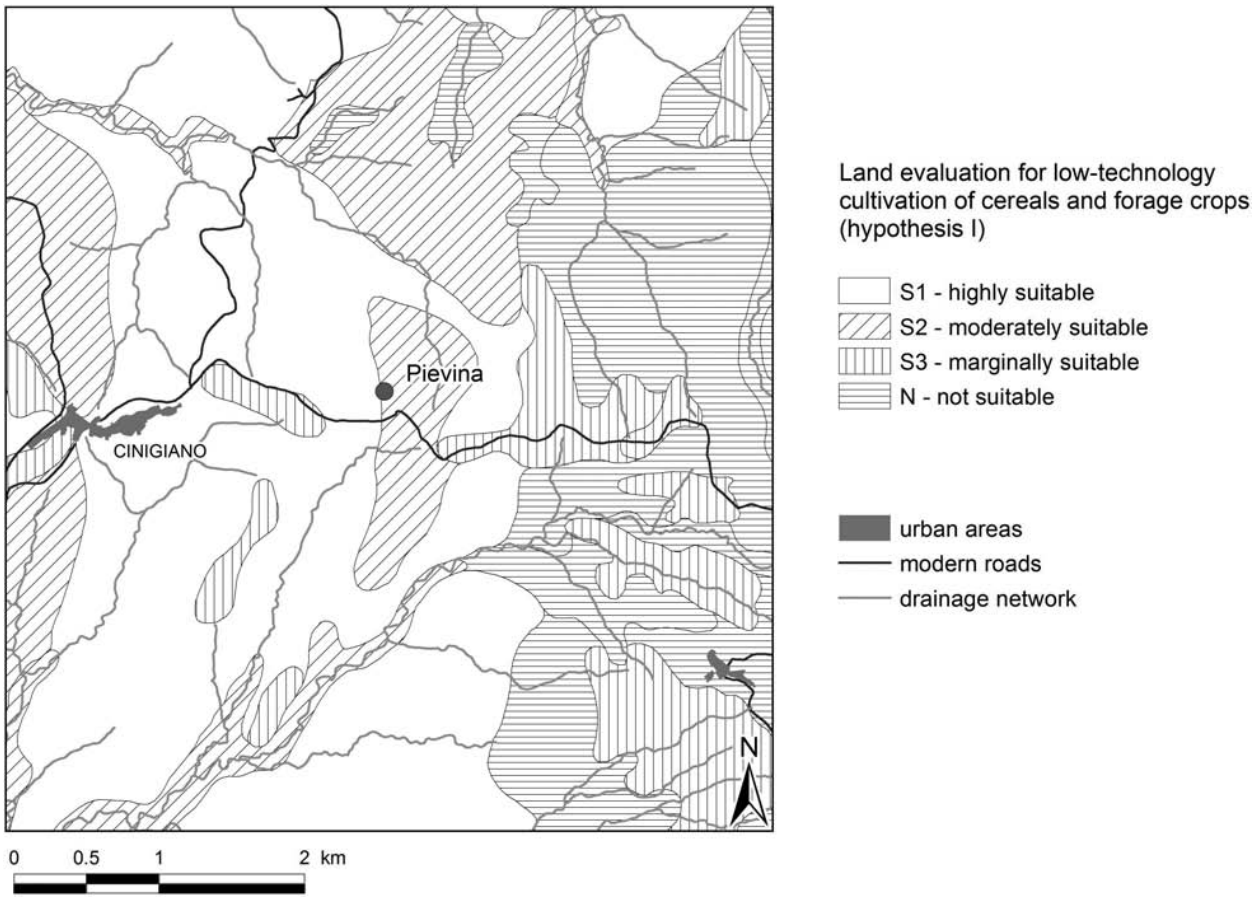


Fig. 4.21 Pievina, land evaluation map, hypothesis I (AA).

be less difficult and more attractive than is obvious from the topography alone, and Pievina's inhabitants might have benefited from either access to or control over E-W movement.

4.8 Botanical Materials

During this first year of the project, when funding was very limited, botanical materials were not sampled.

4.9 Coins (FM)

Pievina produced the largest number of coins in the project, and a similar abundant quantity of small finds. As with the ceramic and faunal materials, these were unequally distributed spatially and chronologically with the majority coming from late antique contexts, particularly abandonment and collapse of Structure 4 and the Phase 2.2 dump (SU 1006).

Thirty-four bronze coins were found in the excavations at Pievina, ranging in date from the Republic to the 5th c. AD, to which can be added a 19th c. coin from the plow soil and two non-classifiable fragments (Table 4.9, Figs. 4.23 and 4.24). The majority of examples were poorly preserved, corroded, and worn. The examples dateable between the end of the 3rd and 5th c. AD were often fragmented, incomplete, and/or missing their edges. These factors have decreased the legibility of the majority of pieces, principally the late antique examples, many of which were thus dated generally on the base of their weight, diameter, on the characteristics of the flan and some traces of the die strike.[5]

The numismatic evidence extends from the 1st c. BC through the 5th c. AD without apparent interruption, seemingly suggesting a continuity of occupation at the site throughout the entire imperial period.

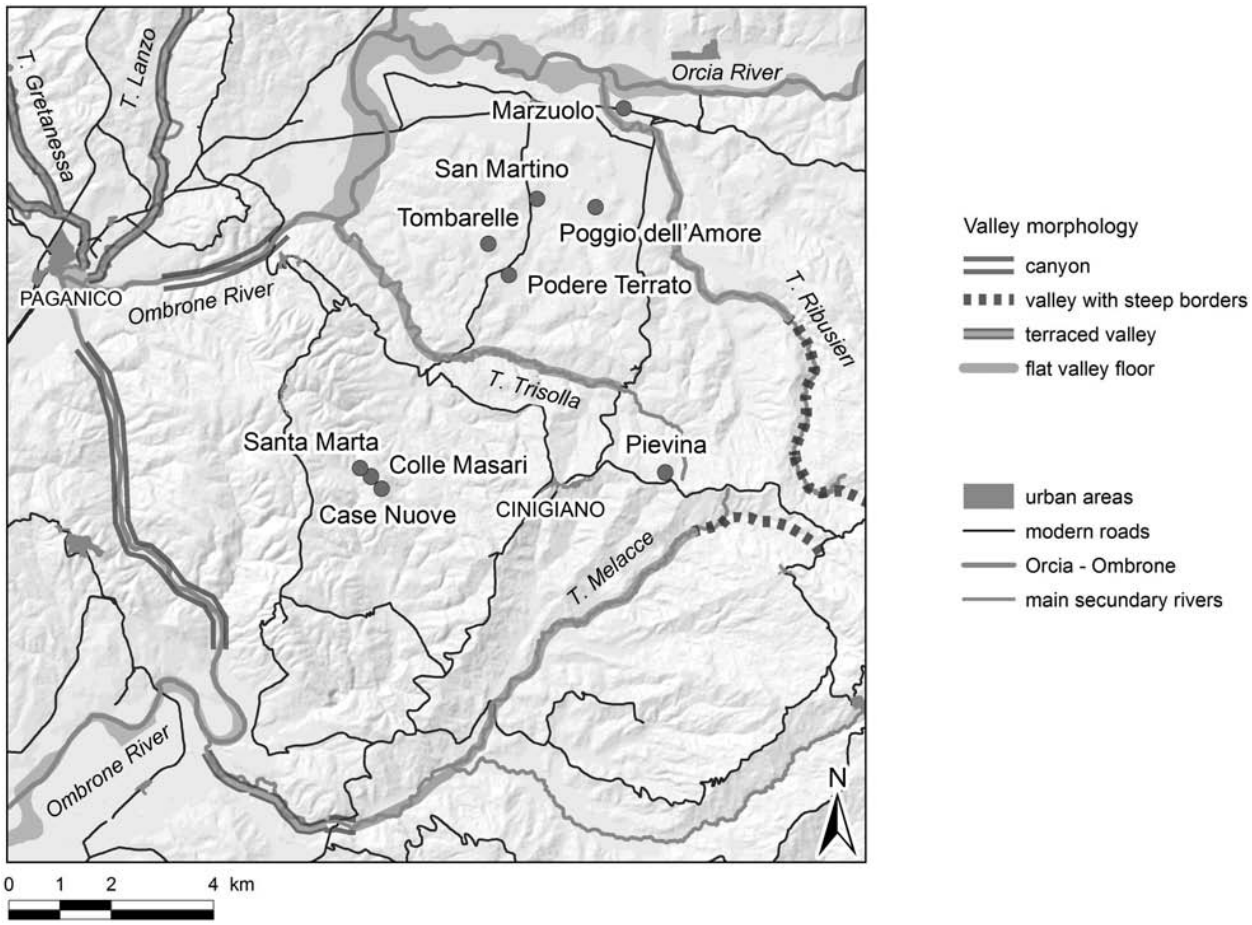


Fig. 4.22 General map of valley morphology (AA).

This impression is not supported by the archaeology which, as described above, revealed only two major phases of occupation—one of the late Republican period and one in late antiquity. Phase 1 levels did not yield any coins, and the Republican-period *as* (perhaps related to the Janus/prow series), a denarius of the same period, and two *asses* of Tiberius and Claudius were found in the plow soil. Two *asses* of Faustina I or II (SF 201002, 201003) thus far do not correspond to any excavated phases, and either represent residual materials in use in late antiquity or derive from phases evident in other, unexcavated parts of the site. It should be noted, however, that coins of the first three centuries of the empire, which tend to be of higher weight and quality, would tend to be less frequently lost, skewing the sample and underrepresenting that period, were it present on the site.

From the end of the 3rd c. AD numismatic evidence increases, culminating in the 5th c. AD. The origins of this spike may lie in the increases of coin in circulation after the reforms of Diocletian and his successors, which put into circulation the *nummus* and its fractions and lead to an overall decline in the weight and quality of bronze coins (Depeyrot 1992:40–49, 52–56; Abdy 2012), producing a concomitant increase in quantity as a result of inflation (Camilli and Sorda 1993). Nonetheless, this relatively large quantity of small value coins in a site of this size is worthy of note.

From the end of the 3rd c. come a probable Antoninianus (SF 201009) in bad state of conservation and two coins of the Tetrarchic period from the *Concordia Militum* e *Vot XX*, series (SF 201007, 201008). These securely dated late 3rd c. to early 4th c. examples deserve some further commentary. The low-value Antoninianus may have remained in circulation for a prolonged period until 5th c. and beyond, as is shown by the various examples from the

Table 4.9 Pievina, coin finds by stratigraphic context, within which organized chronologically (FM).

Phase	Archaeological Context	SU	Authority and Mint	Date	Metal and Denomination	Obverse	Reverse	Weight and Size	Reference	SF
2.1	postholes	1039	Uncertain attribution	first half 5th c.	AE4	illegible	illegible	0.69 g 11.00 mm incomplete		201025
			Uncertain attribution	mid-5th c.	AE4 or minimus	illegible	illegible	0.46 g 9.00 mm incomplete		201029
	outside floor of structure 4	1031	Faustina II, Rome	161–176	AE, as	[FAV]STINA-AVG[VSTA]. Bust r.	illegible	9.17 g 24.40 mm		201003
	abandonment levels in the house	1022	Uncertain attribution	mid-4th c.	AE4	Bust r.	illegible	9.15 g 13.90 mm		201024
		1030	Uncertain attribution	ca. 260–294	MI, antoninianus	Bust radiated r.	illegible	0.89 g 15.10 mm		201009
			Uncertain attribution	335–341	AE, nummus	Bust r.	Two soldier with one standard (*gloria exercitus*)	0.23 g fragment		201036
			Uncertain attribution	353–361	AE3	Bust r.	Falling horseman (*fel temp reparatio*)	0.72 g 13.40 mm incomplete		201019
	abandonment levels over the drain	1023	Uncertain attribution	mid-5th c.	AE4 or minimus	Illegible	Illegible	0.68 g 9.30 mm		201022
		1057	Roman Republic, Rome	beginning of the 1st c. BC (ca. 90–82 BC)	AR, denarius	Laureate head (Apollo?) r., behind, scepter; with control-symbol and control-letter	Trace (quadriga r. or horseman r.)	2.80 g 21.20 mm	cf. RRC, p. 346–347, 342/4–5; RRC, p. 375, 361/1b–c	201001
			Uncertain attribution	mid-5th c.	AE4 or minimus	Illegible	Illegible	0.63 g 9.90 mm		201026
	rubbish level outside the house	1037	Uncertain attribution	4th c.	AE3 or AE4	Illegible	Illegible	0.58 g 14.10 mm incomplete		201023
	roof collapse	1535	Uncertain attribution	353–361	AE3	Bust r.	Falling horseman (*fel temp reparatio*)	1.63 g 16.40 mm		201014
		1512	Roman Republic, Rome	late 3rd (post 211) to mid 2nd c. BC	AE, as	Illegible	Prow (?)	19.68 g 19.90 mm incomplete		201006
		1027	Uncertain attribution	second half 4th c.	AE3	Illegible	Trace (Victory to l.?)	0.83 g 14.00 mm		201017
		1029	Maximian, Rome	297–298	AE, radiate fraction	MAXIMIANVS [NOB C or NOB CAES]. Radiate head	V[OT / XX] in wreath	3.13 g 18.60 mm	RIC VI, p. 360, nn. 88b, 89b	201008
			Constantius II or Costans	341–346 or 347–348	AE, nummus	Bust r.	Two Victories, each holding wreath (victoriae dd auggg nn)	2.34 g 15.30 mm		201011
			Uncertain attribution	late 3th/4th c.	AE, radiate fraction or nummus	Illegible	Illegible	3.74 g 22.90 mm incomplete		201010
			Arcadius (?), Aquileia or Rome	395–403	AE4	[DN] AR?CA[DIVS…]. Bust r.	Victory and captive, cross in field (*salus reipublicae*)	0.81 g 13.00 mm incomplete	RIC X, p. 322, n. 1237 (Aquileia); p. 324, nn. 1245–1246 (Rome)	201021

Table 4.9 cont'd Pievina, coin finds by stratigraphic context, within which organized chronologically (FM).

Phase	Archaeological Context	SU	Authority and Mint	Date	Metal and Denomination	Obverse	Reverse	Weight and Size	Reference	SF
2.1 contd'	roof collapse	1029	Uncertain attribution	mid-5th c.	AE4 or minimus	Illegible	Illegible	0.61 g 9.50 mm		201027
			Uncertain attribution	mid-/second half 5th c.	AE4 or minimus	Illegible	Illegible	0.34 g 8.90 mm incomplete		201030
		1019	Tetratchy, oriental mint	295–307	AE, radiate fraction	Illegible	CONCORDIA MILIT[VM]. Prince and Jupiter	2.25 g 21.40 mm		201007
			Uncertain attribution		Unclassified	Illegible	Illegible	0.28 g fragment		201035
2.2	layer above roof collapse	1018	Drusus Caesar, Rome	22–23	AE, as	[DR]V[VS] CAESAR [TI] A[V]G F DIVI A[VGN]. Head r.	[P]ONTI[F T] RIBVNI[POT]ES[T ITER]. SC in center	9.70 g 29.30 mm	RIC I^2, p. 97, n. 45	201004
			Uncertain attribution	late 4th/fist half 5th c.	AE4	Bust r.	Illegible	0.86 g 12.70 mm		201016
			Uncertain attribution	second half 5th c.	AE4 or minimus	Illegible	Illegible	0.14 g 7.00 mm		201033
	beaten earth (above SU 1018)	1008	Uncertain attribution	second half 5th c.	AE, minimus	Illegible	Illegible	0.28 g 7.00 mm		201031
	rubbish pit and its fill	1006	Julian Caesar, Constantinople	355–361	AE3	[D N CL IV] LIANVS NO[B CAES]. Bust r.	Falling horseman (*fel temp reparatio*). In exergue, CONS[.]	1.48 g 15.60 mm	RIC VIII, p. 460, nn. 138, 140–141, 143, 145, 147; LRBC II, p. 87, nn. 2050–2052	201012
modern	topsoil	1500	Claudius, Rome	41–50	AE, as	[TI CLAVDIV]S C[AESAR AVG PM TR P IMP]. Head l.	S – C to l. and r. of Minerva (?)	8.40 g 28.00 mm	cf. RIC I^2, p. 128, n. 100	201005
			Umberto I, Rome	1893–1894	AE, 10 cent ?	Head l.	Probably [10/ CENTESIMI/198.?]. Trace of wreath of laurel and oak	9.54 g 30.30 mm	cf. Pagani 1965, p. 34, nn. 613–616	201034
		3001	Faustina I or II, Rome	141–161 or 161–176	AE, as	Bust r.	Illegible	9.06 g 23.90 mm		201002
			Constans Caesar or Delmatius Caesar	335–338	AE, nummus	[…]CAES. Bust r.	Two soldier with one standard (*gloria exercitus*)	1.62 g 15.80 mm		201020
			Uncertain attribution	second half 4th c.	AE3	Illegible	Trace (Victory to l.?)	0.98 g 16.70 mm		201015
			Uncertain attribution	second half 4th c.	AE3	Illegible	Trace (Victory to l.?)	0.80 g 14.30 mm incomplete		201018
			Valentinian II, Theodosius I, Arcadius, Rome	383–387	AE4	Bust r.	Two Victories facing one another, each holding wreath (victoria auggg)	0.65 g 11.10 mm incomplete	*LRBC* II, p. 62, nn. 785–788, 791–793	201013
			Uncertain attribution	mid-5th c.	AE4 or minimus	Illegible	Illegible	0.61 g 10.50 mm		201028
			Uncertain attribution	mid 5th c.	AE4 or minimus	Illegible	Illegible	0.27 g 8.90 mm incomplete		201032
			Uncertain attribution		AE, unclassified	Illegible	Illegible	0.18 g fragment		201037

Fig. 4.23 Pievina, coins (SF 201001–SF 201010 + 201034) (SCE).

hoards of the 5th c. or in well-dated stratigraphic contexts (Cepeda 1991:10–12; Asolati 2005:16; Spagnoli 2013:524 and n. 14). On the other hand, the two radiates of Diocletianic date, to which may be added a possible illegible example from the same period (SF 201010), have dimensions not compatible with those of the AE3 minted from the mid-4th c. onwards, and it is possible that they were lost prior to 330 AD, when a monetary reform removed from circulation the highest value coins (Depeyrot 1992:55). The three pieces in question seem to point to occupation of this date, otherwise unattested in the areas excavated, and should be regarded as residual in the strata (SU 1019 and 1029) in which they were found.

The site yielded some 11 securely dated 4th c. coins, seven of which could be ascribed to an issuing authority and/or date. With the exception of the three examples listed above, issues of the first third of the century were absent. After a caesura of some 30 years, the next 4th c. attestations are well represented with the most common types issued after each reform: two examples of *Gloria Exercitus* (335/336–340), an example of the *Victoriae Dd Auggq Nn* (341–348) (Depeyrot 1992:63), three from the *Fel Temp Reparatio* series with a fallen horsemen from the years 348–361. Closing the 4th c. is an example of the *Victoria Auggg* series with two facing victories from 338–387 AD. Given the standard and constant weights of the majority of the issues represented, one cannot exclude the continued circulation of these pieces throughout the whole of the 4th c. until the mid-5th c.

Excluding an example with a victory dragging a prisoner (*Salus Rei Publicae* type, probably attributable to Arcadius [395–403]), and another example datable between the end of the 4th and 5th c., the rest of the 13 coins seem to date from the mid-5th c. on the basis of their weight, being largely illegible. These 5th c. coins, AE4 or *minimi*, constitutes the largest chronologically coherent group found on the site. A

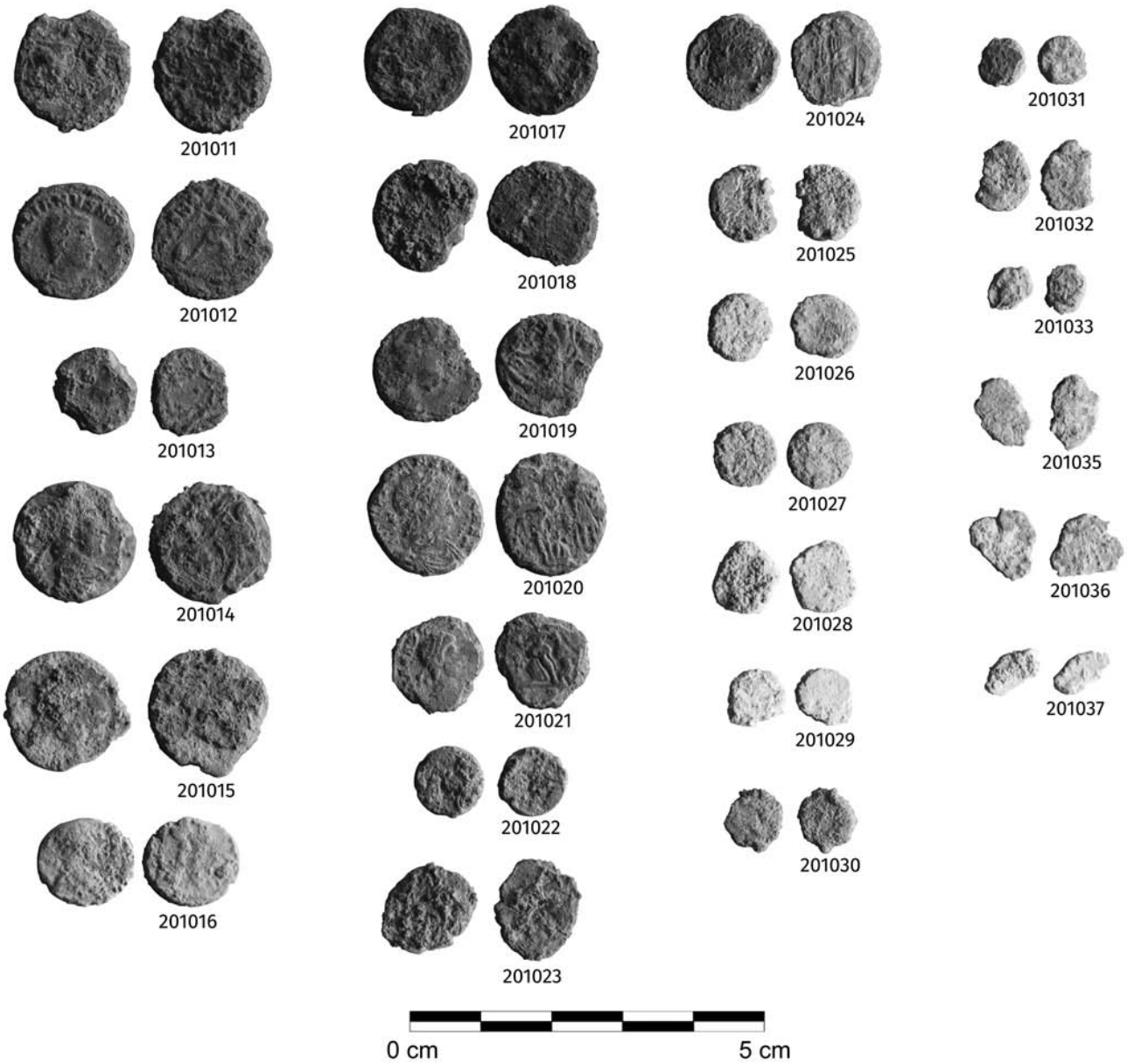


Fig. 4.24 Pievina, coins (SF 201011–SF 201037) (SCE).

margin of chronological uncertainty exists, however, for a badly preserved example 7 mm diameter and 0.28 g weight (SF 201031), for which a date after the middle of the 5th c. cannot be excluded.[6]

The coins from Pievina permit some observations about coin circulation both on the site and beyond. Between the end of the 3rd and 2nd c. BC and the 1st c. AD, the modest increase and use of Roman coins documented for the *ager Rusellanus* (De Benetti and Catalli 2013:42, 48–54; De Benetti 2013; De Benetti 2015:244–246) is also found here at Pievina, in four coins from the Republican period and three from the early empire, apparently deriving from Phase 1 use, but found in secondary (mostly topsoil) contexts.

As noted also in a number of urban and rural contexts, the quantity of coins increases in the final phases of the empire (Cuglia and Williams 2007; Spagnoli 2013:524 and n.16). From the contexts of the final phases and abandonment of the late antique Pievina come 22 coins. Aside from some clearly

residual pieces, the majority of these coins dating from the 4th and 5th c. represent those currently in circulation during the first half of the 5th c.

Only five coins derive from the latest phase of occupation (Phase 2.2) and the composition of this material is similar to that the preceding phase. This is explainable on the one hand by the very short period between the abandonment and collapse of Structure 4 and the new occupation of the area, and on the other hand by the formation processes of the SU 1018 leveling fill created over the roof collapse, in which a higher incidence of residual materials, including ceramics, were found. It is interesting in this regard to signal the presence of a very low-value *minimus* in the new living surface (SU 1008). Even though illegible, the dimensions permit a *terminus post quem* for this phase of use in the third quarter of the 5th c.

It is interesting to note the appearance of a significant number (33%) of coins of low value (AE4 and *minimi*) dated to the late years of the 4th c. through the middle of the 5th c. These same issues are largely absent from most Tuscan sites. Other contexts, not only rural, seem to show an interruption of bronze coinage already at the end of the 4th c. (Degasperi 2003:558–559) and the same dynamic is visible in some luxury residences like the villa of San Vincenzino (Bochicchio 2012), Ossaia (Laschi 2014), and Capraia e Limite (Marani 2018).

It is noteworthy that the coins of the second half of the 4th c. remain in long use (for Italy see Marani 2016:29–44), thus the absence of later examples need not necessarily indicate the cessation of monetary circulation on a given site. Moreover, in the course of the 5th c., Rome becomes the only active mint in western empire for bronze coinage, and consequently the money supply in central Italy becomes progressively less diffuse. At the same time, the near total lack of documented 5th c. coins on many sites becomes difficult to explain, particularly in urban contexts or trade/economic contexts which are, from other evidence, clearly still active through the 6th c. in which there must have been small-scale transactions. It is possible that external factors may have influenced the reduced visibility of *minimi* of the 5th c. and beyond, such as the methods of excavation in which tiny finds like *minimi* would have been missed or a general disinterest in late antique contexts. This is almost certainly the case at Luni (Bertino 1983:266) and probably at Roselle and its territory, in which coin finds end with the 4th c. (cf. Celuzza and Cygielman 2013; De Benetti 2013; De Benett and Catallii 2013). The difficulty of dating these coins only on the basis of dimensions, given their near total illegibility, also contributes to the lacuna. In relation to this last point, it is worth remembering the important quantity of coins from the h*orrea* di Vada Volterrana (some 1464 illegible examples) (Facella 2004:48–49) and from Cosa (85 coins are attributed to the 4th–5th c.) (Buttrey 1980:34, 57; Buttrey 2004:259), which were classified in a very summary fashion, and among which are probably some erroneously dated 5th–6th c. examples.

The excavations of the last years have shed new light on this problem. Areas like Tuscia (Arslan 2009:987–992), urban sites like Pisa (Baldassarri 2011) and Luni (Bertino 1983), even extra-urban sites like San Genesio (with some 70 examples dating to the end of the 4th–5th c. until the 5th–6th c.) (Cantini 2008:74) have all yielded evidence for bronze coin circulation for the 4th and 5th c. and beyond.

The finds from Pievina thus seem in alignment with the emerging picture for continued coin circulation through these centuries, in particular, the use of coins in small rural sites, site types which are still infrequently excavated but which seemingly had access to coins for small-scale exchange on par with larger and more important sites.

4.10 Small Finds (SCE)

The metal finds from Pievina provide supporting evidence of both animal use and craft production. Like the ceramic and faunal evidence, however, metal finds are unequally distributed with the majority deriving from late antique contexts.

Secure evidence from the first phase of Pievina is scant. From the dump (SU 2003) associated with the late Republican kiln comes a particularly enigmatic object consisting of two rings and two large protruding teeth or spikes (SF 301010) (Fig. 4.25). This type of find (also called double rings or *anelli gemini*), commonly with three or four spikes, is widespread in Italy and continental Europe from the Iron Age onward, and its unusual form occasioned some debate around the turn of the 20th c. as to its precise function. They were formerly called bow-stretchers or bow-pullers (*Bogenspanner*, *tira archi*), ostensibly with the archer holding the rings and using the

Fig. 4.25 Pievina, metal small finds: double rings/siguette (SF 301010); harness buttons (SF 301052, SF 301056); vessel handle (SF 301049); shuttle thread (SF 301058) (SCE).

teeth to pull back the bow. There is no supporting evidence for these objects' use in archery, nor does the size of the rings appear to be intended for the human hand. Saglio (1873:389, fig. 473) includes it in his entry on archery. It is not known when this interpretation first arose (Morse 1894:152). Strobel (1888, 1889) argued that this object type served as a part of the apparatus of the *siguette* or *cavesson* and was inserted into the horse's nose and attached to the reins, or under the chin or in the mouth of the horse. Although depictions of bridles in the Roman world do not offer evidence of the double-rings used in this way (White 1975:95; cf. Bishop 1988:60–90 for depictions of cavalry harnesses), Strobel's interpretation currently remains the most plausible solution to the question of this object (Sannibale 1998:222–235; Zampieri 2000:12).

A comparison for the *siguette* from Pievina comes from Roselle: one example currently in the Archaeological Museum of Grosseto was found in the archaic house by the amphitheater and is datable to the period ca. 625–550 BC. Given the wide geographical and chronological distribution of this type of find (and hence of that particular habit of animal training), this particular correspondence is not surprising. It might be worth asking what type of draft animal was employed at Pievina. Most interpretations regarding these double-rings take for granted that they were used for horses, but it is equally possible that it might be used on oxen or other bovines. Equids were lacking from the zooarchaeological record of late Republican/early imperial Pievina, but, given that such animals were not typically used for consumption, their absence in the faunal collection is not telling. In sum, double-rings could be used on either bovines or equids. In addition, two pendant hinges were recovered, one from SU 1006, the other from SU 1008. SF 301800 (SU 1006) comprises a flat circular disc with a projecting horizontal tab, with two raised prongs on the surface, likely used to suspend it as a pendant (Bishop 1998:97, Fig. 24). Similarly, SF 301801 (SU 1018), though poorly preserved, likely served the same function.

The earliest late antique phase of Pievina (2.1), the period of the construction and occupation of Structure 4, provided only one metal find, a small iron collar or tube of undetermined function (SF 301005), which came from the floor of the structure (SU 1031). Subsequent phases of late antique Pievina provide additional finds related to the use of animals

Fig. 4.26 Pievina, iron objects: linchpin/suspension hook (SF 301006); fragments of possible agricultural implement (SF 301034 and 301069) (SCE).

for traction or transportation: two harness buttons (SF 301052, 301056) were recovered from the site (see Fig. 4.25). Both come from Phase 2.2. The difference between the styles of the two harness buttons—one is flat whereas the other is conical—would suggest either that they came from different harnesses, or that SF 301056 is a residual find and belonged to the same harness as that of SF 301052 and that there is stylistic discrepancy of buttons on the harness. Additional finds from this period include two fragments a copper alloy straight pin (SF 301060) and either an iron suspension hook, which was likely affixed to a wooden matrix, or a large linchpin (SF 301006) (Fig. 4.26).

Several other items from this phase point to weaving, leather working, and other crafts. Such finds include two shuttle threads, one (SF 301015) from the abandonment layer over the drain on site (SU 1023), the other (301058) from SU 1014, which lay directly underneath the topsoil, covering SU 1008 (see Fig. 4.25). These shuttle threads attest to the production of wool on site during the late antique phase, probably as a part of the household industry. Also present is a copper alloy awl (SF 301051), which comes from SU 1003, used in wood- or leather working (see Fig. 4.25). Other fragments include a copper alloy pin from context SU 1001 (SF 301001). One fragment of a copper alloy item, likely a finial from a vessel handle in the shape of a goose or duck head (see Fig. 4.25), comes from the topsoil context SU 3001 (SF 301049).

Two iron fragments, whose size suggests that they were likely part of some agricultural implement but whose state of preservation precludes any further identification, come from SU 1001 and SU 1506 (SF 301034 and 301069) (see Fig. 4.26).

4.11 Glass (SCE, ERR)

The total number of glass fragments from Pievina amount to 98 shards (129.5 g; EVE 3.6) of vessel glass and seven (25.4 g) of window glass (Fig. 4.27, Tables 4.10 and 4.11). The vast majority of these fragments (83) are small body fragments. Their state of preservation is overall good, with dark brown spots on some. The color profile shows the majority of shards belonged to colorless and light green vessels, with sky blue next, and finally a few shards of light yellow, blue, brown, and dark green. Diagnostic fragments are illustrated in Fig. 4.27.

The quantitative distribution of the vessel glass by its depositional phase can be found in Table 4.10. The evidence has been quantified by shard count (fr), weight (w, in grams), and estimated vessel equivalent (EVE), which is defined as the sum of the percentages of the rim and base of the vessel extant (Orton 2009). The datable forms accord generally with the occupation of Pievina Phase 2 (Table 4.11), from around the start of the 4th c. AD to the mid-to-late 5th c. AD, with fragments of a colorless stemmed beaker of form Isings 111 likely the latest vessel. The earliest potential vessels include four body fragments of a blue vessel (SF 401006), which can be attributed to the form Isings 12/AR 34 (Rütti 1991), datable generally to the 1st c. AD, as well as a base fragment of a plate (SF 401012) and a beaker (SF 401043), datable to the reigns of Tiberius or Claudius onward. These 1st or 2nd c. AD finds are consonant with the picture provided by the ceramics, which indicates that occupation of the site must have persisted to some degree outside the excavated area. The question of the abundance of glass vessels used at Pievina compared to other sites is a statistically involved question which cannot be addressed here, but in terms of the chronological distribution of the finds at Pievina, as at other RPP sites, would appear to be in sync with the general trend in Italy of the proliferation of glass vessels from the earliest decades of the 1st c. AD onward (Cool 2016:95).

Among the tableware, identifiable forms include drinking cups (beakers), plates, and bowls (see Table 4.10). Three fragments can be attributed to the aforementioned Isings 111 stemmed beaker (dating from the mid-5th to the 8th c. AD), whose disc-shaped based is preserved with a tubular rim, folded under and inward, up to the stem. This vessel appears to have been made in two separate sections, stem and beaker, which were then affixed together after a brief exposure to heat. Also present is a beaker fragment with a rounded and inward-turned rim (SF 401057). Another, belonging to the form Isings 109, datable from the mid-3rd to 4th c. AD (Rütti 1991:77), shows a cut rim, with heavy brown encrustations. Four fragments of a blue footless cup (SF 401006), typical of the form Isings 12/AR 34, mentioned above), might

Table 4.10 Pievina, quantification of glass vessels by fragment count, weight, and estimated vessel equivalent (EVE) by depositional phase (SCE).

Phase	PI Topsoil			PI 2.1			PI 2.2		
	fr	w	eve	fr	w	eve	fr	w	eve
Beaker	1	2.31	0.30	3	4.63	0.49	1	5.61	0.24
Beaker Isings 106	—	—	—	5	16.29	0.75	—	—	—
Beaker Isings 106/109/111	—	—	—	1	0.89	0.13	—	—	—
Beaker Isings 109	—	—	—	4	3.83	0.15	—	—	—
Beaker Isings 111	—	—	—	3	4.14	0.50	1	1.16	0.23
Beaker Isings 12	—	—	—	—	—	—	3	4.37	0.07
Bowl	1	5.17	0.05	—	—	—	—	—	—
Plate	—	—	—	1	14.22	0.10	—	—	—
Small Amphora/Jug	—	—	—	1	3.96	—	—	—	—
NonId	5	2.72	—	36	45.24	0.12	32	14.95	—

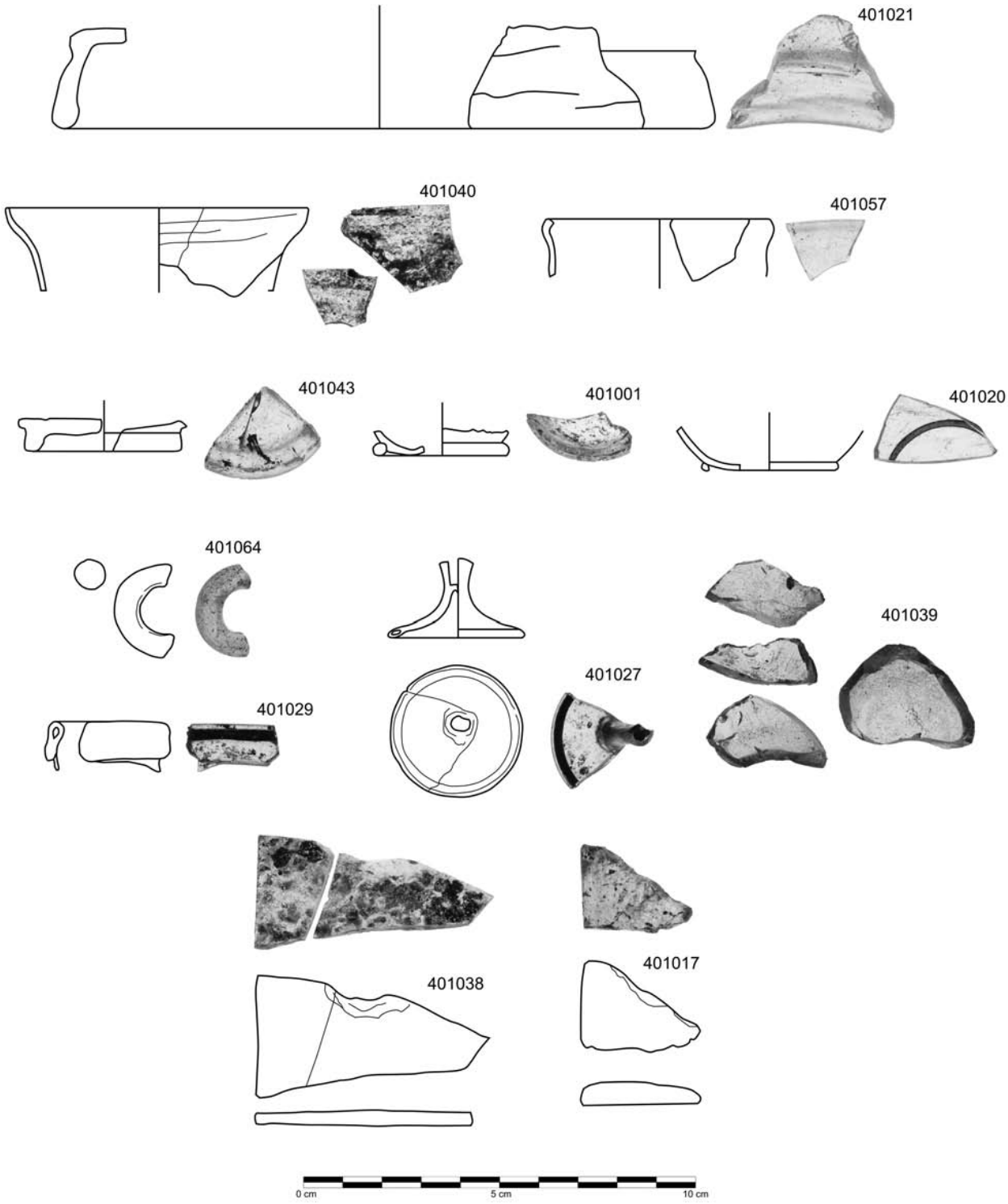


Fig. 4.27 Pievina, diagnostic glass fragments (SCE).

Table 4.11 Pievina, chronological distribution of glass vessels and their depositional phase (SCE).

Phase	Color	Form	SF	Dates (ca.)
2.2	Blue	Isings 12	401006	1–100 AD
2.1	Light Green	Plate	401021	35–230 AD
2.2	Light Yellow	Drinking Glass	401043	35–120 AD
2.1	Colorless	Isings 109	401040	250–500 AD
2.1	Colorless	Isings 109	401045	250–500 AD
2.1	Sky Blue	Isings 106/109/111	401057	250–800 AD
2.1	Light Green	Drinking Glass	401039	360–415 AD
2.1	Colorless	Isings 111	401027, 401050	450–800 AD
2.2	Colorless	Isings 111	401049	450–800 AD

also present a poorly preserved cut rim, but it is hard to discern if this is instead a break on a body shard. If a rim, the wheel-cut groove on the exterior of the vessel is located 0.8 cm below it. The footless base SF 401039 can be attributed to the form Isings 106/AR 68, in light green, dated between the second half of the 4th c. and the start of the 5th c. AD.

Plates and bowls comprise the rest of the identifiable assemblage. A fragment of a light green plate (SF 401021), with a convex exterior surface whose ring base consists of a tall, conical support, rounded on the bottom, was cast in a mold, and could date from the Claudian to the Severan period (cf. Rütti 1991:250 tab. 38, no. 810). Another ring base (SF 401043) can be compared with AR 13.2 (Rütti 1991:244 tab. 32, no. 758), a flat-bottomed cup with a low ring base.

Additional fragments include miscellaneous body shards, which occasionally contain some distinctive feature. Fragments SF 401015 and 401016 possess decoration trails infused in relief. These trails are generally applied to the belly of a bottle or under the rim of cups, which do not admit a precise dating. Bases can be grouped into two categories: those with a ring base (SF 401033, in emerald green; SF 401001, free blown with a base made of a thick trail; and SF 401020, colorless with a blue thread), and footless bases (SF 401003, 401026). Two rims (SF 401047 and 401058) are rounded and produced in colorless glass, while SF 401035 is in light green. Two rims were blown and folded over (SF 401028 and 401029), with another in light green, cut and folded outward (SF 401019), which is of an uncertain form, and could also be the edge of a ribbon handle. This fragment shows signs of deformation caused by exposure to heat. Finally, one small handle with a circular section in opaque colorless glass is too fragmentary to determine a precise form.

The window glass fragments belong to two distinct color groups, one sky blue (SF 401002, 401017, 401030) and the other colorless (SF 401014, 401067), both of which were made using casting. On SF 401017, a series of impressions were left by a tool used before the glass had completely cooled, which is comparable to examples from Spolverino and Santa Marta (Sebastiani et al. 2012; Rubegni 2015; Sebastiani and Derrick 2016). The window glass pieces all come from contexts dating to Pievina Phase 2.1, with the exception of one from topsoil (SF 401017). The dates for the window glass could range anywhere from the 1st to 4th century AD.

4.12 Building Materials (AA)

Six geologically distinct stones were identified at the site: all but one were used in the construction of the Phase 1, Structure 2 (granary), while the others were more unevenly distributed in other structures. All stone types were of geographically distinct origins, mapped here in Fig. 4.28.

1. The most frequent building stone is a bluish to light grey, fine-grained, silicious limestone,

sometimes marly, with calcite veins and rather easy to work. When angular in form, this stone was quarried from the hard and compact layers of the complex of argilloscists ("galestri") and siliceous limestones ("palombini"), an undated Flysch formation from the Secondary period ("As"). When in the form of decimeter-sized rounded cobbles, the most likely find-spots are the beds of the larger rivers (Orcia, Ombrone), which actually carry stones of that size. Minimum distance from the site ca. 2 aerial km, to the E; river cobbles 8–10 aerial km. Context used: Structures 1–2, wall 1503; Structure 4 has river cobbles.

2. Less frequent is a very friable volcanic stone, rich in whitish transparent minerals and other inclusions. This derives from the "ignimbrites" of the acidic Monte Amiata volcanic complex, dated to the Plio-Pleistocene ("Vu"). It can be described as a generally tuffish-conglomeratic stone with angular elements. Minimum distance from the site ca. 12 aerial km, to the E. Context used: Structure 2.

3. Still less frequent is a friable yellow sandstone with small, white, transparent, micaceous inclusions. This derives from the "Serie Toscana" of the Tertiary period, specifically of the Lower Miocene. They are described as sandstones and sand-schists and are known as "macigno" ("Ma"). Generally, they are not used as building material, since they are too friable. Minimum distance from the site ca. 6.5 aerial km, to the W. Context used: Structure 2.

4. Rare is a hard, reddish grey, crystalline sandstone. This may be derived from the quartz-calcareous sandstones of the "pietraforte" type outcropping E of the site and near Montenero ("Pf"). In the outcrops to the E, we found this formation to be a dark grey sandstone, whereas near Montenero, the formation is generally coarser. Minimum distance from the site ca. 5 aerial km, to the E. Context used: Structure 2.

5. Very rare is a strongly weathered, grey volcanic tuff with large, white, leucite crystals. This stone probably belongs to the leucite bearing lavas of the Vulsini volcanic complex, the closest known outcrop of which is near Orvieto, at a distance of ca. 55 km to the E. According to Antonelli, Napi, and Lazzarini (2001) and Peacock (1980), in Roman times this stone was used widely in Italy for carving millstones. Minimum distance from the site ca. 60 aerial km. Context used: posthole 1557, reused as a prop.

6. A fine-grained, hard, light-colored, tending to layered conglomerate, locally dark reddish ("Pf") was found in a couple examples. The origin of this stone is located near Montenero, at distance of ca. 7 aerial km to the NE. A similar stone was viewed by the author in the San Genesio excavations (Università di Siena–Pisa), where it was used as a (flat round) millstone. At Pievina, where it was found reused in the kiln (2003) and Structure 2 walls, it also may have been used originally as a millstone, as it was shaped on one side.

4.13 Discussion (KB)

The surface survey at Pievina revealed agglomerated, discrete scatters of late Republican date, and a smaller number of more concentrated scatters of late antique date. The earlier site was thus identified as a "village"' with possible kiln, and the late antique site as a "house" or "farm." The excavations suggest that both of these designations are at best oversimplifications. A more sophisticated interpretation is hampered by our having excavated only a percentage of the total surface scatters.

Only 7.5% of the late Republican site (of a scatter area of ca. 4,450 m^2) was excavated: the excavated scatters revealed a possible cistern, a possible granary, an ephemeral exterior hearth and a kiln site. That is, the multiple clusters of surface ceramic material and geophysical anomalies, interpreted as the detritus of multiple forms of the same kind of spaces—peasant houses—were found upon excavation to be several structures of distinct function, none of which was a "house." Without these domestic structures, we cannot be certain if the production and storage buildings served a single-family group or multiple family groups. The six unexcavated surface concentrations (TU 284, 285, 288, 289, 290, 291) may represent these houses, or they may be further service buildings.

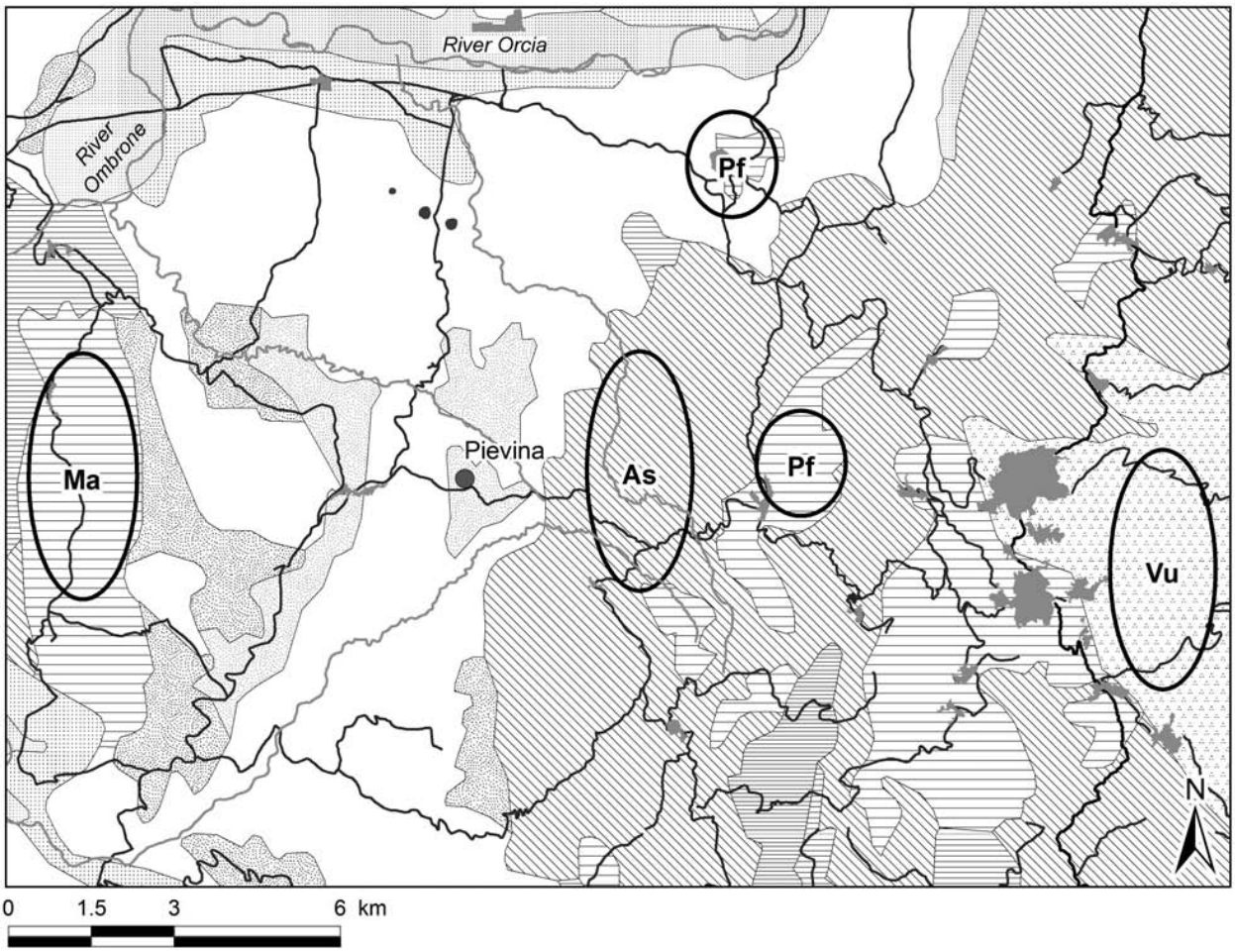


Fig. 4.28 Pievina, map showing nearest geological outcrops of building stones (AA).

Similarly, the discrete late antique scatters that were labeled "house" or "farm" were revealed to be a (probably) contiguous site with a single, small structure (Structure 4) and no functional outbuildings. The discrete surface scatters (some 3,250 m^2) were largely produced not by Structure 4 (only some 80 m^2), but by the tens of square meters of beaten earth and ceramic surfaces that surrounded it.

The identification of Structure 4 as a "house" is also somewhat problematic. No installations associated with cooking or sleeping were found. Eating is the primary "domestic" activity documented through ceramics and faunal remains, while cooking is secondarily attested to by the large assemblage of cooking wares. The small finds assemblage, with its two possible shuttle threads, tools, and other elements of craft production, plus its impressive collection of both vessels and, enigmatically, window glass, all indicate a domestic site, but the absence of items of personal use and adornment (hair pins, rings, clasps) is somewhat strange.

The relatively good stratigraphic sequences at Pievina, combined with attention to depositional histories, suggest a rapid sequence of construction, abandonment, and refurbishment. The stratigraphic sequences in the hearth and the more ambiguous reuse of millstones in Structure 2 both suggest late Republican installations with short use-lives. The thin abandonment layers in Structure 4, combined with the subtle changes in African red slip ware supply likewise suggest that the late antique "house" (Phase 2.1–2) was occupied for a short time before it was replaced by the repaving and dumping episodes of Phases 2.2. The African red slip ware and coin sequences suggest that these changes could have taken place within as little as 30 years or less, or as long as 60. These results, along with the catastrophic landslide that separated the two major phases, tentatively describe population(s) in constant flux, modifying their production, storage, and habitations in generational or sub-generational time.

Likewise, the maps of the findspots for building stone describe two very different moments of landscape exploitation. In the late Republican period, Structure 2 made use of five types of stone ranging from a minimum distance of 2 aerial kilometers to 12 or more. These stones lie in both high and low movement potential areas, from the relatively inaccessible areas at the foot of Monte Amiata, where the volcanic material and sandstones were probably gathered, to the relatively more accessible light-grained limestones and yellow sandstones to be found to the W of the site. How so many stones of different origins came to the site is interesting to contemplate: rather than a single trip for the explicit purpose of gathering stone for building, we might envisage the slow accumulation of stones culled over many trips to different areas or, more likely, the recycling of a variety of different buildings which themselves presented a variety of such stones (see Ch. 16).

The late antique inhabitants, by contrast, exploited much closer and consistent resources, in the form of river cobbles from the distant (8–10 km) but readily accessible Orcia and Ombrone riverbeds to the N and NW. The socles of Structure 4 were built wholly of these cobbles, as were the drains, pointing to a very different, possibly more focused, mode of collection aimed at these river sources, and in keeping with the relatively short duration of the site.

More hypothetical pictures of human/land relationships can be culled from other data. The possible granary (Structure 2) and the reused millstones point to the production most likely of some kind of grain. The best soils for grain lie in the gently rolling land to the W: the site has the best visibility and surveillance potential in this direction, and these lands topographically would have been the most accessible. The disadvantage of these clayey Calcari-Vertic Cambisols is the potential difficulty in plowing them (see Ch. 3). This, combined with the possibly smaller breed of cattle raised at Pievina, strongly indicates a September–October plowing regime, when moisture levels were higher than in the summer but lower than in the winter, and a harvest probably in June.

The Monte Amiata foothills to the east of the site are more challenging to access due to steep river crossings, but important incentives existed to push past these obstacles, and the presence of volcanic Amiata stones in Structure 2 suggest Pievina's inhabitants did so. The generally small quantities of forest animals in the faunal collections (like deer and boar) suggest those incentives were not necessarily meat. These forests may have been source of nuts and wood-fuel. Perhaps the most important resource to the E was the possible road that provides the only natural passage towards and through the Amiata mountains. The unexpected Volsini-complex millstones from Orvieto might have come to Pievina

from the coast via the Ombrone, one example of the kind of incentive that would prompt the negotiation of physical obstacles.

In studies of peasant agriculture, water typically is assumed to be a resource that determines farm placement. At Pievina, local hydrology emerges as both an opportunity and a challenge. The sand/clay interface that may have helped push groundwater to the surface may have been exploited by the construction of a cistern (Structure 1) and led to the creation of surface water at the western *fontone*. But groundwater was also a problem. The same geology that produced the groundwater source seems to have slumped and produced the landslide that covered the site in the late 1st century AD. The network of drains around late antique Structure 4 points to the urgent need to protect the site from hill run-off, while the succession of beaten earth and ceramic surfaces of this phase may have been intended as water-shedding mechanisms, as well as protection against subsidence and the erosion of the local, sticky clay.

Pievina yielded ample evidence for storage, surplus, and artisanal production. The late Republican inhabitants could store a minimum of 245,000 liters of water in the ca. 14 x 7 x 2.5 m cistern, which was presumably used to water surrounding gardens. They were also probably producing surplus grain: a granary measuring 12 x 5 m filled with wheat would have had a capacity ranging from 14,130 to 28,260 kg.[7] The absence of archaeobotanical study for this site makes this only an assumption. They also produced roof tiles: whether or not the tiles were intended solely for auto-consumption or exchange is unknown. The excavated portion of the late antique site, on the other hand, revealed no production or storage apparatus.

The faunal evidence presents a somewhat different picture. The relatively high cattle numbers (relative to other sites in the region) and high age at death suggest a preference for animals that produced work, food, and secondary products over the elite Roman diet of pig, which produces no work. The mix of species in both periods similarly points away from market-oriented production and towards risk-reduction strategies and auto-consumption, while butchery patterns further point towards household consumption. On the other hand, the preponderance of work cattle even at the tiny late antique site, and the siguette and the harness buttons strongly supports the use of animals—cattle in the late Republican period and possibly donkeys in the late antique period—for traction.

The ceramic data indicate that the inhabitants in both periods were tied to a trans-local exchange network. The majority of ceramic goods came from regional sources, including regional amphora production. A certain, still unquantifiable, percentage of those "regional" productions may have been sub-regional or even local. A small percentage is imported. It is most likely that all non-locally produced goods, that is, imported and regional products alike, were distributed through local or regional channels—perhaps the city of Roselle, whose roughly contemporary ceramic profile is so similar to Pievina's. Thus, while the products may be trans-Mediterranean, Pievina inhabitants would have accessed them through more proximate exchange networks—the travelling merchant, the village or periodic market, the day-long journey to Roselle, or exchange with neighbors.

The sheer range of goods associated with the activities of cooking and eating is worthy of comment. Some 20 different functionally specific ceramic types (excluding dolia and lamps), including seven distinct kinds of cookware, six different kinds of plates and bowls, and four different forms for holding or distributing beverages (see Table 4.3), attest to a desire for and access to highly specialized objects for cooking and eating. The glass vessel forms are similarly diverse. During late antiquity at least, this range of forms roughly parallels that at a nearby urban center like Roselle, confounding any assumptions that inland, poor farmsteads had neither the access, resources, nor desire for the same kind of eating/cooking specialization. Although the late antique contexts studied were admittedly much larger than the late Republican, contrary to recent claims that rural sites lacked sophisticated or even minimally functional ceramics (Ward-Perkins 2005), the diversity of functional forms actually increased in late antiquity.

In the late antique phases, small-value exchanges were often carried out with coins. While a small percentage of the 37 coins came from residual contexts, the majority came from late antique rubbish tips or the Structure 4 abandonment/collapse levels. Nearly all are low-value AE4, bronze that was often devalued (Burnett 1987:128, 131–132; Depeyrot 1992:40–46, 52–55).

NOTES:

4.1 Portions of this chapter are modified from Ghisleni et al. 2011. Thanks to the British School in Rome for permission to reuse some sections of that publication.

4.2 Survey visibility was rated 3=excellent.

4.3 All ^{14}C analysis was performed by CEDAD, Università del Salento.

4.4 The comparative data are from Roselle SU 5147=5170 and 5141 (MNI 165). This count excludes sherds classified as 'unknown' or 'generic' owing to poor preservation/small size; at Pievina it was possible to specifically attribute all sherds in SU 1006.

4.5 On the weight of *nummi* of the 4th–5th c. used to discern general chronology, see Mac Isaac 1972; Arslan 2003; Asolati 2005:56–63.

4.6 Owing to high levels of corrosion, the weight value of the coin is unreliable making dating difficult. The reduced diameter, however, might suggest one of the issues of the 3rd quarter of the 5th c. (see Arslan 2001:85–90).

4.7 Assuming a wheat conversion factor of 785 kg/m^3 (Gentry 1976:25). Minimum assumes grain stacked to height of 0.3 m, maximum of 0.6 m (Blöck 2019). Weight capacity for other grains or a mixture would be somewhat less.

5

Case Nuove[1]

5.1 Situation (AA, EV, MG)

Case Nuove is located atop a small hilltop (300 m asl) on the modern wine and olive production estate and medieval castle of Colle Massari (Fig. 5.1) in the western part of the study area. As will be described below, this small hilltop lies at an important geological intersection that may have influenced the site's function. Likewise, the hill also lies at the intersection of two possible routeways through the region, an E/W ridge-way that connects the site to Pievina and other sites to the E, and a N/S route, preserved in 19th c. cadastral maps, that runs out of the region to the coast.

The most important site near Case Nuove is the region's only villa, located 500 m to the N at the site of Santa Marta (Ghisleni 2009; Campana 2012–2014) (Fig. 5.2). An ongoing project here that included surface collection, magnetometry, and excavation, now suggests that Santa Marta began as a farm with barns and productive facilities, including a press tank, in the late 1st c. BC, but was totally rebuilt in the later 1st c. AD as a luxury residence and bath, while the productive quarters were largely abandoned until being reused for metal(?) production in late antiquity (Vaccaro, pers. comm.) As will become apparent below, the transformation of Santa Marta has a significant impact on the interpretation of Case Nuove.

Other, smaller sites near Case Nuove include a cluster of three small sites to the NW, and a line of sites identified as large farms/villages with accompanying satellite work sites to the S (see Fig. 5.2). The relationship between the Case Nuove production site and these sites will be considered in detail below.

5.2 Remote Sensing (MG)

Surface survey carried out in 2008 revealed a small site comprised of three discrete clusters of materials measuring 28 x 13 m; 13 x 12 m; and 10 x 10 m (TU 447, 448, 449, respectively) (Fig. 5.3), including river cobbles, roof tiles, and ceramic sherds in a density ca.1–3/m^2, including Italic sigillata (found to derive from Marzuolo, see Ch. 10) as well as some late Roman cooking pots and Color-coated ware.[2] Theses scatters, plus the presence of overfired tiles, led to the identification of the site as a habitation with possible kiln, an annex to the villa of Santa Marta, home perhaps to some of its workers (Ghisleni 2010).

Magnetometry analysis was carried out over a 50 x 50 m grid. A major circular anomaly (A1) was located in the grid's SE quadrant. To the NW of this, two smaller anomalies (A2–3) were detected on a line running SW by NE, while a fourth anomaly (A4) lay some 15 m to the north of A1. The strength, size, and

Fig. 5.1 Case Nuove, aerial view of hilltop before excavation (2007) (MG).

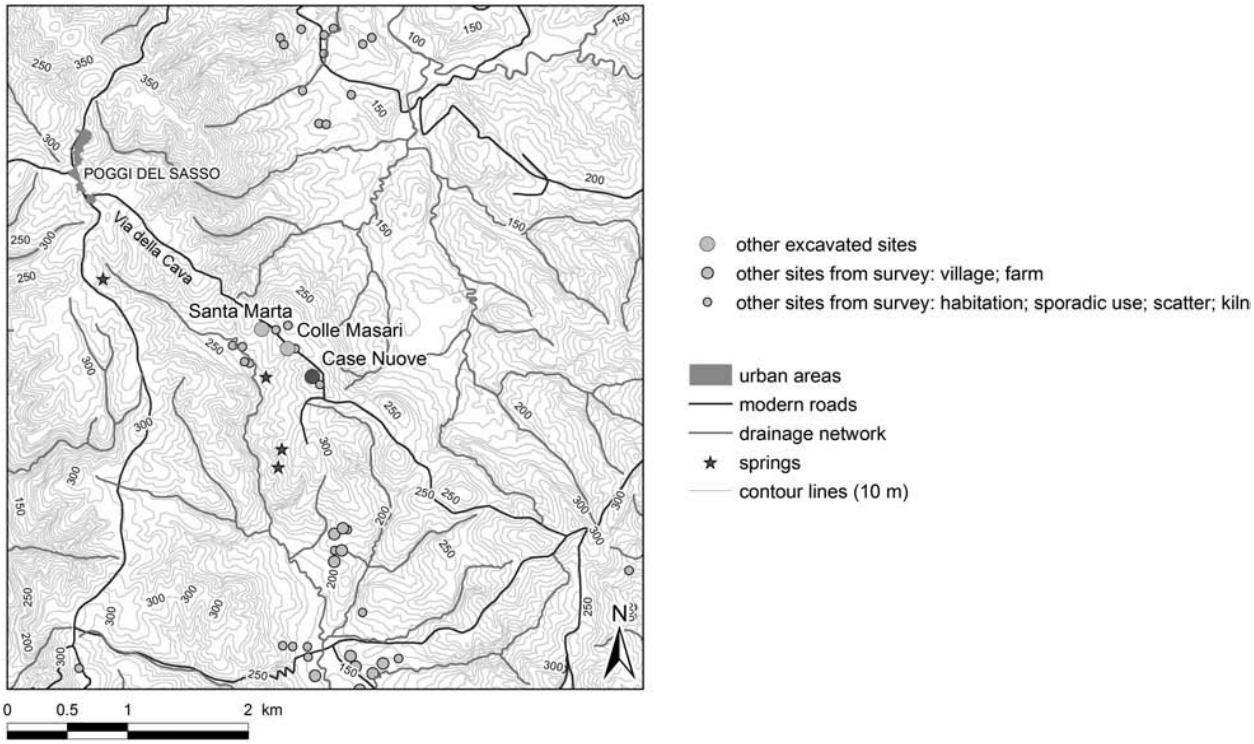


Fig. 5.2 Case Nuove, general topography, Roman sites and springs (AA).

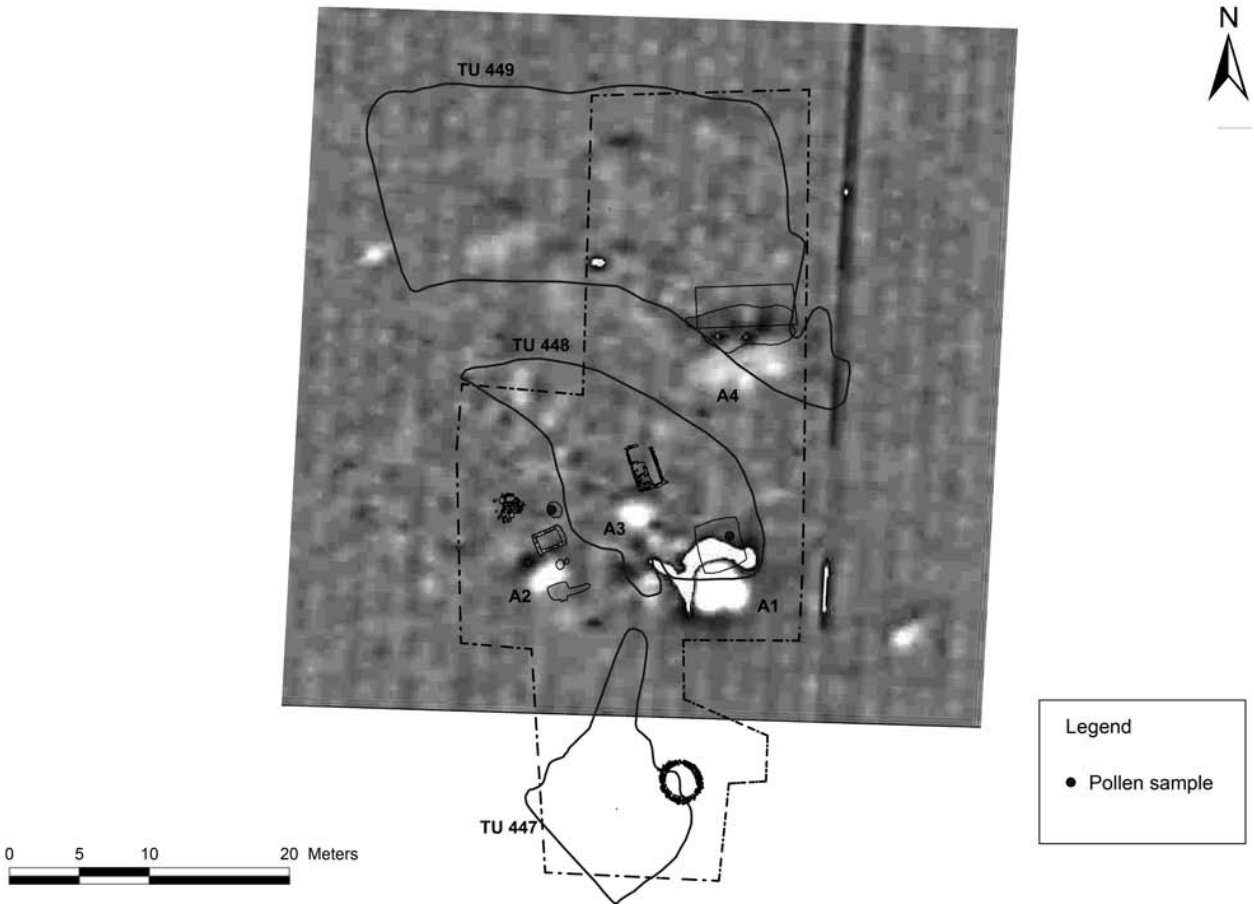


Fig. 5.3 Case Nuove, remote sensing results, overlaid with excavated remains (ERZ/MS).

shape of A1 suggested a kiln site and supported the initial identification of a tile production facility.

5.3 Excavation (KB)

Excepting a zone to the NW, the majority of the area that produced either surface scatter or magnetic anomalies was excavated, with a further extension to the south, for a total excavated area of 1,000 m² (Fig. 5.4).

Archaeological strata were encountered immediately beneath the topsoil in many areas, while in others the topsoil lay atop the natural geology. The discovery of plow marks in and around both of the excavated *opus signinum* surfaces, and the general absence of preserved stratigraphy between features, pointed to poor stratigraphic preservation owing to both natural erosion on this exposed hilltop and later plow damage. Thus, nearly all intact stratigraphy was found inside negative features (tanks, pits, etc.) and virtually none identified between these features. The absence of connecting stratigraphy made it difficult to document their chronological and functional relationships.

Phase 1.1: Late Republican pressing installations

The earliest occupation on the site was dominated by two, or perhaps three features built of *opus signinum*, plus cuts associated with these features. The central of these was a rectangular tank (SU 5005), whose NE/SW orientation follows the slope of the hill in this area. Lined with *opus signinum* and measuring 2.5 x 1.5 x 0.44 m, the tank had a capacity of ca. 1,650 liters and had a slight depression off-center to permit the last remains of liquid to be bailed out (Fig. 5.5).

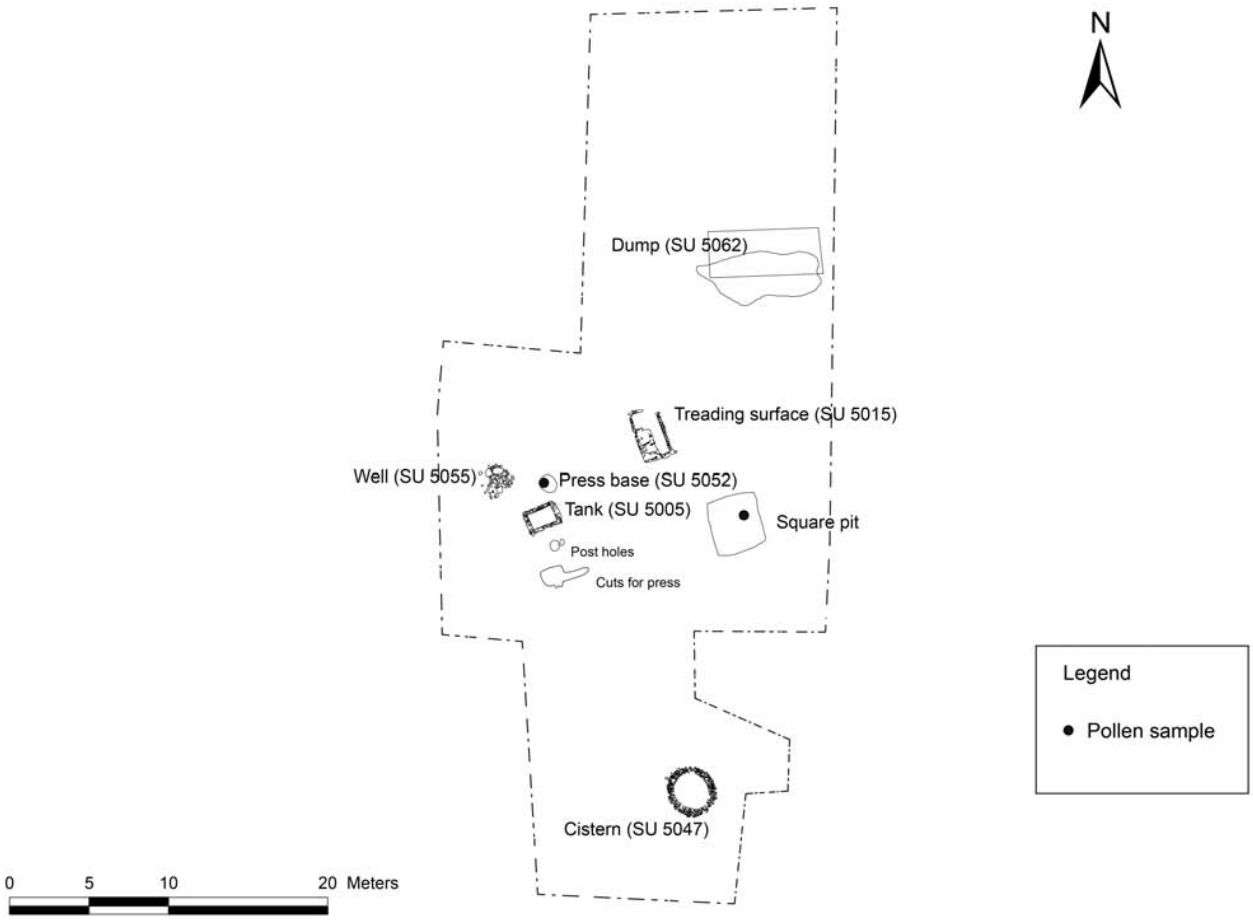


Fig. 5.4 Case Nuove, overall site plan (ERZ/MS).

No pipes, channels, or other connection were found extending from this tank. However, four installations were found in the immediate vicinity. To the S, two postholes were uncovered 90 cm from the tank's edge (SU 5068 and 5064) (Fig. 5.6). The larger (SU 5068) measured 0.55 m in diameter and was at least 1.26 m deep: we were unable to excavate to the bottom. The second, some 0.08 m to the E, was smaller at 0.30 m in diameter. Its hole was 0.78 m deep and angled toward the larger posthole, suggesting a buttress or support leaning against the larger post. The great depth of both holes, and the absence of any other postholes in the area, suggest the erection of something that required a particularly stable anchor, probably part of a press.

To the S of these postholes lay a cut feature of unusual shape (SU 5066). A narrow, long cut, running northeast by southwest—that is, along the slope of the hill and parallel with the tank—opened into a shallow, rectangular cut, in the south side of which were two more short, narrow cuts. This cut was interpreted as either a basin or channel or, more likely, the excavated base for a square stone anchor-point and beam-slot, respectively.

Immediately to the north of the tank, a shallow, circular cut was unearthed, measuring 0.58 m (diameter) and ca. 0.26 m deep (SU 5052). We tentatively identified this cut as the base for a robbed-out circular stone, here either robbed for reuse or by plowing action. The fill of the cut (SU 5051) was largely empty of finds or organic material, but a few sherds of Color-coated ware suggest it was filled in the mid-imperial or late Roman period.

Finally, to the west of the tank was a deep, stone-lined structure (SU 5055) (Fig. 5.7). Measuring 1 m in diameter and at least 3.17 m deep (the bottom was never reached), the structure was lined with medium-sized, unworked, marly limestone laid together

Fig. 5.5 Case Nuove, view of *opus signinum*-lined tank (SU 5005).

Fig. 5.6 Case Nuove, view of post holes south of *opus signinum* tank, with students illustrating depth and orientation.

without mortar. The fill of the structure contained very few ceramic finds, thus its date and abandonment are unclear. The structure was identified as a well on the basis of its extreme depth and relatively narrow diameter, too narrow for use as a silo or other storage facility (cf. Rudling, Butler, and Wallace 2010).

A second *opus signinum* feature (SU 5015) lay some 8 m to the E of the tank/press complex, revealed on the geophysical survey as A3 (Fig. 5.8). The feature was a rectangular surface cut into the hillside and measuring 3.50 x 2 m and some 0.30 m in thickness. While badly damaged by plowing, enough remained of the edges to ascertain that the surface had been surrounded by a wide lip, also of *opus signinum*, which originally stood to a height of about 0.10 m. The remains of a dividing lip were visible, separating the southern third of the surface, but no other channels or divisions were preserved nor were any other connecting drains or installations found in its immediate vicinity. This installation was identified as a work surface, whose thick base pointed to its use for some kind of compressive activity, such as mashing, kneading, or treading.

At the site's northern limit was a large (18 m^2) oval cut (SU 5062), revealed on the geophysical survey as anomaly A4 (Figs. 5.9 and 5.10). The cut contained a mixture of small pebbles, seemingly derived from the local bedrock conglomerate (see below), broken *tegulae* and *imbrices*, large fragments of broken dolia, and an assemblage of domestic ceramics and animal bones. This mixed fill spread out and covered the cut, while the stratigraphic contexts of which it was comprised assumed a variety of orientations, suggesting a series of tips. The cut was identified as a dump and its contents as construction debris (including excavated conglomeritic bedrock) from the site's various *opus signinum* installations, as well as a lesser amount of debris from the site's use period. The large number of ceramic joins found between contexts suggests a relatively short period of use, while the fragmented nature of both the ceramic sherds and animal bones indicate a dump containing debris from periodic cleaning/sweeping, rather than the large-scale disposal of rubbish.

The furthest southern point of the site was marked by a large, circular tank, almost certainly a cistern (SU

Fig. 5.7 Case Nuove, view of well (SU 5055).

Fig. 5.8 Case Nuove, plan, treading surface (SU 5015) (ERZ/MS).

Fig. 5.9 Case Nuove, view of dump (SU 5062) from E.

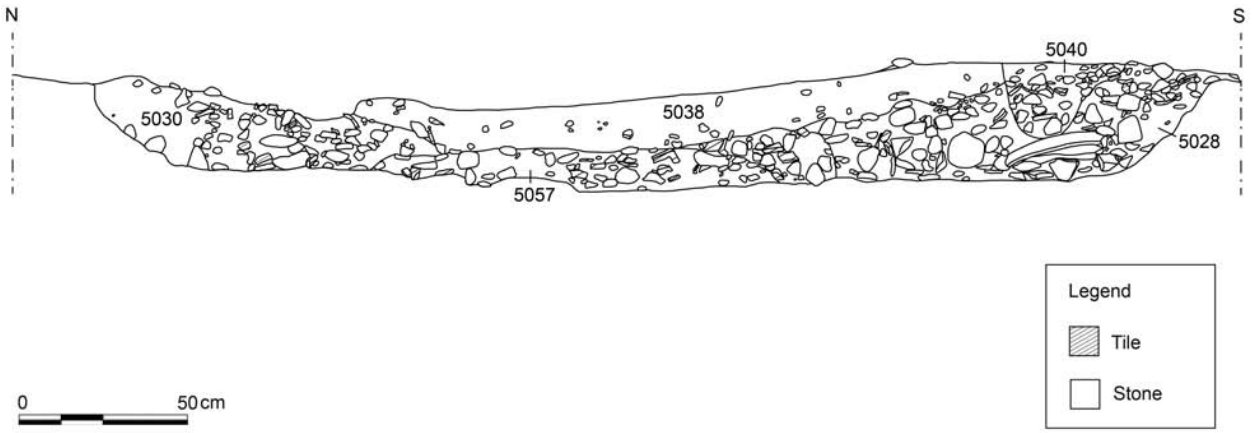


Fig. 5.10 Case Nuove, dump (SU 5062), S section (ERZ/MS).

5047) (Fig. 5.11). The geophysical survey did not extend to this part of the hill. Measuring 2.9 m across and 1.9 m deep, the cistern was lined with *opus signinum*. A small cavity for collecting the dregs of water was set in its floor while collapse recovered inside the cistern indicated that the whole was originally covered by a domical roof composed of *opus caementicium* with stone and reused tiles. The absence of any piped entrance or egress suggests that the cistern collected rainwater and was vaulted to prevent evaporation.

The absence of connecting stratigraphy meant that the assignment of these various features to the same use period was based on an assumption of shared function, a *terminus ad quem* provided by the dump, and a *terminus ante quem* provided by the fills of the tank, postholes, and other features. The cuts around the tank seemed to function in concert with it, almost certainly as the remains of a primitive pressing installation. The work surface shared the same construction material as the tank and was likewise associated with some sort of pressing activity. Thus, we have assumed that both features functioned at the same time. The dump likewise contains construction debris from the excavation of these *opus signinum* features into the hillside and is placed in the same phase.

The two points of uncertainty are the well and the cistern. As the bottom of the well was never reached, its construction date is uncertain. There were no ceramics to date construction or abandonment, while two ^{14}C dates from associated charcoal from the lowest excavated layer dated to the medieval period (see below). We have no way of knowing if this represents a medieval fill level, or if the structure itself is medieval in date. Given its close proximity to the press installation of late Republican date, it is more likely that the well should be dated with these remains and was slowly filled over the centuries.

A similar situation prevails in the cistern: as will be described below, its abandonment took place some centuries later than the other installations, but its construction date remains unknown. It may also relate to the earliest phases of the site or may have been built somewhat later to replace the well.

Phase 1.2: Abandonment of the pressing installations

This sub-phase is marked by the abandonment of the press installations and has been provided its own phasing largely in order to single out the materials from these abandonment levels, which are quite different in character and quantity from the use-phase deposits of Phase 1.1 (see below). Abandonment fills were concentrated in the tank (SU 5014), while more minor deposits of this period were found in the postholes. The tank fill contained a major collection of ceramics, faunal and small finds: these were in an excellent state of preservation; both the lack of carnivore gnawing among the faunal remains, and the many near-complete vessels indicate a deliberate infill. The tank contained objects seemingly from the site itself (i.e., remnants of meals and possible parts of the press apparatus) as well as elements (i.e., marble pieces) that may have been brought from the villa of Santa Marta (see Small Finds section below).

Fig. 5.11 Case Nuove, view of cistern (SU 5047).

The filling (SU 5051) of the circular cut for the press base seems to have taken place somewhat later.

Phase 1.3: Abandonment of the cistern

As noted above, the construction date for the cistern was never determined; the discovery of some 2nd c. AD amphorae covered with mortar could suggest that they were used in the construction of the cistern, and, thus, that the cistern was built in that period. The original placement of these sherds could not be determined. Thus the construction date remains unknown. The abandonment of the cistern was more clearly documented by the accumulation of debris over its floor, followed by the collapse of its roof.

Phase 2: Late antique use

On the spot of the largest geophysical anomaly (A1), originally supposed to represent a kiln, a large square cut (SU 5059) was found (Figs. 5.12, 5.13, and 5.14). This cut was made into the hill's loamy clay and was approximately square (3 x 3 m) with straight edges and sides extending some 1.2 m deep. The cut was filled with successive tips of broken roof tile, some of which were over-fired, medium (20–30 cm in length) cobbles, and one whole stone hand-mill. Most of the contexts were relatively rich in organic remains, including faunal materials, as well as ceramics for cooking and dining. Sediment samples from these deposits were rich in cereal pollen; a few specimens of wheat chaff were also found. Like the late Republican-period dump described above, these fills assumed a variety of orientations and appear to be rubbish tips. The quantity of cereal pollen and macroremains, some charred chaffs including forks and rachis fragments of barley and wheat, may point winnowing or threshing taking place at the site (see below, Botanical Materials).

The original function of the pit remains unclear: it seems too regular to be simply a container for rubbish and we have hypothesized that it was made to extract clay (cf. Gadd 1986:113–114). Examination of the clay layers within the pit did not reveal clay that was

Fig. 5.12 Case Nuove, view of square pit (SU 5059) in course of excavation.

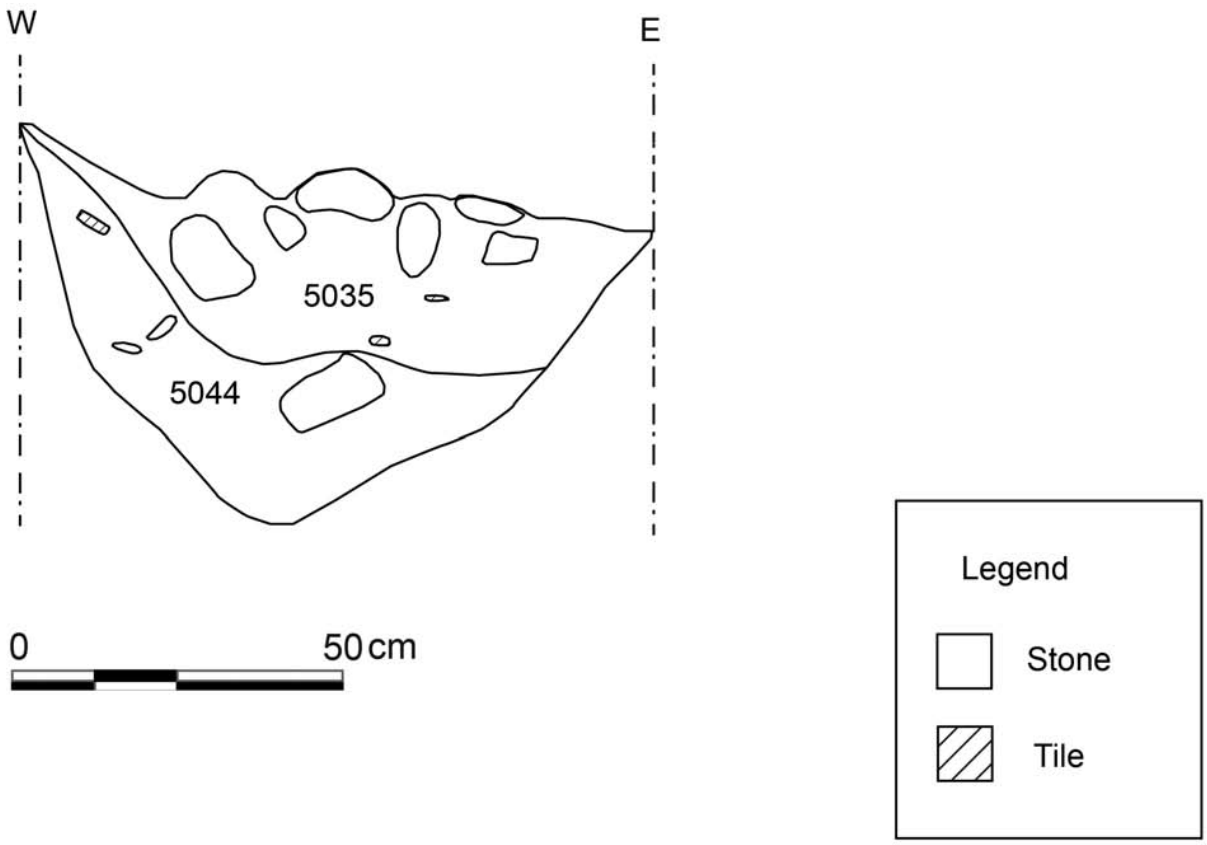


Fig. 5.13 Case Nuove, square pit, N section (ERZ/MS).

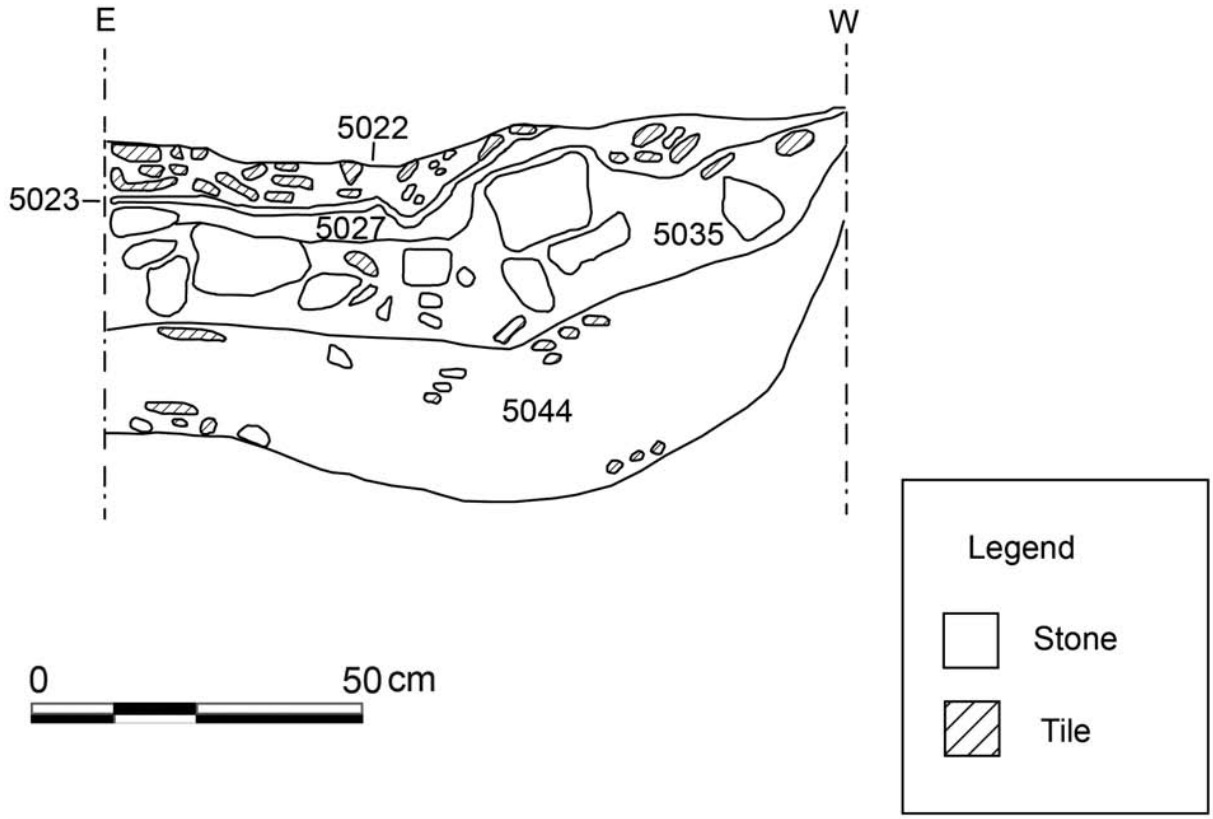


Fig. 5.14 Case Nuove, square pit, S section (ERZ/MS).

particularly fine; indeed, its loamy texture would have made it unsuitable for ceramic manufacture, although it could have been used for pisé construction, as a matrix for mortar, or for other construction functions.

Phase 3: Medieval well fills

The only post-antique levels found in the site derived from the fill of the well. Excavations never reached the bottom of this well, but the lowest levels excavated produced faunal materials which ^{14}C dating placed in the medieval period. No ceramics were found in these levels, and no botanical analysis was carried out from its sediments.

5.4 Residue Analysis (AP and MACO)

Porous materials, such as ceramic or plaster, absorb the liquid and semi-liquid substances that had contact with them (e.g., Condamin et al. 1976; Evershed 2008). Our uncertainty about the function of Case Nuove, in particular the product produced by its assemblage of equipment, led us to carry-out residue analysis on two contexts associated with the Phase 1.1 use of the site: the surface of the *opus signinum* tank (SU 5005), a porous surface composed of both crushed ceramic and plaster, and two dolia fragments, both from the Phase 1.1 dump. The dolia were of the very large variety and their presence on the hilltop is most readily explained as part of the pressing process: it is possible, although less likely, that they had been used for other purposes.[3]

Opus signinum tank (SU 5005) (Fig. 5.15): No residues that can be attributed to wine production were identified in the samples taken from the tank. In the total lipid extract from one of the two samples, $C_{18:1}$ is the most abundant peak in the chromatogram, moreover, B sitosterol is present in the sample, suggesting the presence of a plant oil in the sample (Fig. 5.15a). In the second sample, the main peaks after the standard are oleanitrile and oleamide. The presence of these

compounds is generally attributed to a contamination process. Nevertheless, in this case, their abundance suggests that a reaction of oleic acid in a basic environment could have taken place, suggesting the possible presence of a vegetable oil in the sample (Fig. 5.15b). These compounds were also identified by Alessandra Pecci and Gianluca Giorgi in African amphorae filled with lime and/or plaster recovered at Pompeii and supposed to have contained oil (Pecci et al. 2018). In the ethyl-acetate extraction of both samples, traces of azelaic acid are also present. This compound is considered to be a by-product of the degradation of oleic acid (Dudd and Evershed 1998). All these data suggest that the tank was used in the processing of a plant oil.

Dolia samples (Figs. 5.16 and 5.17): Sample 1 yielded no residues for tartaric acid, usually considered to be the marker of wine (Guash-Jané et al. 2004; McGovern 2004). However, other acids associated with wine (succinic, fumaric, and malic acids) were present in the ethyl acetate extraction. The other dolium fragment yielded both tartaric acid, and malic, malonic, and isocitric acids (Pecci et al. 2013). No traces of vegetables oils or products of Pinaceae from pine resin used to coat the vessel were present in either sample.

The residue analysis tentatively supported the notion that oil extraction was carried out on the site during Phase 1. Assuming the dolia were not in secondary use, at least one of them was used either to catch the wine from the foot press or for fermentation or to store wine produced in an other area of the site. The absence of wine markers from the *opus signinum* tank lining could indicate that the press installation was used exclusively for oil.

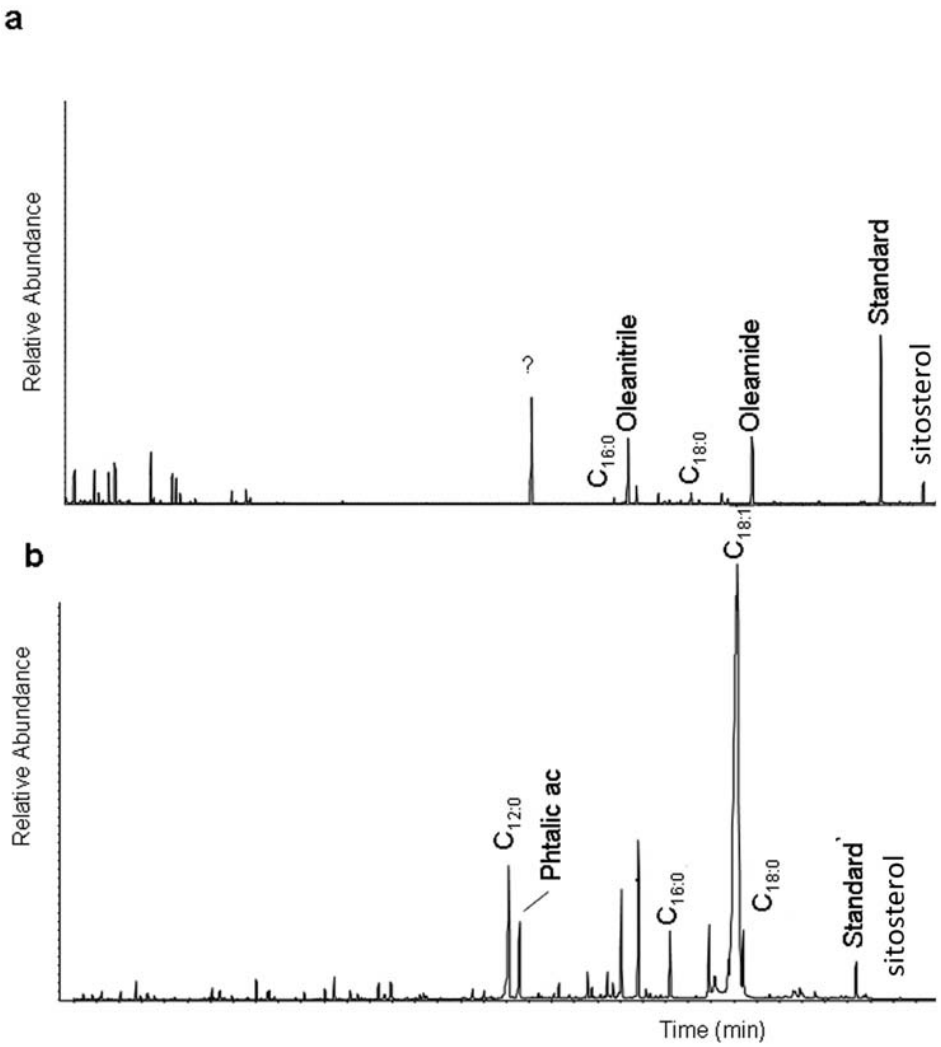


Fig. 5.15 Case Nuove, chromatogram of the total lipid extract of SU 5055 (tank), samples a and b (AP).

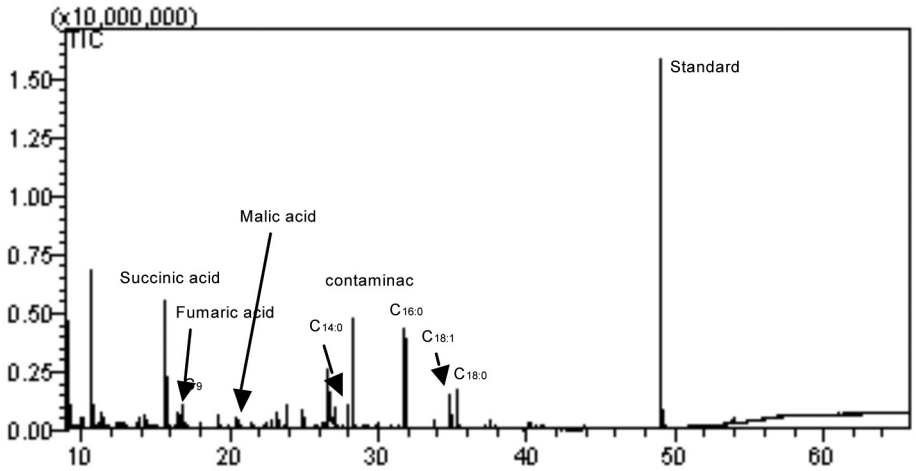


Fig. 5.16 Case Nuove, chromatogram of the hydrolysis in ethyl acetate of Dolium Sample 1 (AP).

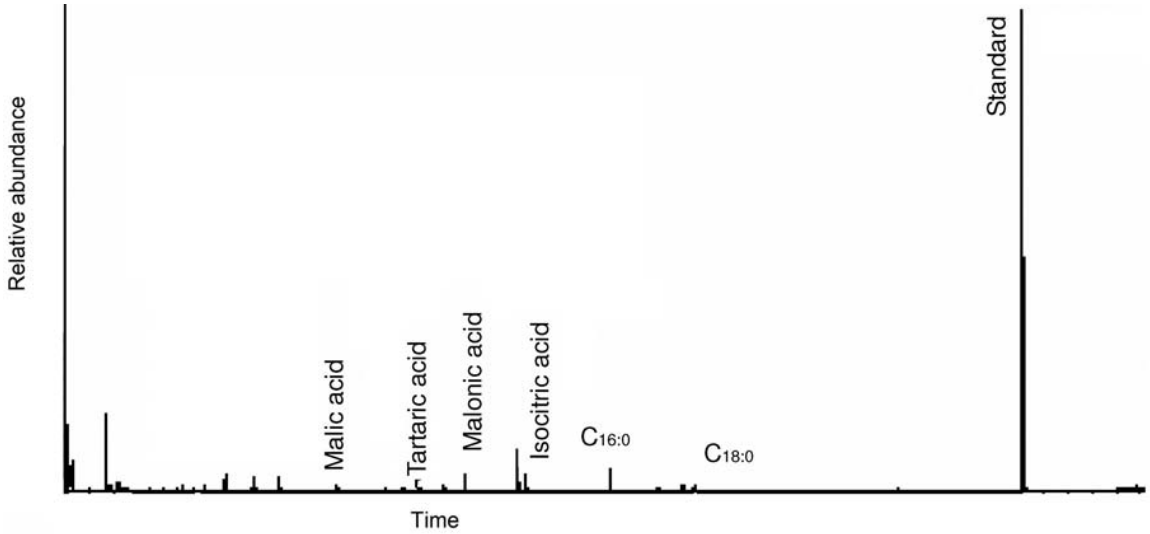


Fig. 5.17 Case Nuove, chromatogram of the hydrolysis in ethyl acetate of Dolium Sample 2 (AP).

5.5 Discussion of Excavation Results

Case Nuove in its initial, mid-late 1st c. BC phase yielded no actual covered structures, but rather a series of open-air features—a tank, a work-surface, and possible well—seemingly associated with agro-processing. Indeed, the *opus signinum* work surface finds its closest comparanda with the treading surfaces or *fouloirs* used in the foot pressing of grapes for wine. Many examples found in the Narbonnaise have the same *opus signinum* surface, half-round raised lip around the edges, and are of the same general size (Brun, Congès, and Pasqualini 1993; Brun 2005:25–27, 59), while closer to home, similar example was found next to the peasant house at Podere Cosciano (Camin and McCall 2003–04). The absence of both a drain/pipe to remove the juices and an associated reservoir is problematic, but not unique: such treading surfaces often had primitive drains and wooden reservoirs. At Case Nuove, such a drain/reservoir would almost certainly have existed along the lowest side of the surface, to the N, where the surface was heavily damaged by plowing and only superficial excavation was carried out.

Probably also related to pressing activities were the tank, postholes, associated cuts, and possibly the well. Although the joining stratigraphy had been removed, their coeval function is suggested by their close proximity. Given the presence of a tank, the circular cut adjacent to it, and postholes whose size and

shape suggests robust uprights designed to counteract significant compressive force, the complex can be most plausibly be interpreted as a press installation (Fig. 5.18).

The majority of presses excavated in Italy are from elite villas, and with their masonry bases, large grinding stones and location inside the *villa rustica*, bear little resemblance to our remains. Outdoor installations are somewhat more common in North Africa and the eastern provinces (Brun 2004), although rare everywhere almost certainly because sporadic finds of press weights and other indicators are rarely excavated. A seasonal, outdoor press site with a treading surface, tank, and even a similar dump containing excavated geology from Suale, Corsica, provides a reasonably close comparison to Case Nuove (Raux and Vidal 2017). Other examples of small facilities from villages in Liguria and Provence also provide comparanda for the small tank and rudimentary press apparatus (Brun 2004:45).

The arrangement of slots/channels, postholes, tank, and circular cut can be reconstructed as a lever press of Brun's type B21: in this scenario, the postholes supported the horizontal bar attached to a lever, anchored by a square stone represented by the square cut to the south, itself further anchored with a beam slot also cut into the ground (Brun 2003:14). The fruit would have been placed on a circular stone base, now gone, represented by the circular cut adjacent to the tank. Missing is the counterweight, which always lies next to the pressing point, in this case to the north of the circular cut in an unexcavated area. A similar version of such a press, albeit better preserved and more monumental, was found adjacent to the basilica at Kalpjuk in Salona (Brun 2004:65).

The proximity of the well to this press might suggest a coeval function. Water was an integral part of oil production, as hot water could be poured over the second and third pressings to flush out the remaining oil (Brun 1986:42–53). Other examples of wells adjacent to olive press sites have been found at Taradeau in the Narbonnaise and Posta Crusta near Foggia (Brun, Congés, and Pasqualini 1993; De Boe 1975, respectively). The hill at Case Nuove lies far from any surface water, making the construction of a well or cistern necessary. Whether or not the cistern was also in use during this period is unknown, but it may, too, have provided water for use in pressing.

Treading surfaces like SU 5015 are only used for the mashing of grapes, not olives, pointing to wine production at the site. Primitive press installations like the one preserved here, on the other hand, may have been used for oil or wine production, or both; the relatively small capacity of the tank might be more in keeping with oil production, but tank capacity is not a reliable indicator of either the type or the quantity of production, for example, the two 50 liter tanks for oil at the great villa of Settefinestre imagined to have been pressing the output from 40–60 *iugera* (10–15 ha) of olives (Carandini 1985b:164–165). Somewhat more persuasive is the residue analysis from the tank, which tentatively pointed to the presence of oil, and the macrobotanical remains from the tank itself that included both olive endocarps and grape pips (see below). Were the well part of the larger press installation, it, too, would point toward oil production. On the other hand, grapes crushed first by foot on treading surfaces like SU 5015 were typically pressed a second time in a press. We tentatively suggest that the Phase 1 site was used for the production of both olive oil and wine, both at a relatively small scale.

The site's 1st c. BC function should be distinguished from that during late antiquity, when the previous installations were filled with debris and went out of use.

5.6 Chronology (EV)

Phase 1.1 and the construction of the press installations are dated by the dump (SU 5062), which given the presence of construction debris and domestic rubbish, should relate to the construction and use of the site (Table 5.1). Black glazed wares (Morel series 1174; 2272, 2273, 2651) and amphorae (Campanian Dressel 1, Van der Werff 2) suggest the site was in use during the middle years of the 1st c. BC, probably ending prior to the last decades of that century.

Phase 1.2: The abandonment of the press installation is well dated to the late Augustan to Tiberian period by an important collection of Italic sigillata from the tank fill (SU 5014). These included forms Conspectus 20 (4 MNI), 26 (2 MNI), 33 (1 MNI), and R2 (1 MNI).

As noted above, the construction date for the cistern was never determined; the discovery of some 2nd c. AD amphorae (see below) covered with mortar

Fig. 5.18 Case Nuove, reconstruction of press installation in Phase 1 (Studio InkLink). (See also color insert.)

could suggest that they were used in the construction of the cistern, and, thus, that the cistern was built in that period. The original placement of these sherds could not be determined. Thus the construction date remains unknown.

Phase 1.3: The abandonment of the cistern was more clearly documented by the accumulation of debris over its floor, followed by the collapse of its roof. Some African red slip and amphorae provide the best chronological evidence, including Hayes 14B (1 MNI), a Baetican Dressel 20 (1 MNI), and Käpitan 2 (1 MNI), all suggesting a date in the late 2nd c. to first half of the 3rd c. AD for its disuse.

Phase 2: The square pit (SU 5059) is again dated by its fill, here a deliberate series of tips. The large number of joins between different contexts, and the generally homogenous and well-preserved faunal collections suggest that the majority of the fill comprised primary rubbish laid down over a brief period. Some abraded sherds and weathered/gnawed bone fragments indicate an admixture of secondary waste. A date in the late 4th to mid-5th c. AD is given by the African red slip ware, including Hayes 50B (1 MNI); Hayes 64 (1 MNI), and Hayes 71B (1 MNI). These dates are supported by an important collection of *sigillata chiara tarda dell'Italia centro-settentrionale*, above all large flat-based dishes imitating the ARS prototype Hayes 61A/B3 and A/B4 respectively, dated to the first half and first third of 5th c. AD, and the series of flat based dishes and bowls deriving from the type Hayes 50B.

The cut for the circular press base was also filled at or shortly before this time, its chronology provided by ARS and a sherd of Color-coated ware.

Phase 3: The latest chronologies found on the site pertained to the bottom levels of fill of the well: ^{14}C dating of the animal bones from these context yielded a medieval date ca. 1270–1400 AD.[4]

Table 5.1 Case Nuove, major excavated contexts with diagnostic ceramics/dates (EV).

Context	Chronological Information: Pottery	Total MNI	Possible date	Reliability
Phase 1				
5028/5030/5037	BGW: Morel Series 2783–2784 (1 MNI); Morel Series 1174 (1 MNI); Morel Series 2615 (1 MNI); Morel Series 2272 and 2273 (2 MNI); Italic sigillata: dish/bowl Consp. 3 or 8; Dressel 1 (1 MNI); Campanian Dressel 1 (1 MNI), Van der Werff 2 (1 MNI)	45	late 1st c. BC	Good: fills of pit
Phase 1.2				
5014	Italic sigillata: Conspectus 18 (1 MNI), Conspectus 32 (1 MNI), Conspectus 13 (1 MNI), Conspectus 36 (1 MNI), Conspectus 26 (2 MNI), Conspectus 20 (4 MNI), Conspectus 3 (1 MNI), Conspectus R2 (1 MNI), Conspectus 33 (1 MNI), one unidentifiable form. Amphorae: regional wine-amphora type, Pisan area (?) (1 MNI), wine-amphora Oberaden 74/ Dressel 28 type from Hispania Tarraconensis (1 MNI), Bertucchi 6 wine-amphora type, from the area of Marseille (?) (2 MNI).	50	mid/late Augustan to Tiberian	Good: abandonment fills of pressing tank
Phase 1.3				
5048/5058	ARS: form Hayes 14B *(1 MNI); Amphorae: Baetic Dressel 20 (1 MNI); Gauloise 4 (1 MNI); Käpitan 2 (1 MNI); generic Baetic fish-sauce type; (1 MNI); local or sub-regional wine type (1 MNI).	27	late 2nd-mid 3rd c. AD	Good: abandonment fill of cistern
Phase 2				
5006/5008/5022/5023/5024/5025/5027/5032/5035/5036/5043/5044/5057 (with several joins across the contexts, such as 5023+5024, 5036+5043, 5044+5057)	Amphora: Empoli type (1 MNI). ARS: Hayes 50B (1 MNI); Hayes 62 (1 MNI); Hayes 71B (1 MNI); SCT (10 MNI) imitating ARS prototype Hayes 61A/B3, A/B4, 50B; CCW (15 MNI) imitating Hayes 61 A/B3 and A/B4.	72	late 4th-mid-5th c. AD	Good: Fill of square pit

5.7 Ceramics (EV)

Both the ceramic and faunal evidence from the site were found to document a major change in both the site's function and its economic relationships from its major phase (Phase 1.1) as a pressing site to subsequent phases of abandonment (Phase 1.2), mid-imperial (Phase 1.3), and late antique use (Phase 2) (Tables 5.2 and 5.3). In the first phase, both ceramics and animal bones describe a community of modest means with relatively poor, undifferentiated animal diet and local trade connections. As the site was abandoned, the population that continued to frequent the site displayed a richer diet and access to luxury goods. This change may relate to changing relationships and/or the changing character of the nearby Santa Marta villa during Phase 1.2, and, we suggest, its subsequent possible control over the site during those later phases.[5]

Phase 1.1: The ceramics of this first phase were preserved exclusively in the dump contexts (SU 5028, 5030 and 5057) (Fig. 5.19). With only 45 MNI these assemblages were quite small and show a predominance of regional and local sources over imports, a phenomenon similarly noted at the contemporary deposits at the nearby peasant site of Pievina (see Ch. 4). Diversity

is moderate with eight ceramic classes and 14 distinct forms. Kitchen wares (35.55%) are the single largest class, unusually for sites of this period, followed by fine wares including a majority of Black glazed wares (15.55%) and a handful of Italic sigillata (2.22%).

The 2nd c. BC Black glazed forms are represented by a plate Morel Series 1430/40 (Fig. 5.19.1), Morel Series 1174 of a possible northern Etrurian origin, and a bowl with flaring rim Morel Series 2615 (Fig. 5.19.4). A total of 2 MNI of plates can be respectively referred to the Morel Series 2250 and 2280 (Fig. 5.19.2–3), whose production begins around 100 BC and is dated generally in the 1st c. BC. The 2nd and 1st c. BC specimens are generally characterized by a levigated and soapy fabric, whose color varies from light brown (7.5YR 6/4) to pink (7.5YR 7/3). The slip is commonly dark bluish gray in color (Grey 2 4/1) and quite dull and thin, with some brownish tones especially evident on the inside of the bases. Both the fabric and slip characteristics of the Black glazed ware tend to support production at a local or regional scale, while the overall low quality of these products would also confirm a late date in the Black glazed production. Italic sigillata forms include a dish or bowl Conspectus 3 or 8. Two MNI of Experimental sigillata (Fig. 5.19.6–7) from these contexts were found by thin section to *not* derive from the Marzuolo 30–10 BC production (see Ch. 10), but rather to the southernmost part of coastal Tuscany or Lazio/Campania, a region which also supplied Experimental wares to Marzuolo itself. A shard of Marzuolo-derived Italic sigillata was found in the surface survey (see Ch. 10).

The relatively large proportion of cooking vessels (Fig. 5.19.8–10) were of regional, if not even local, manufacture, and *vernice rossa interna* were produced in southern Etruria (Aguarod Otal 1991:37–40). Closed vessels dominate the assemblage: eight cooking pots and one cooking bowl and three cooking dishes, plus four lids probably used with cooking pots. The morphology of cooking pots is quite variable with slightly everted rims that vary from pointed to rounded lips (5.19.8 and 9 respectively). Bodies tend to be ovoid and bases are always flat. *Vernice rossa interna* cooking dishes (Fig. 5.19.11–12) are represented by the common Aguarod Otal Form 3/Luni 1, whose production started in the last two decades of the 2nd c. BC, expanded throughout the 1st BC, and declined in the 1st AD (Aguarod Otal 1991:65–67). A lesser known type, with more everted and slightly pendant rim seems to represent a transitional variant between Aguarod Otal's Forms 3 and 4. Noteworthy, too is the presence of a spatic calcite-tempered fabric in at least two cooking pots. It is considered a more advanced technology, resistant to thermal shocks due to minor thermal expansion, compared to quartz-rich fabrics (Tite et al. 2001:322). Two MNI of mortaria complement this kitchen-dominated assemblage.

Amphorae account for 8.8% of the Phase 1.1 MNI (Fig. 5.19.13–16). They are all wine amphorae representing three different sources of supply—Tuscany, Campania, and Tunisia—and include a regional production of Dressel 1, a Campanian generic Dressel 1 (indicated by the presence of many inclusions of volcanic glass) (Panella 2001), and a single Van der Werff 2, probably holding Tunisian passum wines largely employed in cooking practices (Fentress 2001:263).

The relatively small percentages of wares for dining/storing (46.66%) follow typical patterns for contemporary sites from the project: open forms dominate, although in this case unusually it is bowls (15.55%), mostly in Black glazed ware followed by dishes (8.88%). Cups are absent. Closed coarse ware forms, as is typical, are less common and dominated by beakers (6.66%) and jugs (4.44%).

Phase 1.2: The mid/late Augustan to Tiberian period at Case Nuove coincided with the abandonment of the processing activity, represented by the filling both of the tank (5014) and of the deep postholes (Figs. 5.20 and 5.21). Fifty MNI comprised this tank assemblage, of which there were only seven ceramic classes but 14 distinct forms including a rare lamp and unguentarium.

The most significant change from the Late Republican ceramic assemblage is the increased percentage of fine wares (from 17.7% to 28%). These included 13 vessels of Italic sigillata, to which we should add one lamp specimen belonging to the same class. The wide repertoire of table vessels in Italic sigillata include for plates/dishes, different sized bowls and one chalice (Fig. 5.20.2–6). The variegated repertoire of fine wares also includes one bowl/cup of the highest quality thin-walled ware (Fig. 5.20.1) with barbotine decoration and a bright red slip, comparable to specimens from Cosa in the Augustan period (Pugliese Carratelli 1985:292).

While only four amphorae were found in these contexts, they describe a wider range of connections

Table 5.2 Case Nuove, ceramic classes, all phases, by MNI and % of MNI diagnostics (EV).

Ware	Case Nuove Phase 1 (117 diagnostics/ 45 MNI)	Case Nuove Phase 1.2 (174 diagnostics/ 50 MNI)	Case Nuove Phase 1.3 (92 diagnostics/ 27 MNI)	Case Nuove Phase 2 (190 diagnostics/ 72 MNI)
BGW	7 or 15.55%	0 or 0%	0 or 0%	0 or 0%
Italic sigillata	1 or 2.22%	14 or 28%	0 or 0%	0 or 0%
Thin walls	3 or 6.66%	3 or 6%	0 or 0%	0 or 0%
Experimental sigillata	2 or 4.44%	0 or 0%	0 or 0%	0 or 0%
ARS	0 or 0%	0 or 0%	1 or 3.7%	3 or 4.16%
Color-coated ware	0 or 0%	0 or 0%	8 or 29.62%	25 or 34.72%
SCT	0 or 0%	0 or 0%	1 or 3.7%	11 or 15.27%
Late Italic sigillata	0 or 0%	0 or 0%	0 or 0%	0 or 0%
Coarse ware	9 or 20%	13 or 26%	1 or 3.7%	3 or 4.16%
Kitchen ware	16 or 35.55%	13 or 26%	5 or 18.51%	27 or 37.5%
Tunisian kitchen ware	0 or 0%	0 or 0%	0 or 0%	0 or 0%
Amphorae	5 or 11.11%	4 or 8%	5 or 18.51%	1 or 1.38%
Coarse ware/amphorae	0 or 0%	0 or 0%	0 or 0%	0 or 0%
VRI	2 or 4.44%	0 or 0%	1 or 3.7%	0 or 0%
Dolia	0 or 0%	0 or 0%	4 or 14.81%	0 or 0%
Lamps	0 or 0%	2 or 4%	1 or 3.7%	0 or 0%
Loomweights	0 or 0%	0 or 0%	0 or 0%	0 or 0%
Amphora stopper	0 or 0%	1 or 2%	0 or 0%	0 or 0%
Other ware (*tubuli*? and kiln spacers)	0 or 0%	0 or 0%	0 or 0%	0 or 0%
Thin walls/coarse ware	0 or 0%	0 or 0%	0 or 0%	0 or 0%
Color-coated ware/coarse ware	0 or 0%	0 or 0%	0 or 0%	0 or 0%

Table 5.3 Case Nuove, ceramic forms/functions, all phases, by MNI and % of MNI diagnostics (EV).

FORMS	Case Nuove Phase 1 (117 diagnostics/ 45 MNI)	Case Nuove Phase 1.2 (174 diagnostics/ 50 MNI)	Case Nuove Phase 1.3 (92 diagnostics/ 27 MNI)	Case Nuove Phase 2 (190 diagnostics/ 72 MNI)
KITCHEN (includes KW and VRI)	**20 or 44.44%**	**13 or 26%**	**6 or 22%**	**27 or 37.5%**
Generic closed forms for kitchen	0	0	0	0
Cooking pots	8 or 17.77%	7 or 14%	2 or 7.4%	18 or 25%
Cooking jugs	2 or 4.44%	0	0	0
Generic open forms for kitchen	0	0	0	0
Casseroles	0	2 or 4%	1 or 3.7%	1 or 1.38%
Cooking bowls	1 or 2.22%	0	0	0
Frying pans/*tegami*	3 or 6.66%	1 or 2%	1 or 3.7%	1 or 1.38%
Bread-baking pans/*testi*	0	0	0	2 or 2.77%
Clibani	0	0	0	0
Cooking lids	4 or 8.88%	3 or 6%	2 or 7.4%	5 or 6.94%

Table 5.3 cont'd. Case Nuove, ceramic forms/functions, all phases, by MNI and % of MNI diagnostics (EV).

FORMS	Case Nuove Phase 1 (117 diagnostics/ 45 MNI)	Case Nuove Phase 1.2 (174 diagnostics/ 50 MNI)	Case Nuove Phase 1.3 (92 diagnostics/ 27 MNI)	Case Nuove Phase 2 (190 diagnostics/ 72 MNI)
DINING/STORING (includes CW, FW and CCW)	**21 or 46.66%**	**29 or 58%**	**11 or 40.7%**	**44 or 61.1%**
Generic closed forms for table and storage	0	0	0	0
Jugs	2 or 4.44%	3 or 6%	2 or 7.4%	0
Jars	0	0	0	2 or 2.77%
Jugs/jars	0	0	0	5 or 6.94%
Beakers	3 or 6.66%	2 or 4%	0	0
Small table pot	1 or 2.22%	0	0	1 or 1.38%
Bottles	0	0	0	0
Flasks	0	1 or 2%	0	1 or 1.38%
Chalice	0	1 or 2%	0	0
Flanged-Bowls	0	0	0	0
Generic opens forms for table	2 or 4.44%	1 or 2%	0	0
Bowls	7 or 15.55%	4 or 8%	2 or 7.4%	11 or 15.27%
Cups	0	6 or 12%	0	0
Dishes	4 or 8.88%	6 or 12%	1 or 3.7%	17 or 23.61%
Bowls/Dishes	0	2 or 4%	3 or 11.11%	0
Basins	0	0	2 or 7.4%	5 or 6.94%
Lids	0	3 or 6%	1 or 3.7%	0
Small vessels for sauces or perfumes(?)	0	0	0	2 or 2.77%
Uncertain (food processing?)	0	0	0	0
Mortaria	2 or 4.44%	0	0	0
TRANSPORT and STORAGE	**4 or 8.51%**	**5 or 10%**	**9 or 33.32%**	**1 or 1.38%**
Amphora stoppers	0	1 or 2%	0	0
Amphorae	4 or 8.88%	4 or 8%	5 or 18.51%	1 or 1.38%
Dolia	0	0	4 or 14.81%	0
Table amph/jar	2 or 4.44%	0	0	0
LIGHTING	**0**	**2 or 4%**	**1 or 3.7%**	
Lamps	0	2 or 4%	1 or 3.7%	0
OTHER "FUNCTIONAL" CERAMICS	**0**	**1 or 2%**	**0**	**0**
Loomweights	0	0	0	0
Drains	0	0	0	0
Unguentaria	0	1 or 2%	0	0
Kiln spacers	0	0	0	0
Molds	0	0	0	0
Tubuli	0	0	0	0
RESIDUALS	**0**	**0**	**0**	**0**
UNCERTAIN	**0**	**0**	**0**	**0**

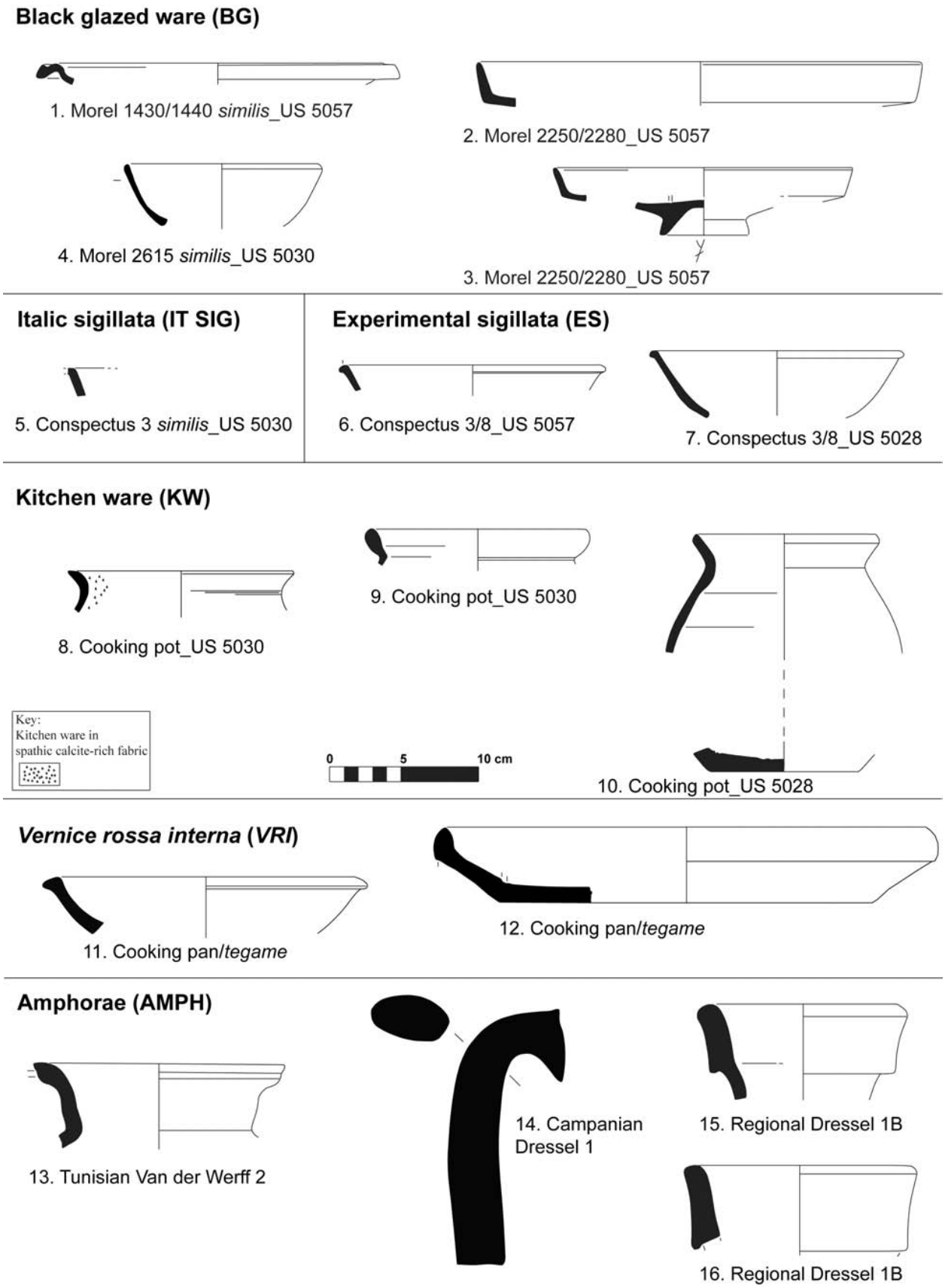


Fig. 5.19 Case Nuove, representative diagnostic ceramics from late Republican midden contexts (SU 5028, 5030, 5057): Black glazed ware (BG): 1. Dish Morel 1430/1440 *similis*; 2–3. Dishes Morel 2250/2280 *similis*; 4. Cup Morel 2615 *similis*. Italic sigillata (IT SIG): 5. Dish (early) Conspectus 3 (?). Experimental sigillata (ES): 6–7. Dishes/bowls Conspectus 3/8. Kitchen ware (KW): 8–10. Cooking pots. *Vernice rossa interna* (VRI): 11–12. Cooking pans/*tegami*. Amphorae (AMPH): 13. Tunisian Van der Werff 2; 14. Campanian Dressel 1; 15–16 Regional (*Ager Cosanus*?) Dressel 1B (EV).

for amphora-borne foodstuffs than seen in Phase 1.1: an Oberaden 74/Dressel 28 from the Ager Tarraconensis (López Mullor and Martín Menéndez 2008) and two examples of the southern Gaulish wine-amphorae Bertucchi 6 (Bertucchi 1992:113, fig.54, n.1 and 115, fig. 55), found in Ostia but not yet documented in southern Tuscany (Fig. 5.21). One probable regional wine amphora with a band-shaped externally grooved rim and grooved handles is suggested to be Pisan in origin from section analysis.[6]

The percentage of kitchen wares decreases in this abandonment phase (from 35.55 to 26%) and includes a wide variety by size and morphology. Furthermore, the ratio of closed to open vessels is slightly more balanced than in earlier contexts, with kitchen pots (14%) being used alongside casseroles (4%) and *tegami* (2%). Pots include size ranges from 8–9 to 18 cm while the morphology of rims is generally everted and slightly pointed (Fig. 5.20.15–16) or band-shaped (Fig. 5.20.17). One near complete specimen is characterized by an ovoid body, disk-shaped foot, and a sub-vertical rim on a grooved neck. The body is completely finished through an *asteccatura* decoration (Fig. 5.20.18). Its reddish gray fabric (5YR 5/2) with limestone inclusions and mica flecks and especially its shape tentatively suggest an import from outside the sub-regional area, given the absence of similar shapes in the late Republican and early imperial repertoires of southern Tuscany. Casseroles are represented by two specimens: one with flattened and grooved rim and one with everted rectangular rim characterized by a slightly pronounced and hooked lip (Fig. 5.20.19, 21). Finally, the only cooking dish documented borrows the typical morphology of the form Aguarod Otal 4/Luni 2/4, normally documented in *vernice rossa interna* ceramics, but internally non-slipped (Fig. 5.20.20).

The abundant tableware forms are dominated by open forms in Italic sigillata including dishes (12%), a return of cups (12%), and bowls (8%). Closed forms are less common, but are dominated by handled jugs in coarse ware (6%) (Fig. 5.20.10–12), sometimes provided with a lid fitting inside the band-shaped rim, thin-walled non-slipped table pots (cataloged in Table 5.3 as generic closed forms) (Fig. 5.20.14), while beakers (4%) and flasks (2%) round out the closed form table repertoire.

Phase 1.3: The mid-Roman period is the least well-documented in Cinigiano and in other inland areas of Tuscany: in Cinigiano, only five known sites continued to be occupied in the 2nd–3rd c. AD, one of which was the Santa Marta villa. For this and other reasons, the contemporary material from Case Nuove is almost certainly linked to life at the villa site, rather than evidence for a continued use of a small-scale agro-processing nucleus (Figs. 5.22 and 5.23). A small assemblage of 27 MNI was found in the abandonment fill of the cistern. With nine ceramic classes and 13 forms, it was moderately diverse but dominated by quite different wares and forms than in the previous two phases.

The single largest class were tablewares in Color-coated ware (29.62%) characterized by a non-sintered red or orange slip (Fig. 5.22.3–9). Open and closed forms include a dish (Fig. 5.22.6), a lid, bowls (5.22.3–5) and jugs (Fig. 5.22.7–9). Particularly interesting is a large bowl characterized by a single groove on the upper part of the rim and two other grooves on the external surface (5.22.4). Similar forms are widely documented in the late Roman contexts of Pievina which prompted a mid-imperial variant, possibly as an imitation of the bowl Hayes 9 in African red slip, and the continuity of production of similar forms in the late Roman period. Also in color-coated ware is finely decorated two handled-jug (Fig. 5.22.9), characterized by a band of notches and a series of punched oblique points spread across the shoulder. Aside from 1 MNI of a bowl African red slip Hayes 14B (Fig. 5.22.1), other fine wares are absent. It is important to note the 1 MNI of *sigillata chiara tarda dell'Italia centro settentrionale* (SCT) (Fig. 5.22.2), a high-quality, red-slipped ware produced in different areas of central and northern Italy after the cessation of early imperial Italic sigillata (Fontana 2005, and see below).

Kitchen wares were next in abundance (18.51%) and include the full range of functional forms, including two different types of globular cooking pots with double stepped rim (Fig. 5.23.1–2), one in a spatic calcite-rich fabric (Fig. 5.23.2), a casserole with elongated and flattened rim (Fig. 5.23.3), and finally a *tegame* in *vernice rossa interna* (Fig. 5.23.4), characterized by a thick, reddish, internal non-sintered slip and produced in a fabric rich in volcanic temper, which suggests an import from southern Tuscany, Latium, or Campania, a similar example to which was also found at Marzuolo. A balance between open and closed forms may point to mixed cooking practices of

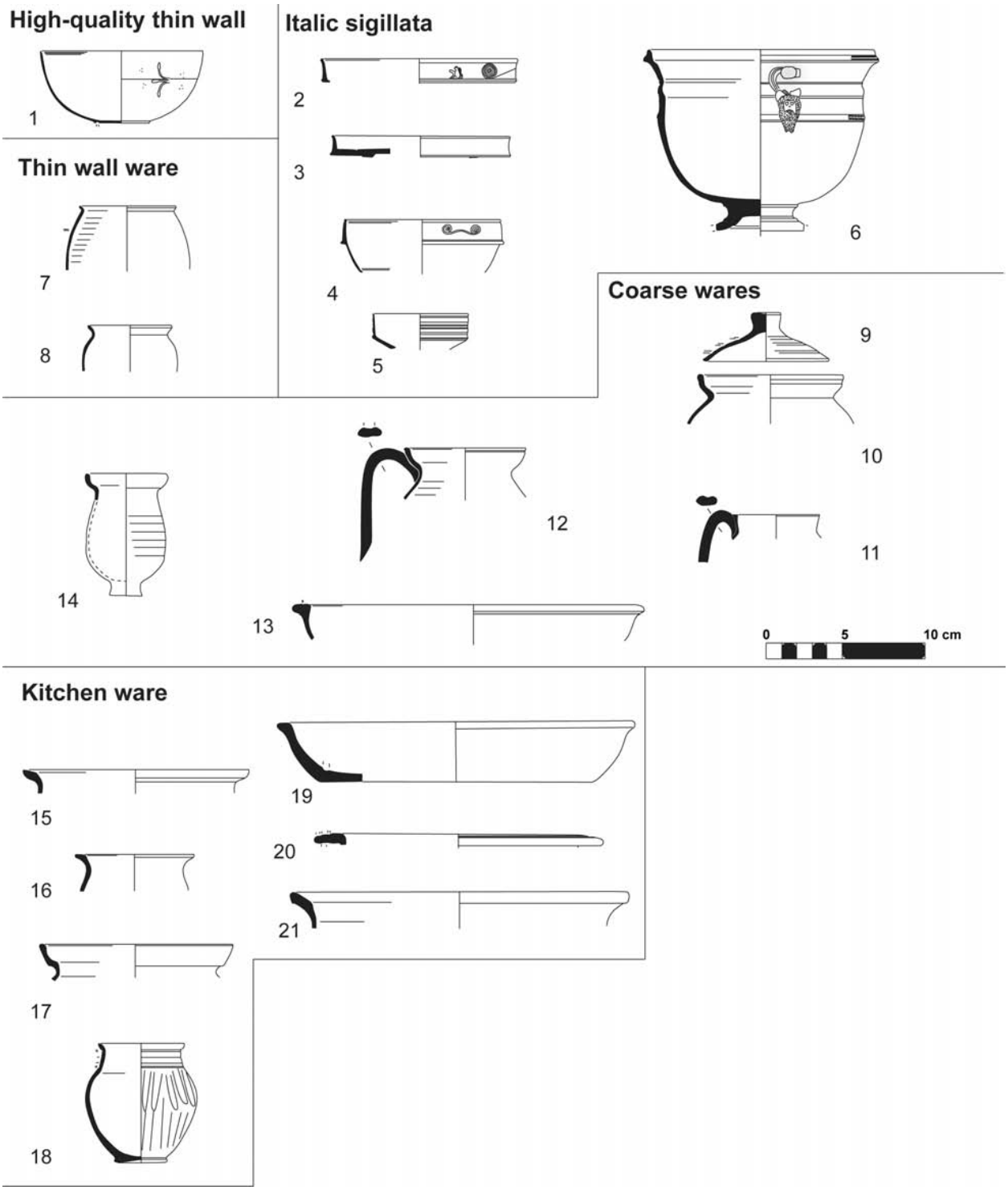


Fig. 5.20 Case Nuove, representative diagnostic ceramics from Phase 1.2, mid to late Augustan fill (SU 5014) of tank. Fine wares, coarse wares, kitchen ware. Thin wall ware: 1. Bowl Atlante II, Tav. XCIII, n.7; 7–8. Beakers/small table pots. Italic sigillata: 2–3. Conspectus 20; 4. Conspectus 33; 5. Conspectus 26; 6. Conspectus R2. Coarse wares: 9. Table lid; 10–12. Table jugs; 13. Large bowl/basin; 14. Small table pot. Kitchen ware: 15–18. Various-sized cooking pots; 19. *Tegame*/baking (or cooking) pan; 20–21. Casseroles (EV).

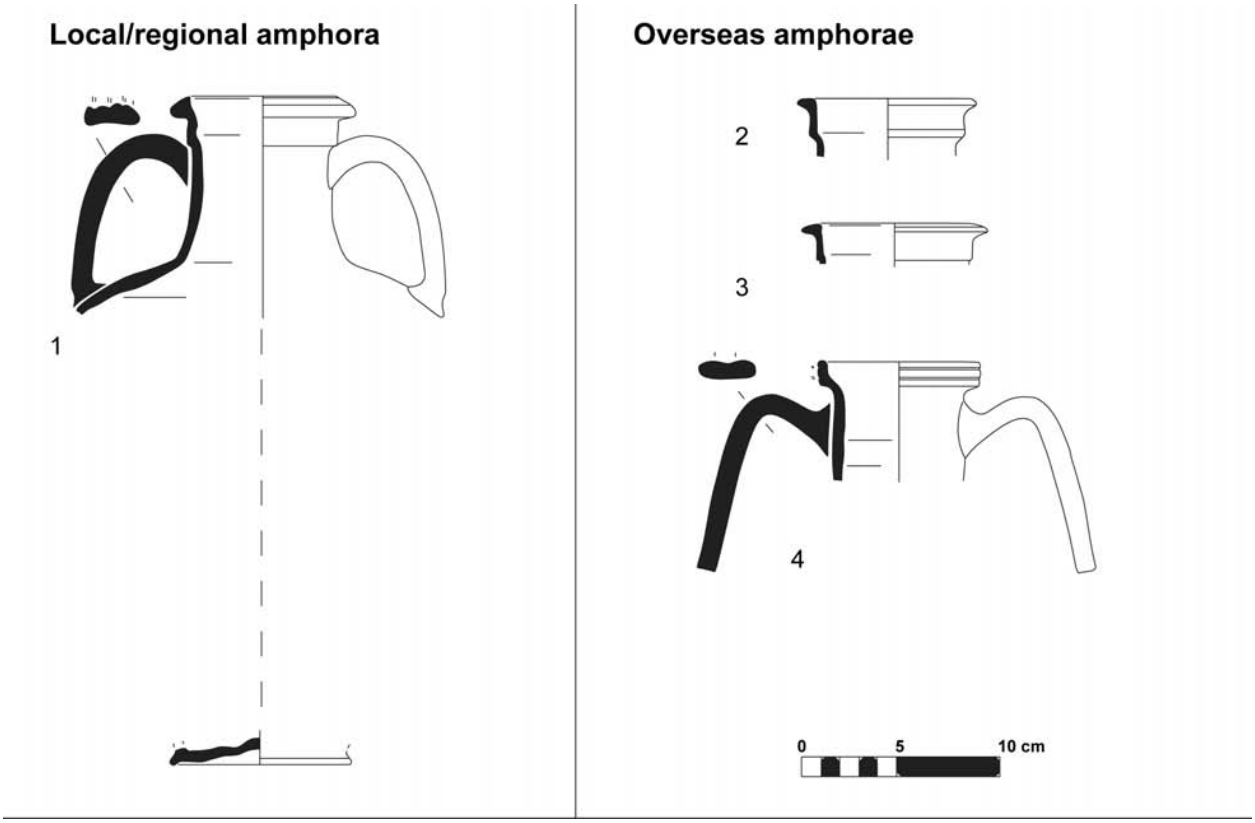


Fig. 5.21 Case Nuove, representative diagnostic ceramics from Phase 1.2, mid to late Augustan fill (SU 5014) of tank. Local/regional and overseas amphorae. Local/regional (wine?) amphora: 1. Flat-based type. Gaulish amphorae: 2–3. Bertucchi 6. Tarraconense amphora: 4. Oberaden 74/Dressel 28 (EV).

boiling and braising/broiling (see below). Also present were 4 MNI of dolia, either used for storage or as construction material in the cistern vaults.

Amphorae, though very fragmentary, are abundant and come from a wider variety of sources than in earlier periods, with three different Mediterranean production regions: Baetican (Dressel 20 and a generic fish sauce amphora), Gaul (Gauloise 4), Asia Minor (Käpitan 2), as well as a local or sub-regional wine type. Spanish and Gallic products are abundant at coastal sites but rarely documented in the inland sites in this area, while Case Nuove and Marzuolo are the first instances of Asia Minor imports identified in this inland area (Vaccaro 2010). The local/sub-regional type is characterized by a thin and slightly flaring rim, short cylindrical neck, circular-section handles attached below the rim, and a somewhat ribbed body (Fig. 5.23.6). The pinkish levigated fabric with scarce inclusions of quartz, mica, feldspar, and limestone may be compatible with a local/regional production, but different from those local/regional products found elsewhere in the project sites. Residue analysis identified traces of resin used to coat the internal surface, but unfortunately not enough traces to detect the actual content; nevertheless, according to the shape and its generic similarities with other wine-amphorae produced in central Italy (such as the Empoli and Spello types, and now those from Marzuolo [see Ch. 10]), we suggest it should have been wine.

So dominant are amphorae that the other normally dominant class, tableware, is reduced in relative percentage (40.7%). Closed tableware forms are much reduced from previous phases, and the ubiquitous coarse ware jug is present only in 2 MNI. The open form assemblage is characterized by bowl/dishes (11.11%), bowls (7.4%), and basins (7.4%)—mostly in Color-coated ware. This shift away from a near equality in closed and open form tableware towards an increasing emphasis on open forms seems to be typical of mid-Roman sites in our locale (see Ch.

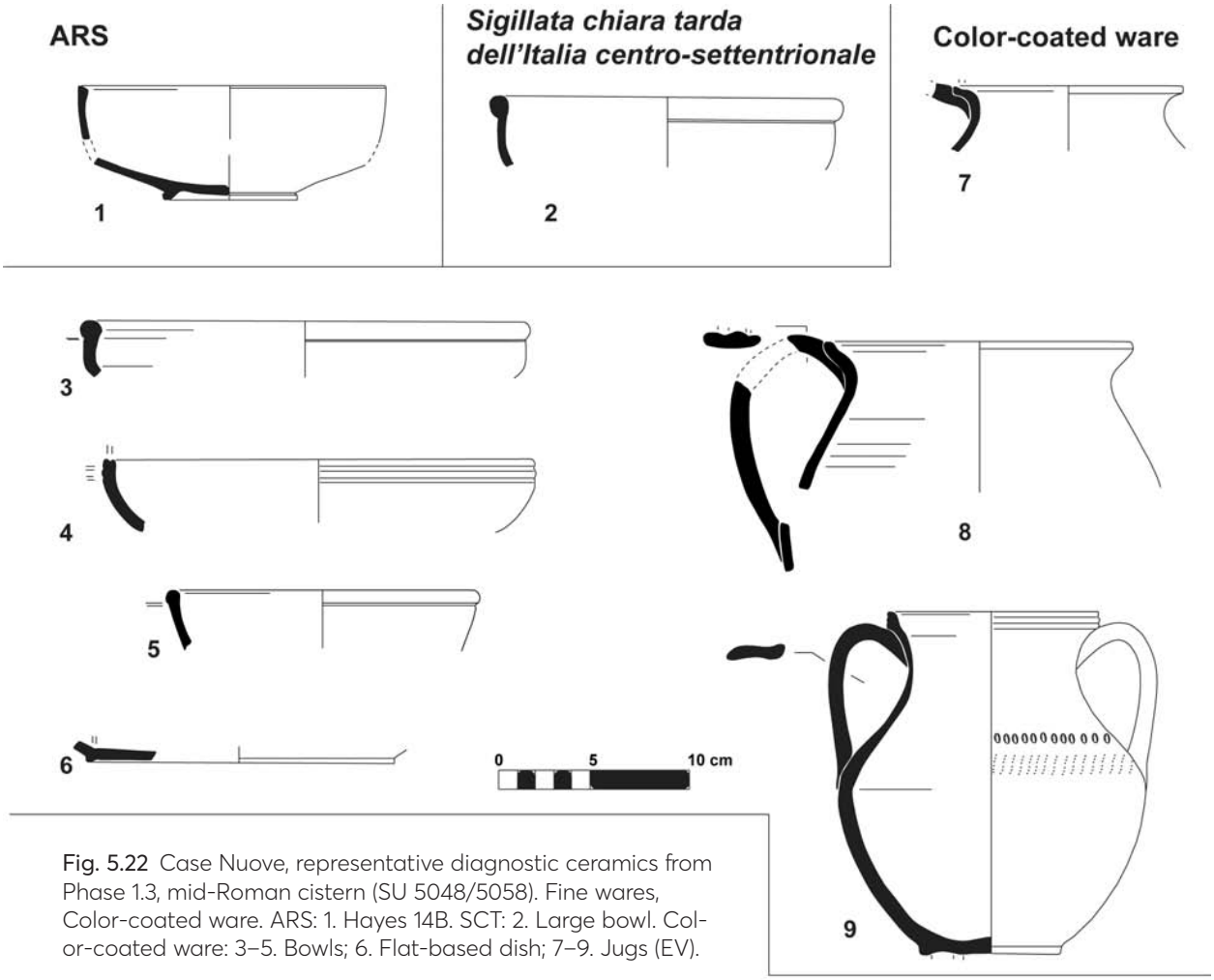


Fig. 5.22 Case Nuove, representative diagnostic ceramics from Phase 1.3, mid-Roman cistern (SU 5048/5058). Fine wares, Color-coated ware. ARS: 1. Hayes 14B. SCT: 2. Large bowl. Color-coated ware: 3–5. Bowls; 6. Flat-based dish; 7–9. Jugs (EV).

14). Finally, a single lamp was found, a rarity among our sites, a late central Italic Loeschcke (1919) type VIII or Bailey (1980) type Qii.

Phase 2: Composed almost entirely of the fills of the square pit (SU 5022, 5023, 5027, 5035, 5044), these were quantitatively the largest assemblages at the site with 72 MNI. The high number of joins and the overall similarity of ceramic typologies suggest a narrow chronological window in the late 4th to first half of the 5th c. AD (Figs. 5.24 and 5.25). The quantity of material points to as-yet unidentified activities located near Case Nuove, and/or possibly the villa itself.

Despite a more limited diversity of six ceramic classes and 14 distinct forms, the ceramic repertoire, as in Phase 1.2, reveals a predominance of fine and tablewares versus kitchen wares. Fine wares were dominated by *sigillata chiara tarda dell'Italia centro-settentrionale* (15.2%) (Fig. 5.24.14–18). While this ware was absent in the contemporary assemblages at nearby peasant site of Pievina (Ch. 4), it is plentiful at the urban sites of Roselle and Vetulonia, and occasionally present in low numbers at villa and coastal rural sites (Vaccaro 2011:53–55). *Sigillata chiara tarda* has been distinguished from Color-coated ware by its brightness, degree of preservation, and uniformity, a product of higher continuous oxidizing temperatures (Cuomo di Caprio 2007:326–329). More durable and expensive to produce, it was seemingly targeted only at higher-level sites. Most of the *sigillata chiara tarda* are in open forms, including imitations of African red slip forms like flat-based dishes in Hayes forms 61A/B3, A/B4 (Fig. 5.24.17) and above all flat based dishes and bowls deriving from the type Hayes 50B

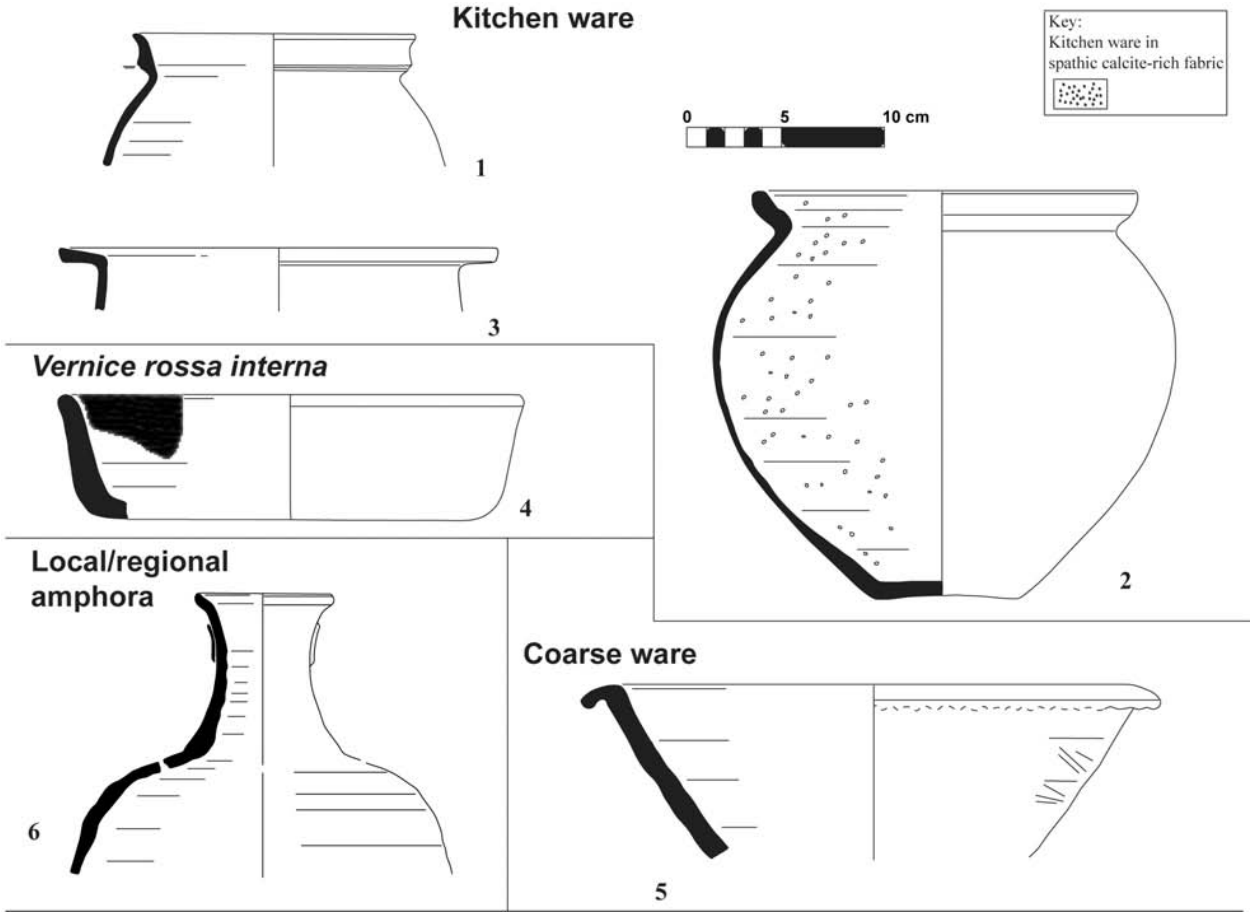


Fig. 5.23 Case Nuove, representative diagnostic ceramics from Phase 1.3, the mid-Roman cistern (SU 5048/5058). Coarse wares, kitchen ware, *vernice rossa interna*, local/regional amphora. Kitchen ware: 1–2. Cooking pots; 3. Casserole. *Vernice rossa interna*: 4. Baking pan/*tegame*. Coarse ware: 5. Deep storage basin. 6. Local/regional amphora (EV).

(Fig. 5.24.15–16). Also documented in this class are small bowls like that illustrated in Fig. 5.24.14, which refers to a production that is not influenced by the ARS models but probably derives from autonomous morphological repertoires. Interestingly this class, as already well documented (Fontana 2005), is occasionally characterized by an over-painted decoration (Fig. 5.24.18), which in one case assumes the feature of concentric circles surrounded by dots deriving from the single or concentric circles with dot-fringe typical of the styles A (ii) or A (iii) of the mid 4th through to mid-5th c. AD African red slip repertoire (Hayes 1972:236–237). Closed forms are documented by only one small vessel, possibly a table flask.

The repertoire of SCT table vessels is further enriched by the forms in Color-coated ware. Compared to that of regional fine ware, the repertoire of Color-coated ware reveals an even more articulated range of functional open vessels which introduces a series of new forms such as a large and deep basin (Fig. 5.24.9), possibly deriving from an original rethinking of the prototypes Hayes 67 and Hayes 68, two tiny sauce-bowls (Fig. 5.24.10–11), and finally an hemispheric grooved bowl (Fig. 5.24.13). Also of interest is the larger number of closed vessels represented by large table jars and handled table jugs (Fig. 5.24.12). On the other hand, the very variegated series of large bowls and dishes imitating the ARS prototypes Hayes 61 with variants A/B3 and A/B4 (Fig. 5.24.6–8) unites Color-coated ware and *sigillata chiara tarda dell'Italia centro-settentrionale*. Interestingly, one fragment of Color-coated ware which imitates the ARS Hayes 61 type is overfired and has firing defects represented by bubbles below the rim; it

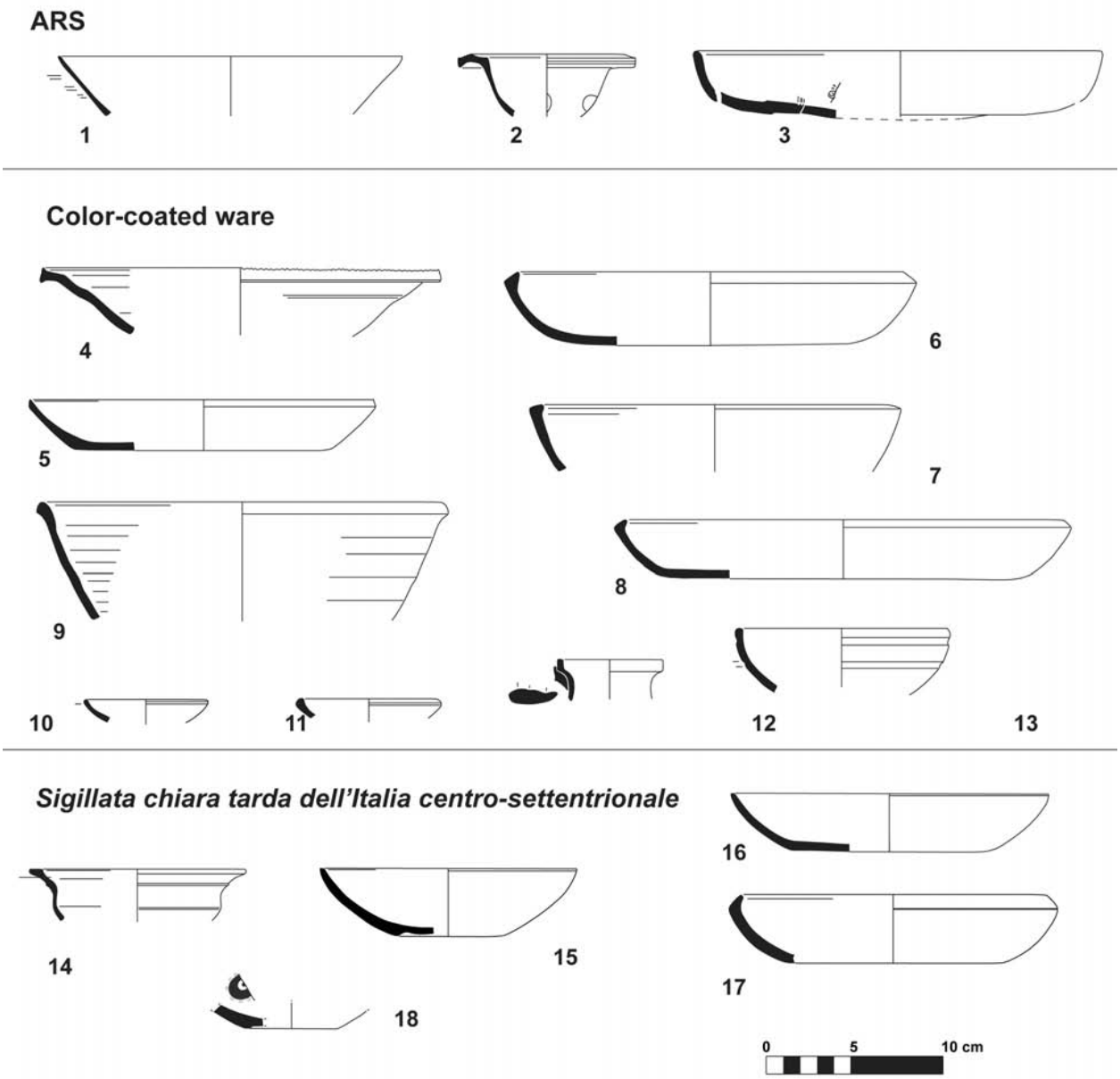


Fig. 5.24 Case Nuove, representative diagnostic ceramics from Phase 2, the late Roman square pit (SU 5022, 5023, 5027, 5035, 5044). Fine wares and Color-coated ware. ARS: 1. Hayes 50B; 2. Hayes 71B; 3. Hayes 64. Color-coated ware: 4. Flat-based dish imitating ARS Hayes 67; 5. Flat-based dish imitating ARS Hayes 50B; 6–8. Flat-based dishes imitating ARS Hayes 61; 9. Deep basin; 10–11. Small sauce-bowls; 12. Jug; 13. Bowl. SCT: 14. Bowl; 15–16. Flat-based dishes imitating ARS Hayes 50B; 17. Flat-based dish imitating ARS Hayes 61; 18. Dark-red color overpainted small bowl (EV).

may reveal that it was produced not too far from the site, unless we assume that damaged products were the object of a wide circulation. Also similar to some forms documented in the repertoire of regional fine ware is the flat based dish with pointed and oblique lip, which imitates the type Hayes 50B (Fig. 5.24.5). Of actual African red slip ware (4.16%) were only 3 MNI including a Hayes 50B dish, a dish/bowl Hayes 64, and a Hayes 71B bowl (Fig. 5.24.1–3).

Kitchen wares increase in this phase to 37.5% and, as in the late Republican phase, the preponderance of cooking pots (and lids) is overwhelming compared

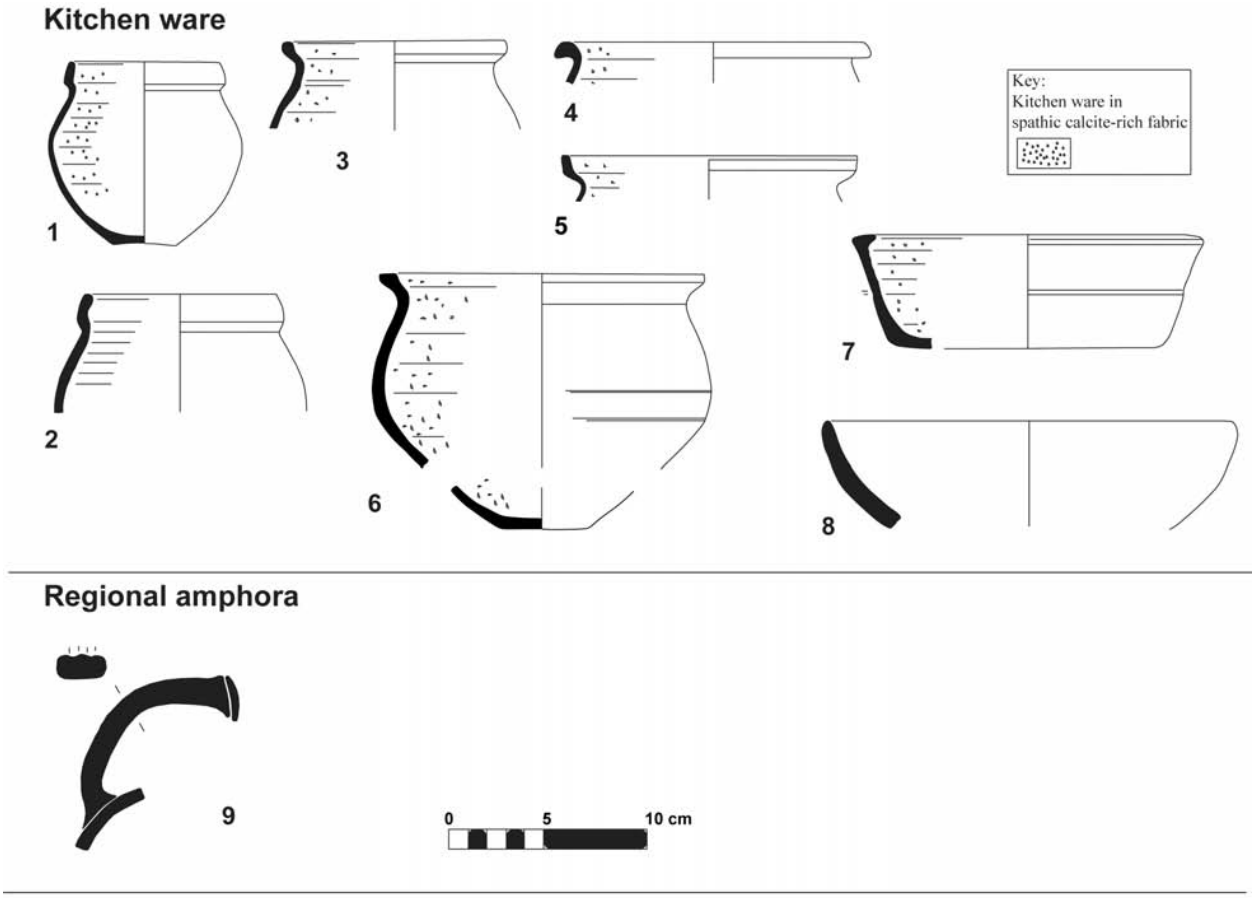


Fig. 5.25 Case Nuove, representative diagnostic ceramics from Phase 2, the late Roman square pit (SU 5022, 5023, 5027, 5035, 5044). Kitchen wares and regional amphora. Kitchen ware: 1–6. Cooking pots; 7. Casserole; 8. Baking pan/*tegame*. 9. Regional amphora (EV).

to open forms. The latter include a casserole (Fig. 5.25.7), two cooking dishes/*tegami* (Fig. 5.25.8), and one cooking dish/*testo*. Five lids in kitchen ware, according to their size, may be referred to cooking pots rather than open vessels. A closer analysis of the pots (Fig. 5.25.1, 3, 4–7) reveals a predominance of cooking pots tempered with spatic calcite—also seen previously in the Phase 1.1 cooking wares. Interestingly about 55% of the cooking pots from late Roman Case Nuove are calcite-tempered whereas only 24% of the cooking pots from the late Roman peasant site at Pievina present this technological feature.

Overseas amphorae are documented only by Tunisian and Portuguese examples, while regional imports are represented by an Empoli type (Fig. 5.25.9).[7] The Empoli amphora type circulated intensively along the central Tyrrhenian routes, but was rarely redistributed to nearby coastal sites, and even more rarely further inland (Vaccaro 2011:59, 83–84, 141–143).

Tableware forms (some 61% of the assemblage) are now marked by a complete dominance of open forms, including dishes both in SCT and African red slip (23. 61), bowls (15.27%) and coarse ware basins (6.94%). A handful of jars (2.77%) and jug/jars (6.94%) all in coarse ware have replaced the jugs of the late Republican phases, but these closed forms are far less prevalent than in the earlier phases of the site.

5.8 Faunal Materials (MM)

Phase 1.1: The faunal evidence for this period was limited, and the conclusions from it more restricted (Tables 5.4–5.7). The small dump of late

Table 5.4 Case Nuove, faunal remains, NISP and MNI values by temporal phase (MM).

	Case Nuove Phase 1.1			Case Nuove Phase 1.2			Case Nuove Phase 1.3			Case Nuove Phase 2			Case Nuove Phase 3		
	NISP	MNI	Wt. (g)	NISP	MNI	Wt. (g)	NISP	MNI	Wt. (g)	NISP	MNI	Wt. (g)	NISP	MNI	Wt. (g)
Cattle (*Bos taurus*)	7	1 (a)	229	—	—	—	—	—	—	32	3 (2s, 1a)	1091	—	—	—
Sheep/goat (*Ovis aries*/ *Capra hircus*)	3	1 (s)	5	25	3 (1j, 1s, 1a)	146	1	1 (s)	29	80	6 (1j, 1s, 4a)	540	8	2 (1j, 1s)	21
Pig (*Sus scrofa* dom.)	4	1 (a)	49	48	3 (1j, 2s)	313	4	2 (1j, 1s)	45	62	5 (2j, 3s)	225	12	2 (1j, 1s)	120
Dog (*Canis familiaris*)	—	—	—	—	—	—	—	—	—	8	2 (1j, 1a)	48	213	4 (2j, 2s)	2003
Domestic fowl (*Gallus gallus*)	—	—	—	35	5 (1j, 2s, 2a)	38	14	2 (2a)	30	20	4 (1j, 1s, 2a)	26	1	1 (a)	1
Red deer (*Cervus elaphus*)	1	1 (a)	3	—	—	—	1	1 (a)	50	13	1 (a)	416	1	1 (a)	5
Roe deer (*Capreolus capreolus*)	—	—	—	—	—	—	—	—	—	—	—	—	1	1 (a)	57
Hare (*Lepus europaeus*)	—	—	—	—	—	—	—	—	—	—	—	—	69	6 (5j, 1s)	167
Badger (*Meles meles*)	—	—	—	—	—	—	—	—	—	1	1 (a)	2	—	—	—
Weasel (*Mustela* sp.)	—	—	—	—	—	—	—	—	—	1	1 (a)	1	—	—	—
Song thrush (*Turdus* sp.)	—	—	—	3	1	3	—	—	—	—	—	—	—	—	—
Pheasant/ galliform bird?	—	—	—	2	1	2	—	—	—	—	—	—	—	—	—
Tortoise (*Testudo* sp.)	—	—	—	—	—	2	—	—	—	3	1	90	—	—	—
Vole (*Microtus* sp.)	—	—	—	4		2	7		2	—		—	22		8
Black rat (*Rattus rattus*)	—	—	—	17		9	6		2	—		—	5		4
Frog/toad	—	—	—	—	—	—	29		5	—		—	20		5
Lizard	—	—	—	—	—	—	3		1	—		—	24		6
Land snail	—	—	—	8		2	—		—	9		2	—		—
TOTAL	**15**	**4**	**286**	**142**	**13**	**517**	**65**	**6**	**164**	**229**	**23**	**2441**	**376**	**17**	**2397**

a = adult; s = subadult; j = juvenile

Republican date yielded only 15 NISP of remains: 7 cattle, 3 sheep/goat, 4 pig, 1 red deer (Table 5.4) Nevertheless, the presence of all three of the chief domestic mammals (cattle, ovicaprids, and pigs) suggests a mixed husbandry and dietary scheme, presumably something akin to typical, small-to-medium scale practices in animal management and use for late Republican central Italy as a whole. A somewhat balanced collection of bones from various parts of the skeleton, as inferred from UNID counts, moreover, suggests relatively local herding, processing, and consumption (Table 5.5). Thus, there is no indication of large-scale, or highly specialized husbandry operations during the 1st century BC period.

Phase 1.2: The faunal material witnessed significant changes from Phase 1.1 and was dominated by bones and teeth of ovicaprids, pigs, and domestic fowl. Pigs account for nearly twice as many as ovicaprids (NISP), but each taxon records an MNI count of three (Table 5.4 and 5.7). Domestic fowl are quite plentiful, at 35 NISP and 5 MNI. Younger animals, across all three taxa (pigs, ovicaprids, and domestic fowl), are well represented. About 30% of the ovicaprids are under one year of age; 100% are under two years of age. For pigs, the majority of individuals are less than one year of age. Although all parts of the skeleton are represented and in fairly equal proportions, there is a slight bias in favor of elements associated with primary cuts of meat for ovicaprids and pigs (Table 5.4).

Relatively few of the bones from the tank exhibit traces of butchery, possibly a result of young, tender animals easily pulled apart at the joints, or more easily disarticulated and cut into portions using knives and other instruments that might leave fewer marks on the bones. A lack of charring, moreover, suggests that roasting and grilling were not preferred methods of cooking. Boiled meat, incorporated in a stew or similar manner may have been the most common method of cooking, and the presence of some long-bone fragments with spiral fracturing, a pattern generally indicative of breaking the bones prior to boiling, supports this. Note this is somewhat at odds with the kitchen wares data which point to a decrease in closed forms used for boiling/stewing.

The marked abundance of younger animals, including young domestic fowl, is significant and stands in contrast to contemporary deposits from the site of Pievina where older animals predominated (see Ch. 4). A somewhat wealthier or more privileged diet is suggested at this phase of Case Nuove, one where younger animals, particularly choice domestic meat animals such as lamb, kids, piglets, and younger domestic fowl, as well as a larger proportion of better-quality primary meat cuts from these animals, formed a central component of the diet. Dietary wealth in Roman times can also commonly be achieved through the addition of game meats and other luxury products. The song thrush and pheasant bones noted in the Casa Nuove assemblage might derive from hunted or trapped birds, although bones of other wild game are absent.

Phase 1.3: Relative to the previous phase and to the excavated area of the cistern, the faunal sample was rather small (65 NISP/6 MNI) and mostly from medium-sized (i.e., dog, sheep/goat, and pig-sized) mammals (see Table 5.4). The presence of younger pig, ovicaprid, and domestic fowl bones echoes patterns shown for the Phase 1.2 contexts—that is, the materials in each probably relate to food waste, perhaps from a more elite diet.

Phase 2: Similar to contexts from earlier periods, the faunal remains were dominated by pigs, ovicaprids, and domestic fowl (Table 5.4). Cattle, a taxon absent from earlier dietary deposits at the site, now registers, accounting for about 20% of the principle consumable domesticates by NISP and MNI tallies. As with other contexts, younger animals are notably common, especially younger pigs and domestic fowl, although immature ovicaprids and cattle are also represented and in numbers that suggest their contribution to diet as opposed to simply rearing these taxa to older ages to exploit their secondary resources (i.e., wool, traction, etc.). The presence of remains of fetal and newborn pigs reinforces a local origin of these animals. Consumable wild animals, often a sign of an elite diet, are relatively more abundant here than among other contexts. Red deer, represented by a number of butchered leg bones, account for about 5% of the NISP figures represented in this context.

Phase 3: Faunal materials were the only materials found in these medieval fill levels from the well. Bones from consumed domestic animals, presumably materials that accumulated as food waste, include pigs, ovicaprids, and domestic fowl: cattle are absent. Each taxon is normally represented by a mix of elements from the entire skeleton, suggesting local processing and consumption, as opposed to any import or export of parts. Younger individuals preponderate, which

Table 5.5 Case Nuove, faunal remains, UNID counts by temporal phase (MM).

	Case Nuove Phase 1.1		Case Nuove Phase 1.2		Case Nuove Phase 1.3		Case Nuove Phase 2		Case Nuove Phase 3	
	Count	Weight (g)	Count	Weight (g)	Count	Weight (g)	Count	Weight (g)	Count	Weight (g)
MAMMAL										
SMALL										
Rib	—	—	8	2	—	—	2	2	—	—
Long bone	—	—	7	3	—	—	1	1	—	—
Vertebrae	—	—	—	—	—	—	3	2	—	—
Other	—	—	a	—	b	—	1	1	b	—
MEDIUM										
Rib	7	12	112	160	3	20	66	89	1	6
Long bone	22	36	101	139	3	17	159	377	3	17
Vertebrae	8	45	26	74	—	—	19	53	—	—
Scapula/Pelvis	3	11	15	34	1	1	6	16	1	1
Cranium	1	5	14	16	—	—	3	12	—	—
Other	—	—	1	2	—	—	11	14	c	—
LARGE										
Rib	13	84	4	55	1	10	—	—	1	6
Long bone	13	392	1	25	1	8	12	191	3	30
Vertebrae	1	39	1	28	—	—	2	11	—	—
Scapula/Pelvis	2	10	—	—	—	—	—	—	—	—
Cranium	1	8	—	—	—	—	15	58	—	—
Other	1	14	—	—	—	—	1	9	—	—
AVIAN	—	—	**41**	**13**	—	—	**20**	**9**	—	—
TOTAL	**72**	**565**	**331**	**551**	**9**	**56**	**321**	**845**	**9**	

a = misc. rodent scraps b = misc. rodent and lizard scraps c = misc. dog scraps

Table 5.6 Case Nuove, faunal remains, % NISP and MNI values by temporal phase for principal domestic meat taxa (MM).

	Case Nuove Phase 1.1		Case Nuove Phase 1.2		Case Nuove Phase 1.3		Case Nuove Phase 2		Case Nuove Phase 3	
	NISP (n=14)	MNI (n=3)	NISP (n=73)	MNI (n=6)	NISP (n=5)	MNI (n=3)	NISP (n=174)	MNI (n=14)	NISP (n=20)	MNI (n=4)
Cattle (*Bos taurus*)	50	33.3	—	—	—	—	18.5	21.4	—	—
Sheep/goat (*Ovis aries/ Capra hircus*)	21.4	33.3	34.2	50	20	33.3	45.9	42.9	40	50
Pig (*Sus scrofa* dom.)	28.6	33.3	65.8	50	80	66.7	35.5	35.7	60	50

Table 5.7 Case Nuove, faunal remains, NISP and MNE frequency of skeletal part categories for sheep/goat and pig for Phase 1.2 (MM).

	Cattle				Sheep/Goat				Pig			
	1°	2°	ext.	head	1°	2°	ext.	head	1°	2°	ext.	head
NISP	3.1	6.3	—	90.6	5.2	19.5	9.1	66.2	9.7	11.3	8.1	71
MNE	20	10	—	60	16.7	25	16.7	41.7	18.2	18.2	18.2	45.5

Sample sizes for Phase 1.2:
cattle: NISP=32; MNE=5
sheep/goat: NISP=77; MNE=12
pig: NISP=62: MNE=11

1° = primary cut (includes scapula, humerus, pelvis, femur)
2° = secondary cut (includes radius, ulna, tibia, fibula)
ext. = limb extremities (includes metapodials, carpals, tarsals, phalanges)
head = cranium, mandible, all teeth

generally implies a wealthier diet, and indirectly may also suggest a measure of localized breeding exploitation of livestock. Wild animals are rare.

What sets the well assemblage apart other faunal contexts at Case Nuove is the presence of nearly complete skeletons of at least 4 dogs and 6 hares (see Tables 5.4 and 5.5). None of these taxa show any traces of butchery, in turn suggesting that they were not consumed. The abundance of hare bones in relation to the number of elements from consumable domesticates (i.e., over 69 hare bones to a combined total of 21 pig, ovicaprid, and domestic fowl bones), further implies that these hares were probably not eaten, and it is unlikely that the dogs were consumed either.

How then did these dogs and hares get into the well? One possibility is that they fell in. The hares recovered all derive from younger animals, under a few months of age. Such immature hares might be more susceptible to accidents or falls as they scampered around the territory. In the case of the dogs, however, the bulk represents mature specimens, older than 18 months (and probably older than two years), on the basis of fused vertebral epiphyses. Size estimates of these dogs, derived from available long bone measurements, indicate that two individuals were approximately 52–54 cm in height (at the withers), with a third dog between 46–49 cm in height. Although extrapolating the breed of dog from these measurements is problematic, these figures fit best with medium-sized types, comparable in scale to the modern Labrador or similar. Two of these dogs may have even been from the same litter, given the nearly identical fusion states and size correlations. None of the dogs displayed any osteological pathological conditions and appear to have been in good health, nor do the bones display any perimortem fracturing that might result from a fall into the well. While the age, breed, and apparent good health of these dogs need not restrict a scenario where any or all accidentally fell into the well, one cannot rule out another option, namely that dogs were deliberately discarded in the well through human agents.

5.9 Botanical Materials (AAM, ER, RR)

Seventeen pollen samples were collected, nine from two contexts (SU 5033 [P1–4], 5044 [P5–9]) within the late antique square cut), and six from both the fill and the cut of the circular press base (SU 5051 [P12, 14–15] and 5052 [P10–11, 13]) (Table 5.8). All the archaeological contexts sampled for pollen were from Phase 2. Macroremains were collected from five contexts, the fill of the tank (SU 5014, Phase 1.2), the fill of the cistern (5048, Phase 1.3), the lowest level reached in the well (SU 5050, medieval) and two contexts within the square cut (5023 and 5044, Phase 2). The two samples taken from the natural levels adjacent to the site (P16–17) were sterile and not reported here. The pollen and macroremain records overlapped for Phase 2, while only macroremain data documented Phases 1.2–2. Macrocharcoal analysis was carried out only on materials from the Phase 2 square pit fills.

Pollen was found in 15 samples, while the two samples from SU 5013 were sterile (P16, P17). A total of 7,563 pollen grains (ca. 500 p/sample), 2,151 NPPs, 1,552 microcharcoals, and 722 seeds/fruits were

counted. Concentration was variable, ranging from ca. 900 p/g (in P12) to 37,170 p/g (in P1). In the square pit (SU 5033, 5044; samples P1–P9), concentrations were particularly high (ca. 13,870 p/g on average) and in general were compatible with some plant accumulation in place (particularly in samples P1, and P7 to P9 with concentrations $>10^5$ p/g). Pollen grains were generally found in a fairly good state of preservation. Only in sample P9 (bottom of the square pit), a very few reworked pollen grains (ca. 1.5%) were observed, indicating the influx of 'old' pollen or that with a rearranged exine, carried from other places.

Landscape and woodland composition: Species diversity was relatively high, from 38 to 48 pollen taxa per sample, corresponding to a fairly diverse environment. The Arboreal/Non Arboreal pollen ratio (AP/NAP) was 14/86, suggesting that herb cover was dominant in the landscape while trees and shrubs were sparse. In the pollen spectra, only three woody plants reach mean values >1%: the deciduous oaks *Quercus* (4.5%, on average) that probably were the main elements of woodlands; the shrubs of Mediterranean woodlands *Erica arborea* cf. (2.7%); and *Pinus* (1.5%). The dominance of *Quercus* is also suggested by their exclusive presence among the macrocharcoals. The low percentages of these plants suggest that trees/shrubs were located fairly far from the site, and possibly a puzzle of woody and shrubby/open areas were fairly common in the surrounding areas. Two sets of evidence suggest that these open areas were also maintained by fires: the presence of *Erica arborea* and *Helianthemum*, and the microcharcoals that are common in samples (see below). According to this interpretation, the *Alnus* trees in the spectrum may have been used for reclaiming of poor soils and burned areas.

Wet environments: Indicators for hygrophilous woodlands dominated by *Alnus* and *Salix* were found in low quantities (1.8%). A few helophytes (*Phragmites australis* cf., *Typha latifolia* type; 1.0%) growing along the riverbanks or freshwater ponds, and hydrophytes (0.8%), i.e., plants floating in water, were also found. These probably derive from the springs which are typical of this area (see below).

Cereal fields: Among herbaceous plants, cereals were the most significant, representing some 4.5% of the pollen samples on average (3.5% in the square pit, and 6.0% in the cut for the press base). Species found in both pollen and macroremains include *Avena*/*Triticum* group (*Triticum aestivum*, *T. monococcum*, and *T. dicoccum* were found SU 5023, and *T. durum* in 5014); *Hordeum* group (cultivated barley and some wild species); *Secale* (rye), and undifferentiated Cerealia (folded-crumpled, not well identifiable pollen grains of cereals). Cerealia pollen percentage is actually relatively high because these grains are known to be underrepresented in pollen rain and diminish rapidly from point of origin (Booth and Richards 1978; Behre 1986; Hall 1989; Ravazzi et al. 2004; Dreßler et al. 2006). Cereal fields were likely located in the vicinity of the site in late antiquity.

Other, secondary indicators support such a reconstruction. Weeds of cereal fields are represented by seeds of *Agrostemma githago*, by pollen of *Aphanes/Alchemilla* type, possibly also by those of *Cuscuta europaea* and *Convolvulus*, while *Rubus* easily grows at the edges of fields.

The composition of cereals itself deserves comment. The variety present in most of the Phase 2 contexts points to a mixed cereal-producing regime, with wheat species alternating or being grown alongside more drought-resistant types like barley. The combined presence of cereals and legumes (cf. *Pisum arvensis* [SU 5044], *Lens culinaris* [SU 5014, 5023, 5044]) in some contexts may likewise point to crop rotation for the replenishment of soil nutrients. Moreover, Poaceae-wild group, commonly found in grasslands, includes both wild grasses and those cultivated for fodder together with Fabaceae (*Dorycnium*, *Hedysarum, Lotus, Trifolium*). Likewise, Poaceae-wild group, together with *Trifolium arvense*, *T. campestre*, and *T.* sp. were found among macroremains (see below). Cereal fields may have been rotated in subsequent years with cultivations of fodder plants.

Cultivated woody plants: Percentages of cultivated trees are relatively low, in sharp distinction from the oleo-viticulture that dominates the landscape today. Pollen from these trees was found only in the Phase 2 square pit and included traces of *Olea, Vitis*, and *Castanea*. The concomitant olive groves and chestnut woods would thus have been far enough from the site that their pollen grains were not a common part of the local pollen rain. Some exception may be made for vineyards, as the absence or low amount of this pollen in archaeological sites is common, possibly a by-product of low-pollen production itself caused by the hermaphroditic self-pollination assisted by entomophilous and anemophilous

Table 5.8 Case Nuove, pollen analysis (AMM/ER).

CASE **NUOVE (Phase 2) Percentage pollen spectra**																		
Sample (CN)			***P1***	***P2***	***P3***	***P4***	***P5***	***P6***	***P7***	***P8***	***P9***	***P10***	***P11***	***P12***	***P13***	***P14***	***P15***	***Mean pollen spectrum***
Stratigraphic Unit			5033				5044					5052		5051	5052	5051		
Pollen concentration (p/g)			**37172**	**5980**	**7417**	**5478**	**2049**	**8282**	**16153**	**12250**	**30009**	**5197**	**1271**	**903**	**1418**	**3177**	**1943**	**9247**
BETULACEAE	*Alnus* cf. *incana*	Wt	1.9	1.0	0.2				1.1	0.4	0.2	1.7	0.4			1.2		0.5
	Alnus cf. *glutinosa*	Wt	1.6				0.4	0.2				0.2						0.2
	Alnus indiff.	Wt	0.2		1.3	1.1	0.4	0.7	1.5	0.7	1.0	1.3	1.4	0.4	0.2	1.6	0.2	0.8
	Carpinus betulus	Ow		0.4														0.03
	Corylus	Ow	0.2	0.8	0.2	0.2	0.4	0.2	1.5		1.0			1.7			0.4	0.4
	Ostrya/Carpinus orientalis	Ow			0.4	0.4					0.4	0.2		2.1	0.2		0.4	0.3
CANNABACEAE	*Celtis*		0.2															0.01
CISTACEAE	*Helianthemum*		2.5				1.2	0.4	0.4			3.4	0.2	2.1		1.6	0.6	0.8
	Cistus		1.9		0.4			0.4				0.7	0.2	1.7	0.4	0.6	0.4	0.4
CUPRESSACEAE	*Juniperus* type	Md										0.2	0.4	0.8				0.1
EPHEDRACEAE	*Ephedra fragilis* type														0.2			0.01
ERICACEAE	*Erica arborea* cf.	Md	4.7	2.8	1.3	4.0	4.2	1.8	1.1	2.6	2.1	3.2	2.3	0.8	5.2	2.0	2.1	2.7
FAGACEAE	*Castanea sativa*										0.2							0.01
	Fagus							0.4						0.4				0.1
	Quercus deciduous	Ow	4.7	4.4	5.6	3.4	6.0	5.9	3.6	3.6	5.0	4.3	5.4	1.3	8.5	1.6	4.2	4.5
MALVACEAE	*Tilia* (incl. *T.* cf. *tomentosa*)	Ow			0.2	0.4					0.2							0.1
MYRTACEAE	*Myrtus*	Md					0.2											0.01
OLEACEAE	*Fraxinus* cf. *angustifolia*	Ow			0.2													0.01
	F. ornus type	Ow		0.8								0.6	0.6	0.4		0.4	0.4	0.2
	Olea europaea	Md		1.0		0.4		0.2		0.2								0.1
	Oleaceae indiff.		0.2	0.4								0.2						0.1
PINACEAE	*Abies*				0.2		0.4			0.2		0.4				0.4	0.8	0.2
	Picea								0.4							0.2		0.04
	Pinus		1.2	1.8	2.6	1.3	2.3	0.5		1.1	0.8	3.7	1.0	1.7	0.8	1.4	2.7	1.5
ROSACEAE	*Prunus*			0.6		0.6	0.2						0.4		0.4			0.1
	Rubus type							0.2										0.01

Table 5.8 cont'd Case Nuove, pollen analysis (AMM/ER).

CASE **NUOVE (Phase 2) Percentage pollen spectra**																		
Sample (CN)			***P1***	***P2***	***P3***	***P4***	***P5***	***P6***	***P7***	***P8***	***P9***	***P10***	***P11***	***P12***	***P13***	***P14***	***P15***	***Mean pollen spectrum***
Stratigraphic Unit			5033				5044					5052		5051	5052	5051		
Pollen concentration (p/g)			**37172**	**5980**	**7417**	**5478**	**2049**	**8282**	**16153**	**12250**	**30009**	**5197**	**1271**	**903**	**1418**	**3177**	**1943**	**9247**
	Sorbus					0.8											0.6	0.1
SALICACEAE	*Salix*	Wt	0.4		0.8	0.2		0.2	0.6					0.4		0.8	0.6	0.3
	Populus	Wt											0.2					0.01
VITACEAE	*Vitis*						0.2		0.2									0.03
ALISMATACEAE	*Sagittaria*	Wh			0.9	0.4			0.6	0.2		2.2	1.4	0.8	0.6	0.6	0.6	0.6
AMARANTHACEAE	*Chenopodium*		3.3		0.2	0.4	0.6	0.2	0.2	1.3		0.2	0.8	0.8	0.4	1.2	2.3	0.8
APIACEAE	Apiaceae indiff.		1.4			0.2	0.6	0.7	0.2	0.4	0.8	0.2	0.8		0.8	1.0	0.4	0.5
	Daucus type														0.6			0.04
	Heracleum cf.	LPPI									0.2							0.01
ASTERACEAE	*Ambrosia*			1.0		0.2		0.2		0.4								0.1
	Artemisia		1.2	0.8	1.1	0.2	1.2	0.7		0.7	0.2	2.0	1.2	0.4		1.2		0.7
	Aster type	LPPI	3.7	2.0	3.0	1.5	3.5	4.1	4.0	2.6	2.3	3.7	3.3	1.3	2.5	3.8	5.2	3.1
	Centaurea nigra type	LPPI	4.8	0.8	0.4		1.4	1.3	2.8	3.4	3.6	3.5	1.7	2.5	1.4	2.0	1.5	2.1
	Cichorieae	LPPI	17.2	38.4	30.2	52.0	43.1	41.1	39.5	49.2	39.3	24.2	23.6	30.0	25.0	26.6	26.5	33.7
	Matricaria type	LPPI	1.9		0.2	0.2		0.5				0.9	0.4	0.4				0.3
BRASSICACEAE	*Brassica type*				3.4	0.2				3.4	1.1	1.9					1.0	0.7
	Brassicaceae indiff.		2.3	1.8	1.9	2.9	2.5	4.3	4.7	5.8	8.2	1.7	6.0	4.2	3.5	3.8	1.9	3.7
	Hornungia type				0.2	0.4												0.04
CARYOPHYLLACEAE	Caryophyllaceae indiff.		3.3		2.8	1.0	0.8	2.0	2.1	1.7		3.7	1.0		1.9	1.6	4.4	1.7
	Paronychia type						0.2											0.01
CONVULVULACEAE	*Convolvulus*				0.2													0.01
	Cuscuta europaea							0.2										0.01
CYPERACEAE	Cyperaceae	(Wh)	5.0	1.2	1.5	1.1	0.4	2.3	1.1	0.6	1.5	2.8	3.5	4.6	1.6	0.6	1.3	1.9
EUPHORBIACEAE	Euphorbiaceae		0.8						0.2			0.4	1.0	2.5	1.2			0.4

Table 5.8 cont'd Case Nuove, pollen analysis (AMM/ER).

CASE **NUOVE (Phase 2) Percentage pollen spectra**																		
Sample (CN)			***P1***	***P2***	***P3***	***P4***	***P5***	***P6***	***P7***	***P8***	***P9***	***P10***	***P11***	***P12***	***P13***	***P14***	***P15***	***Mean pollen spectrum***
Stratigraphic Unit			5033				5044					5052		5051	5052	5051		
Pollen concentration (p/g)			**37172**	**5980**	**7417**	**5478**	**2049**	**8282**	**16153**	**12250**	**30009**	**5197**	**1271**	**903**	**1418**	**3177**	**1943**	**9247**
FABACEAE	*Dorycnium*	le		0.6	0.2	0.8	1.5	0.2	0.8	0.2	0.6	0.9	0.6		1.4	1.0		0.6
	Fabaceae indiff.	le	2.5	2.8	3.9	1.7	1.7	2.3	3.8	1.7	2.7	1.3	2.3	2.9	1.4	2.8	0.2	2.3
	Hedysarum	le					0.2	0.4			0.2					0.2		0.1
	Lotus	le						0.2	0.2		0.8		0.4					0.1
	Trifolium	le	2.3	1.2	2.3	0.6	0.6	1.4	3.4	2.1	2.5	1.9	0.6	2.1	0.6		0.6	1.5
HYDROCHARITACEAE	*Hydrocharis*	Wh						0.2		0.2								0.02
HYPERICACEAE	*Hypericum*							0.2		0.6								0.05
LAMIACEAE	Lamiaceae indiff.		3.3	3.0	0.9	0.8	0.6	0.2	0.6			2.2	2.5		1.2	0.8	0.4	1.1
	Mentha type		0.2			0.2	1.4								2.5	1.6	1.0	0.5
	Stachys type						0.2											0.01
LILIACEAE	Liliaceae		2.7		1.1		0.2	0.2	0.6	1.5	0.4				0.4	3.0	0.8	0.7
NYMPHAEACEAE	*Nymphaea alba*	Wh								0.4			0.6	0.4			0.4	0.1
	Nuphar	Wh		0.2					0.2				0.4					0.1
PLANTAGINACEAE	*Plantago*			1.0	0.6	0.8		0.4	0.6		0.8	0.2	1.5	0.8	2.3	0.8	1.9	0.8
POACEAE	*Avena/Triticum* group	ce		1.8	0.6		1.2	1.3	0.9	0.2	0.2	1.9	1.4	3.0	0.6	0.8	4.4	1.2
	Hordeum group	ce	1.6	0.6	0.6	0.8	0.4	2.2	0.2	0.4	2.1	0.7	1.0	0.8	1.2	0.8	1.7	1.0
	Secale	ce										0.4		0.8	0.2			0.1
	Cerealia indiff.	ce	2.5	3.0	1.5	0.8	1.0	2.5	2.5	2.6	0.6	3.5	3.1	1.3	1.9	2.8	4.0	2.2
	Phragmites australis cf.	Wh	0.2		0.2	1.0	0.4	0.4		0.6		0.4	0.4	0.4		1.4	0.6	0.4
	Poaceae-wild group		9.9	14.0	19.7	13.9	13.7	14.5	13.1	6.5	12.6	14.9	23.2	21.7	22.7	21.8	19.6	16.1
POLYGONACEAE	*Polygonum persicaria* type								0.6	0.2								0.1
POTAMOGETONACEAE	*Potamogeton*	Wh			0.2			0.2			0.6							0.1
PRIMULACEAE	*Anagallis*		0.6						0.4									0.1
RANUNCULACEAE	*Helleborus*					0.2												0.01
	Ranunculus type	LPPl	1.6	1.2	1.7	0.6		2.2		0.4	2.3	0.2			2.5		3.1	0.1
	Ranunculaceae indiff.	LPPl	0.4	0.8	0.8		2.3		3.2	1.5	2.5		1.5			1.2		0.9

Table 5.8 cont'd Case Nuove, pollen analysis (AMM/ER).

CASE **NUOVE (Phase 2) Percentage pollen spectra**																	
Sample (CN)			***P1***	***P2***	***P3***	***P4***	***P5***	***P6***	***P7***	***P8***	***P9***	***P10***	***P11***	***P12***	***P13***	***P14***	***P15***	***Mean pollen spectrum***
Stratigraphic Unit			5033				5044					5052		5051	5052	5051		
Pollen concentration (p/g)			**37172**	**5980**	**7417**	**5478**	**2049**	**8282**	**16153**	**12250**	**30009**	**5197**	**1271**	**903**	**1418**	**3177**	**1943**	**9247**
ROSACEAE	*Aphanes/Alchemilla* type			1.6														0.1
	Filipendula			1.0	1.5		0.2											0.2
	Potentilla type	LPPI		2.0														0.1
	Rosaceae indiff.		2.3	1.0	2.6	1.1	1.7	0.7	2.1	0.6	1.3	1.9	1.0	1.3	3.5	2.0	0.4	1.6
SAXIFRAGACEAE	*Saxifraga* cf.		1.0				0.4	0.2										0.1
SCROPHULARIACEAE	Scrophulariaceae						0.8											0.1
SOLANACEAE	*Solanum nigrum* type					0.8	0.2							0.4				0.1
TYPHACEAE	*Typha latifolia* type	Wh	0.6	0.6	1.1	0.2						0.7	1.0	0.4	1.9	0.6	1.2	0.6
URTICACEAE	*Urtica dioica* type		1.4	1.2		0.2			0.2	0.2		1.1	1.4	1.3	0.2	1.6	0.6	0.6
	Urtica cf. *pilulifera*		1.4			0.4				0.2	0.4	0.2		0.8		1.8		0.3
VIOLACEAE	*Viola*		1.0															0.1
Unknown/Indet.			0.2	2.4	1.3	2.1	1.5	1.8	0.9	1.9	1.5	0.1	0.4	0.3	0.4	0.8	0.8	1.1
POLLEN SUM			**516**	**550**	**533**	**525**	**518**	**557**	**527**	**535**	**522**	**537**	**517**	**240**	**516**	**500**	**520**	**504**
NUMBER OF TAXA			**44**	**40**	**48**	**47**	**43**	**48**	**39**	**41**	**38**	**46**	**43**	**41**	**38**	**41**	**43**	
SUMS																		
Arboreal pollen		AP	**19.6**	**14.0**	**13.3**	**12.8**	**15.8**	**11.0**	**10.4**	**8.8**	**10.7**	**19.9**	**12.4**	**13.8**	**15.9**	**11.8**	**13.3**	**13.6**
Non Arboreal pollen		NAP	**80.4**	**86.0**	**86.7**	**87.2**	**84.1**	**89.1**	**89.6**	**91.2**	**89.3**	**80.0**	**87.6**	**86.2**	**84.1**	**88.2**	**86.7**	**86.4**
Mixed oak wood		Ow	**4.9**	**6.4**	**6.6**	**4.4**	**6.4**	**6.1**	**5.1**	**3.6**	**6.5**	**5.0**	**6.0**	**5.4**	**8.7**	**2.0**	**5.4**	**5.5**
Mediterranean trees/shrubs		Md	**4.7**	**3.8**	**1.3**	**4.4**	**4.4**	**2.0**	**1.1**	**2.8**	**2.1**	**3.4**	**2.7**	**1.7**	**5.2**	**2.0**	**2.1**	**2.9**
Wet environments (trees)		Wt	4.1	1.0	2.3	1.3	0.8	1.1	3.2	1.1	1.1	3.2	1.9	0.8	0.2	3.6	0.8	1.8
Wet environments (herbs)		Wh	0.8	0.8	2.4	1.5	0.4	0.7	0.8	1.3	0.6	3.4	3.7	2.1	2.5	2.6	2.7	1.7
Wet environments (Cyperaceae)		(Wh)	5.0	1.2	1.5	1.1	0.4	2.3	1.1	0.6	1.5	2.8	3.5	4.6	1.6	0.6	1.3	1.9
Wet environments		WE	**9.9**	**3.0**	**6.2**	**4.0**	**1.5**	**4.1**	**5.1**	**3.0**	**3.3**	**9.3**	**9.1**	**7.5**	**4.3**	**6.8**	**4.8**	**5.5**
Cerealia		ce	**4.1**	**5.4**	**2.6**	**1.5**	**2.5**	**5.9**	**3.6**	**3.2**	**2.9**	**6.5**	**5.4**	**5.8**	**3.9**	**4.4**	**10.2**	**4.5**
Legumes/pulses (-fodder)		le	**4.8**	**4.6**	**6.4**	**3.0**	**4.1**	**4.5**	**8.2**	**3.9**	**6.7**	**4.1**	**3.9**	**5.0**	**3.3**	**4.0**	**0.8**	**4.5**
LPPI (-Cich)			12.4	6.8	6.0	2.3	7.1	8.1	10.1	7.9	10.9	8.4	7.0	4.2	6.4	7.0	9.8	7.6
LPPI		LPPI	**29.7**	**45.2**	**36.2**	**54.3**	**50.2**	**49.2**	**49.5**	**57.0**	**50.2**	**32.6**	**30.6**	**34.2**	**31.4**	**33.6**	**36.3**	**41.3**

cross-pollination (Turner and Brown 2004; Mercuri et al. 2010). Despite the very low percentage <0.03% (it is only 0.2% in two samples from US5044), we cannot exclude the possibility of the nearby presence of some small vineyards.

Pastures and fodder: Pasture was a major part of the landscape around the site in late antiquity. At Case Nuove, LPPI measured 41% and included Asteroideae (including *Aster* type, *Centaurea nigra* type, *Matricaria* type) and Cichorieae (*Ranunculus* type and Ranunculaceae indiff., *Potentilla* type, *Heracleum* cf.). Cichorieae are pasture indicators reflecting animal breeding and grazing areas (Behre 1986), and, in these spectra, they are the main component of this category (34%).

Legumes and grasses such as pollen of *Dorycnium, Lotus, Trifolium*, and Fabaceae indiff., and also partly Poaceae-wild group, include species that may be cultivated for fodder. Other herbs are common in pastures or in abandoned fields that can be browsed (Apiaceae, Brassicaceae, and Caryophyllaceae).

Non-Pollen Palynomorphs

Fungi (11 morphotypes plus some undifferentiated spores) were moderately present, measuring 2,115 NPP/g on average) and included Glomeromycota (*Glomus*), Ascomycota (*Delitschia* type, *Gelasinospora,* Sordariaceae, *Sporormiella, Valsaria variospora* type, *Spegazzinia*, *Alternaria*), and Basidiomycota (*Puccinia, Tilletia*) Basidiomycota include parasites of plants, including cereals (Table 5.9). *Puccinia* was found in traces in P7, while *Tilletia* is common in these samples (absent only from P12). Ascomycota include a number of very important paleoecological coprophilous fungi, i.e., markers of herbivores and pastures. In fact, *Sporormiella* (only in P5 and P7) has species of obligate coprophilous fungi, occurring on dung of both domestic and wild herbivores. *Sordaria* type has similar ecological needs. Interestingly, it was found only in traces in the square pit (in P6) but was abundant and common in the dolium (P10–P15: 174 NPP/g, on average). *Gelasinospora*, a carbonicolous fungus, was found in P5, P8, and in three samples from the dolium (P13–P15). *Glomus*, found in almost all samples (absent only in P3), is indicative of soil erosion.

Algae (5 morphotypes) was present in low concentrations (172 NPP/g) and included *Pseudoschizaea* (or *Concentricystes*) a common and easy recognizable spore of algae (Zignemataceae; Grenfell 1995) that may reflect anthropogenic soil erosion or presence of fresh water, free in wet environments or collected in cisterns. This alga was found in all samples from the square pit (P1–P9) while it is absent in the dolium. On the contrary, the alga HdV181, which lives at the surface of water, is present only in the dolium (P10–P15; 26 NPP/g). The other algal remains are scattered in the samples.

Of parasite eggs (2 types of parasite eggs, and other undifferentiated records of invertebrate fragments) concentrations were likewise low (25 NPP/g) and consist of mammalian parasites: *Trichuris*, found in P1, P8, and P14, and *Dicrocoelium*, found in P2. *Trichuris* includes the species *T. trichiura* and *T. suis*, parasites of humans and pigs, respectively, and *T. vulpis,* a common dog parasite. Most human trichuriasis is caused by *T. trichiura*, while only adults of *T. vulpis* and *T. suis* can be found occasionally in the intestinal tract of humans (Florenzano et al. 2012). *Dicrocoelium* includes the species *D. dendriticum* (salmon tapeworm), a parasite of ruminants.

Microcharcoals (Table 5.9): Microscopic particles of charcoals >125 μm that are indicative of local fires, were found in all samples, except for P12. Their concentration was ca. 780 ch/g on average and was about four times higher in the square pit (ca. 1,100 ch/g) than in the dolium (ca. 300 ch/g). Moreover, in the square pit very large particles, <1,000 μm, were found in P1 and P3. In the dolium, large charcoal particles were only observed in P14.

Macrocharcoals (Table 5.10): Only various specimens of *Quercus* sp. were identified, all from the Phase 2 square pit.

Macroremains (Table 5.11): A significant quantity (722) of seeds and fruits were preserved at Case Nuove, again primarily from the Phase 2 contexts but also provided important evidence from the pressing site phases. The highest quantities were found in SU 5023, (surface of the square pit, Phase 2), while lower quantities were found in SU 5044 (square pit, Phase 2), SU 5014 (the fill of the basin, Phase 1.2), and SU 5048 (cistern, Phase 1.3). SU 5050 (well, medieval) was semi-sterile. The majority of records, including the economic plants, were preserved charred while others were in a dried state (or not surely charred). Fruits of cultivated plants prevail followed by cereals.

Although the basin (SU 5014) also preserved relatively lower quantities, these were important for what they revealed about the press and its abandonment. Charred endocarps of olives and uncharred grape pips were both found in the fill of the basin, albeit in low quantities suggesting both plants were transported to the site. Of interest there are also traces of charred seeds of *Lens culinaris* representing some legume cultivation for food.

The Phase 2 square pit contexts, by contrast, are rich in a wide variety of plants. In SU 5023, there is an interesting set of charred plant remains: pips of *Vitis vinifera* (estimated as ca. 60 pips/l; about half of them were broken), endocarps of *Olea europaea* (estimated at ca. 0.2 fruits/l, i.e., 23 endocarps were found in 103 liters, three of them were found whole and the others were fragments), traces of walnut endocarps, cereals including *Hordeum vulgare* (0.5 fruits/l) and *Triticum* species (0.3/l), and traces of pulses including *Lens culinaris* and *Vicia sativa*. *Pisum arvensis* is present in SU 5044. Weeds of cereal fields are represented by *Agrostemma githago*, again in SU 5023. While relatively abundant, these contexts do not resemble storage places—where high amounts of a single type of record may be expected—but rather display low quantities of different crops, consistent with residual accumulations of the agrarian activities performed at the site.

Cereals are particularly abundant in these Phase 2 contexts and show the same species variability as the pollen record: *Triticum aestivum*, *T. monococcum*, and *T. dicoccum* were found in SU 5023, and *T. durum* in SU 5014. Moreover, the charred chaffs including forks and rachis fragments, of barley and wheat are rare but interesting as they may represent the residue of in situ plant processing, threshing or winnowing. Together with the pollen data this points to cereals being grown and possibly processed near or at the site during Phase 2.

5.10 Geological Considerations, Land Evaluation/Use, and Mobility (AA, CG, AAM)

The processing point of Case Nuove appeared tied to local, small-scale agricultural production and was utilized, probably seasonably, by surrounding populations who moved to and from it to process

Table 5.9 Case Nuove, non-pollen palynomorphs and microcharcoals analysis (AMM/ER).

CASE NUOVE (Phase 2) Non-Pollen Palynomorphs and Microcharcoals										
Sample (CN)		*P1*	*P2*	*P3*	*P4*	*P5*	*P6*	*P7*	*P8*	*P9*
Stratigraphic Unit		5033				5044				
NON-POLLEN PALYNOMORPHS (concentration NPP/g)										
FUNGI	*Glomus* (incl. *G. fascicolatum*), *Delitschia* type, *Gelasinospora*, *Sordaria*-type, Sordariaceae indiff., *Sporormiella*, *Valsaria uariospora* type, *Spegazzinia*, *Alternaria*, *Puccinia*, *Tilletia*, Fungal spores indiff.	784	1045	34	39	824	696	476	302	659
ALGAE	HdV181, *Pseudoschizaea*, *Spirogyra*, HdV492, HdV182 cf.	73	116	246	91	206	107	14	101	282
ZOOMICROREMAINS	*Dicrocoelium*, *Trichuris*, Fragments of invertebrates indiff.	98	70	34	13	0	0	29	37	0
	Total Concentration of classified NPPs (NPP/g)	**955**	**1231**	**314**	**143**	**1029**	**803**	**519**	**440**	**941**
MICROCHARCOALS										
	125–200 µm (ch/g)	2719	813	178	20	130	232	1298	357	564
	201–500 µm (ch/g)	1176	581	68	0	76	98	534	147	423
	501–1000 µm (ch/g)	122	46	25	0	11	0	0	0	141
	> 1000 µm (ch/g)	24	0	8	0	0	0	0	0	0
	Total Concentration of microcharcoals (ch/g)	**4041**	**1440**	**280**	**20**	**217**	**330**	**1832**	**504**	**1129**

Table 5.10 Case Nuove, macrocharcoal analysis (AMM/ER).

CASE NUOVE Macrocharcoals		
Sample (CN)		***C1***
Stratigraphic Unit		**5023**
Chronology		Phase 2
Quercus sp.	—	4
	1*	3
	2*	25
	3*	13
UNDETERMINED		6
TOTAL		**51**

Rings bending: 1* low curve rings;
2* intermediate curve rings;
3* strong curve rings

	P10	***P11***	***P12***	***P13***	***P14***	***P15***
	5052		5051	5052	5051	
	1111	921	19625	1291	3212	711
	230	157	219	286	358	91
	7	3	44	21	13	0
	1348	**1081**	**19888**	**1599**	**3584**	**802**
	193	13	0	103	730	103
	104	0	0	34	571	39
	0	0	0	0	13	0
	0	0	0	0	0	0
	296	**13**	**0**	**137**	**1314**	**142**

grapes, olives, and, in Phase 2, grain. It seemed particularly important to focus both on the geology of the site that may have informed its selection as a processing site, on the various uses of land within the locale, and on movement within the locale. The tasks here were threefold: (1) To understand the on and near-site geology and hydrology; (2) Using both geological indicators and the results of the botanical analysis, to hypothesize ancient land use around the site; and (3) To analyze possible paths of movement around the site.

On-site and near-site geology

This site is located upon a hilltop in the rolling/hilly reliefs of the Mio-Pliocene conglomerates[8] (Pg of the Land Units map, Color Fig. 5.28), at a height of about 300 m asl. The area is located near the transition between these Upper Miocene-Pliocene hills to the east and the much steeper and older Lower Miocene "macigno" reliefs to the west (Fig. 5.26). This transition from "macigno" sandstone to clayey and fine sandy layers probably produced the many springs found to the W of the site, as ground-water in the permeable sandstones is forced to the surface when it encounters the clayey and fine sandy layers.

This intersection was visibly apparent on the site's surface in the form of two different geological domains: a northern, clayey domain ca. NW-SE strike and a dip of 20° to the W and a central more sandy domain SSW-NNE strike with a dip probably towards E (the latter not observed) (Fig. 5.27). The transition is abrupt and like the broader sandstone/clay intersection, may have produced water at or near the surface. The well (SU 5055) may have tapped this aquifer.

Land-use hypotheses

In order to better understand the human land-use around the agro-processing site, we used two principle datasets, land units and pollen data from the site itself. As will become clear, each dataset produced slightly different probabilities, usefully drawing attention to the biases and assumptions attendant in each type of data and to the artificiality of any attempt at ancient landscape reconstruction.

Our first hypothesis was based on the land units map (Color Fig. 5.28) and subsequent land evaluation hypothesis for the locale (Fig. 5.29). Fundamental again is the aforementioned Pliocene and "macigno"

Table 5.11 Case Nuove, macroremains analysis (AMM/RR).

CASE NUOVE Macroremains						
Sample (CN)		***M1***	***M2***	***M3***	***M4***	***M5***
Stratigraphic Unit		**5014**	**5048**	**5050**	**5023**	**5044**
Sediment volume (liters)		45	45	45	103	56
Chronology		Phase 1.2	Phase 1.3	Phase 3	Phase 2	
Juglans regia L.	endocarp		1		8	2
Olea europaea L.	endocarp	9	1		23	4
Vitis vinifera	pip	10(2)	1(2)	1(1)	259(6)	5(1)
	pedicels		1		2	1
Fruit trees		**19(2)**	**4(2)**	**1(1)**	**292(6)**	**12(1)**
Picea cf.	needle	2			1	
Other trees		**2**			**1**	
Cereals indiff.	caryopsis	1			38(1)	
Hordeum vulgare L.	caryopsis	1			52	3
	fork				1	
Triticum aestivum L.	caryopsis				7	
Triticum dicoccum L.	caryopsis				4	
Triticum durum Desf.	rachis segment	1				
Triticum monococcum L.	caryopsis				6	
	fork				2	
Triticum sp.	rachis segment					(1)
	caryopsis	1			21	2
cf. *Pisum arvensis*	seed					1
Legumes indiff.	legume				2(1)	
Lens culinaris Medicus	seed	5			9	3
Vicia sativa (cf. ssp. *segatalis*)	seed				1	
Grains and legumes		**9**			**143(2)**	**9(1)**
Agrostemma githago L.	seed				1	
Anagallis arvensis L.	seed		(16)		2(4)	(5)
Atriplex sp.	achene					(2)
Calendula arvensis (Vaill.) L.	achene				(1)	
Carduus sp.	achene				1	
Chenopodium album L.	achene	(1)	(3)		19(10)	
Chenopodium polispermum L.	achene				2	
Coronilla emerus L.	legume		1			
Malva sp.	seed				1	
Medicago arabica (L.) Huds.	legume					(1)
Medicago lupulina L.	legume		(1)			(8)
Medicago sp.	seed	1			1	
Persicaria maculosa (L.) Gray	achene					1(6)
Polycnemum majus A. Braun	achene					(1)

Table 5.11 cont'd Case Nuove, macroremains analysis (AMM/RR).

CASE NUOVE Macroremains						
Sample (CN)		***M1***	***M2***	***M3***	***M4***	***M5***
Stratigraphic Unit		**5014**	**5048**	**5050**	**5023**	**5044**
Sediment volume (liters)		45	45	45	103	56
Chronology		Phase 1.2	Phase 1.3	Phase 3	Phase 2	
Polygonum aviculare group	achene		8		51(3)	6(1)
Rumex crispus/obtusifolius	achene	1			2(2)	
Trifolium arvense L.	legume	(1)			(1)	
Trifolium campestre L.	legume	(1)			(1)	(3)
Trifolium sp.	chalice			1		
Verbena officinalis L.	mericarp				1	
Ruderals s.l.		**2(3)**	**9(20)**	**1**	**81(22)**	**7(27)**
Callitriche sp.	mericarp				(1)	
Carex cf. *divulsa* Stokes	achene				(1)	
Carex praecox type	achene				1	
Carex sp.	achene		4(2)			(2)
Lemna sp.	seed					(1)
Rumex sanguineus/conglomeratus	achene				3	
Stachys sylvatica L.	mericarp				1(3)	(1)
Wet Environments			**4(2)**		**5(5)**	**(4)**
Medicago minima L.	legume				4(1)	
Prunella vulgaris L.	mericarp		1			
Other Environments			**1**		**4(1)**	
Bromus sp.	caryopsis	(1)			2	
Galium sp.	mericarp	1				
Poaceae-wild group	caryopsis				2(2)	1
Mentha sp.	mericarp					(1)
Ranunculus sp.	achene	1				
Rumex sp.	achene		1			
Alia		**2(1)**	**1**		**4(2)**	**1(1)**
UNDETERMINED				1	4	1
TOTAL		**34(6)**	**19(24)**	**3(1)**	**533(38)**	**30(34)**

CHARRED

y(x): x= number of records found in the 3rd sieve from which 100 ml were analyzed; y= the 1st and 2nd sieves that were wholly analyzed

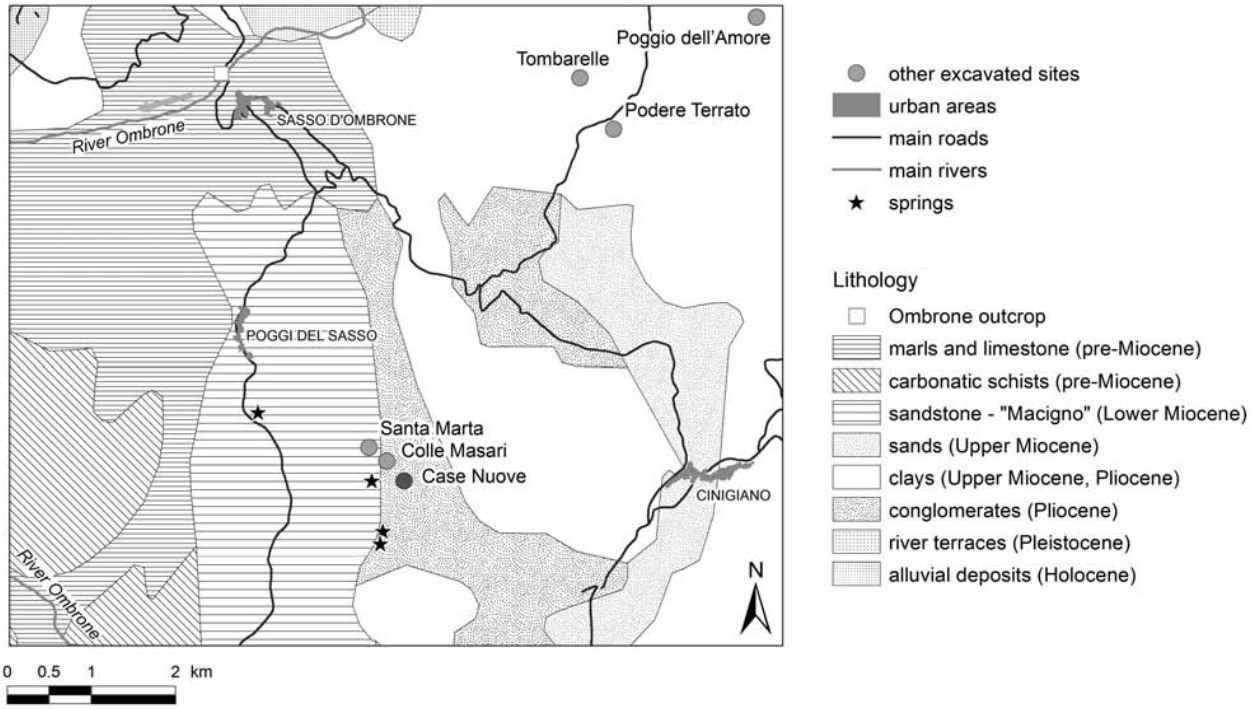


Fig. 5.26 Case Nuove, map of locale showing geological and hydrological features (AA).

transition. The Pliocene areas are characterized by calcareous soils with discrete water availability that are generally more suitable for crops and tree crops, while the "macigno" yields drier, more acidic soils that are less suitable. The result is a highly variable potential agricultural landscape, with pockets of good land alternating with stretches more suitable for forests or scrub. The site itself is situated in marginal land for crops and tree crops (S3), but better areas lie immediately to E and W (S1). The assignment of this processing site to marginal land where it would remove no useful land from cultivation, but proximate to productive land whose products it might have processed, may be purposeful. A narrow band of high and medium suitability for crops was also found running to the S of the site.

The pollen data taken from archaeological contexts at the site provided additional information. In the case of Case Nuove, the data suggested the following points about the late antique agricultural landscape:

1. Pasture dominated the overall landscape. Woodlands, mostly deciduous, were not immediately adjacent to the site and probably lay more than 1 km distant from it.
2. In late antiquity, grain fields lay close, if not immediately adjacent to the site.
3. In late antiquity olive trees lay more than 1 km away from the site, but, in both the late Republican period and late antiquity, olive and grape fruits were transported to the site.
4. Although grape yielded very low pollen numbers, given the low yield and short transfer of *Vitis*, it cannot be excluded that vines were grown, in small quantities, within 1 km of the site during late antiquity. Grape was transported to the site in both the late Republican and late antique periods.

These basic principles were then applied to the land units map, using the below-listed assumptions, to produce a first hypothesis about the distribution of the various land uses (Fig. 5.30):

1. Lv (N) = deciduous oak forest. Steep to very steep slopes, with shallow, slightly acid, moderately stony, medium-coarse textured soils; therefore, probably kept under natural forest.

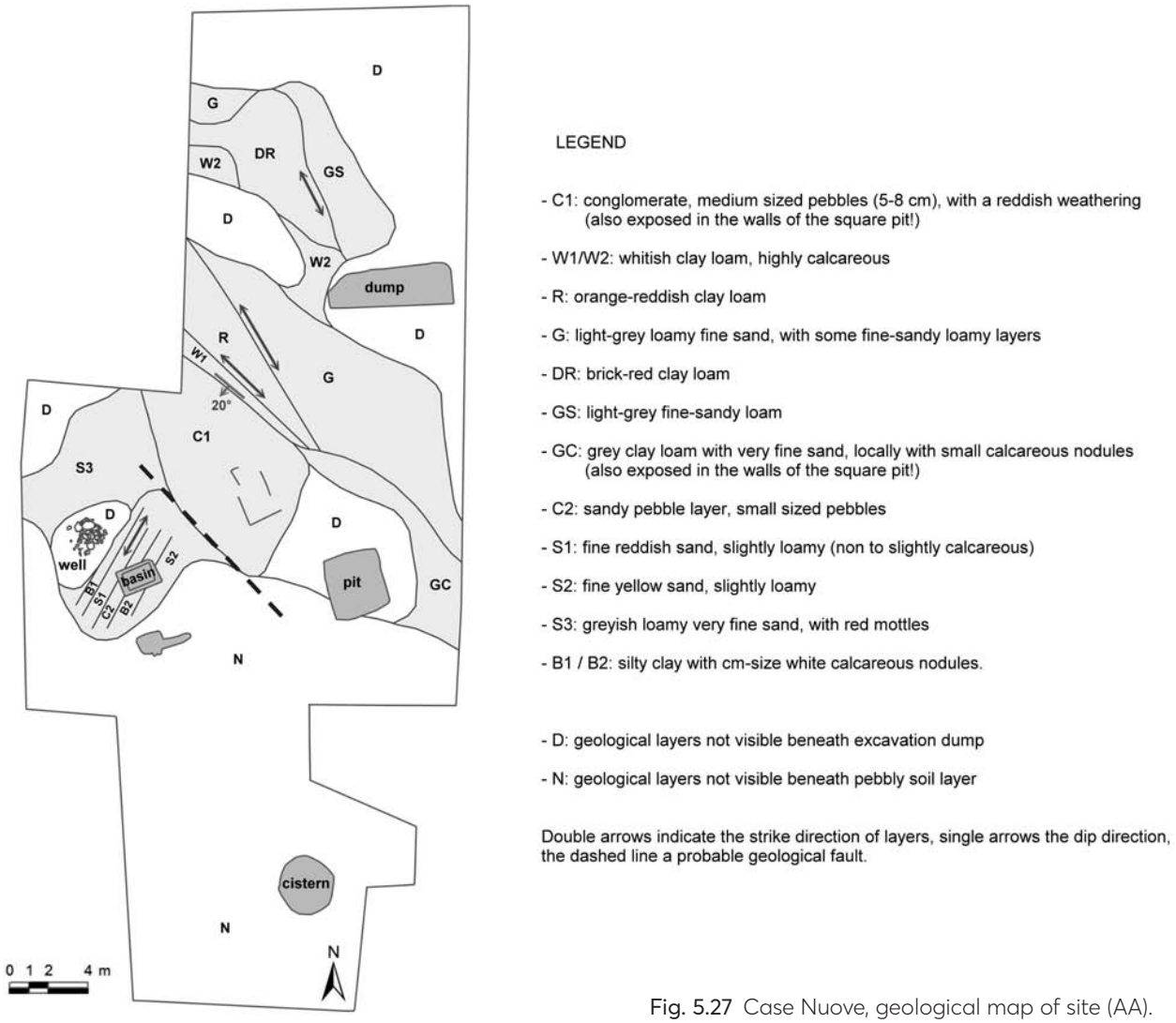


Fig. 5.27 Case Nuove, geological map of site (AA).

2. Lo (S2) = forest, possibility of some grain. Undulating broad hilltops with moderately deep, slightly acid soils, locally slightly stony, medium-coarse textured. Cereal cultivation is possible, though with some difficulties due to the low soil water reserve.

3. Pa (S1) = cereals, pasture, occasional vineyards <1 km away. Deep, but not stony, fine textured calcareous soils in a hilly rolling landscape, thus, suitable for any form of agro-zootechnical land use. The relative ease of working these soils might make them too "precious" to use for olive trees.

4. Pv (S1) = cereals, pasture. The same soils as Pa, but locally subject to water logging, thus, suitable to any form of cultivation or land use not sensitive to soil water excess (as vineyards and most trees are).

5. Pg (S3) = predominantly pasture, with olives >1 km away. Moderately deep, moderately stony calcareous soils in a hilly/rolling landscape. The stoniness might hamper plowing, hence the presumed preference for pasture and olive trees.

A second variation on this hypothesis might suggest a number of variations on the first. Most notably, the predominance of pasture, suggested by the pollen data, indicates that even highly suitable agricultural land near the site (S1 and 2 categories) was probably

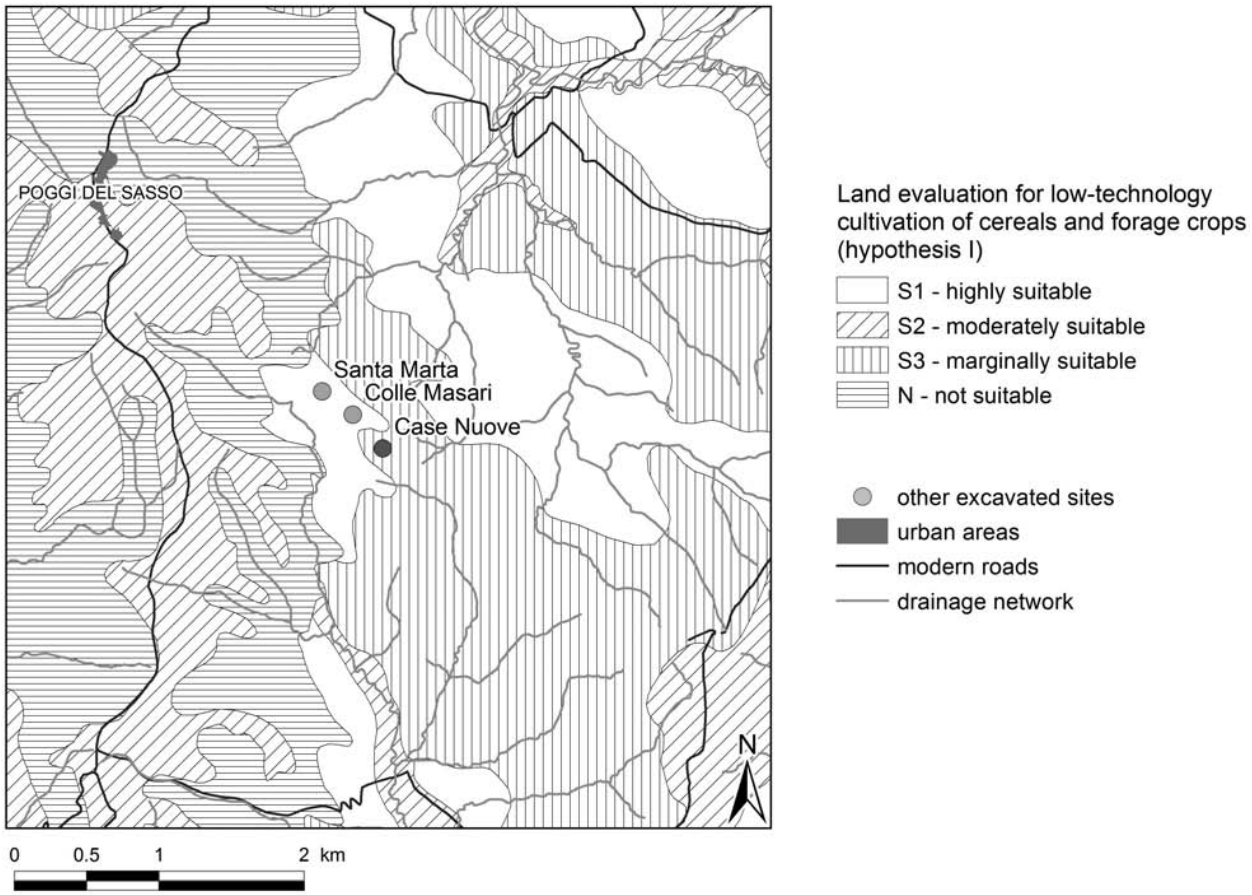


Fig. 5.29 Case Nuove, land evaluation map of locale, hypothesis I (AA).

in part or alternated in use for pasture rather than "high-value" crops. Conversely, relatively less suitable land (S2–3) may have been used for olives because of the difficulties of plowing these stony soils. In short, the general parameters suggested by the pollen data caution against any strictly functionalist reconstruction in which land with higher general suitability was necessarily used for the most environmentally demanding crop it could support. Rather, the land seems to have been used in ways not entirely predictable by environmental data but rather governed, at least in part, by human agency.

Mobility: Least-cost path and viewshed analysis

The landscape hypotheses above suggested a highly variable agrarian locale. The pollen and macroremains further suggested that, at least in late antiquity and possibly earlier, the olives and grapes processed at Case Nuove may not have been grown in the immediate vicinity but were transported to the site, possibly over some distance. The fact that no habitations were found on the site itself likewise indicated that the people who used the site—either farmers from elsewhere or inhabitants of the nearby villa—traveled to get there. All of these factors suggested the need for an understanding of movement potential around the site.

To this end, settlement and topographic data were analyzed for potential route ways (see Ghisleni 2010). Only late Republican/early imperial period sites and the one late antique period site of Santa Marta were selected in order to parallel the chronological data from the botanical remains. A least-cost analysis from Case Nuove to these sites was generated. In GIS operations, the cost-path function determines the path from a destination point to a source. Once a cost-distance or path-distance function is performed, one can output the least-cost (shortest) path from a source point to one or more

chosen destinations. For moving in our area on foot, we considered the following factors: slope expressed in percentage (cf. Leusen 2002:6) and the difficulty of crossing small (sm), medium (me), and major (mj) rivers, their weight expressed through the width of a buffer. After some experimenting, the following relative weights were applied:

[cinig_slope] * 0.50 + [sm_rivers_sw] * 0.10 + [me_rivers_sw] * 0.15 + [mj_rivers_sw] * 0.25[9]

The least-cost analysis was plotted both as least-cost paths through the landscape and as least-cost surface zones representing areas having the same effort-distance from the site (Fig. 5.31 and Color Fig. 5.32, respectively). The most viable least-costs paths were then field-checked by walking. Finally, to provide some sense of the historical viability of these GIS-generated route-ways, the roads from the 1823–1825 Leopoldino land registry map (which in this area are both relatively complete and accurate, see Ch. 3 above), were overlaid with the least-cost paths (see Fig. 5.31).[10]

The results of the least-cost path analysis by zones suggested, not surprisingly, that the area immediately surrounding the site was most accessible to it, including the site of Santa Marta. To the northeast of the site and about the same aerial distance away, another cluster of sites fell into the next category of difficulty. A third, more numerous group of late Republican sites (labeled large farms/villages and houses) to the S lay in the fourth category of difficulty. The paths analysis indicated an easy route along a ridge running E and W, the very ridge atop which Case Nuove itself sits (see Fig. 5.31); while no known Roman sites were located immediately adjacent to this route, it runs east towards the late Republican and late antique site of Pievina (Ch. 4), and beyond to the slopes of Monte Amiata.

The Leopoldino map further indicated that some of the paths generated through least-cost path analysis more or less corresponded to a series of early 19th c. roads. One ran north-south directly adjacent to Case Nuove and linked all three of the major site-groupings described above (the southern farms and the villa, with a branch reaching the north-eastern small sites) (see Fig. 5.31). This road was part of a network that connected the coastal plain to the southwest (which in Roman times included the town of Roselle) with Montalcino and Siena to the northeast. It is interesting to note that, a portion of this road was termed the via Dogana, a customs route for taxing

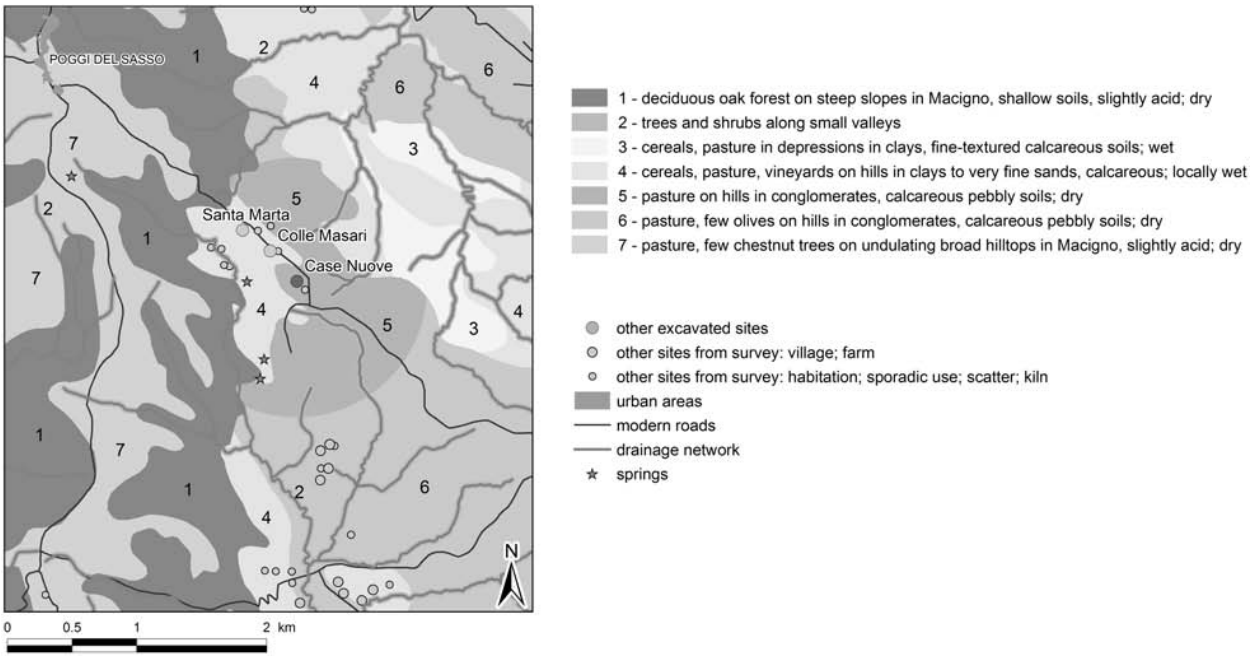


Fig. 5.30 Case Nuove, land evaluation hypothesis of area around Case Nuove, integrating land evaluation and pollen data (AA).

transhumant shepherds. Another 19th c. route shown on the Leopoldino followed the east-west ridge road that ran adjacent to Case Nuove and Santa Marta.

Field checking the GIS-generated routes yielded more mixed results. The sites to the south proved impossible to access from Case Nuove: the early 19th c. route-way had been cut by a series of fences and high vegetation, demonstrating the importance of both landholding and maintenance as factors in routeway perpetuation over the *longue durée*. Without those obstacles, a stretch of steep slope is the most significant barrier to travel between Case Nuove and the S, traversed in the Leopoldino map and today by a series of switchbacks.

These analyses not only confirmed the strong, obvious connections between Case Nuove and the nearby-villa site to the NE, but also suggested somewhat more strenuous, but viable connections to farms to the S (see Color Fig. 5.32). Indeed, it suggested that the site of Case Nuove sat almost precisely on a confluence of N-S and E-W routes, which existed at least as early as the early 19th c. While the lessons of field checking provided a useful caution as to the variability of routeways over time, the bulk of the evidence—least-cost path, historical maps and settlement patterns—all indicate that the agro-processing site of Case Nuove lay at a kind of crossroads.

It also seemed possible that Case Nuove's visibility might have played some role in its siting: highly visible markers in the landscape attract attention and are used for navigation and self-positioning and thus influence movement (Tilley 1994; Fitzjohn 2007). Could Case Nuove have been positioned to be visible at distance by travelers along these routes? Viewshed analysis carried out in ArcGIS indicated that Case Nuove could have been an important lookout. A large part of the surrounding landscape is visible from it and, thus, the site should also visible from its

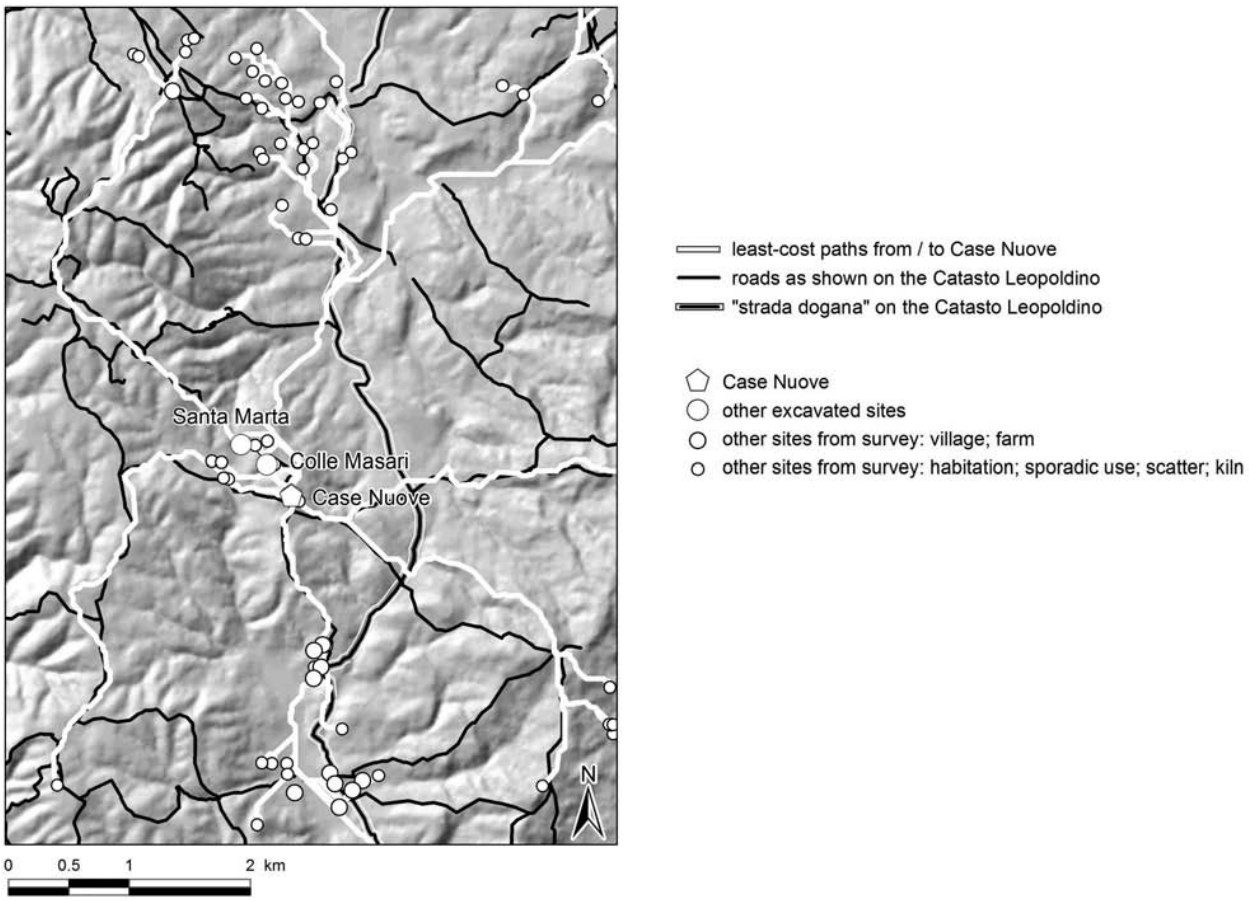


Fig. 5.31 Case Nuove, least cost path analysis for movement from surrounding Roman sites to Case Nuove. Routes on the 19th century Leopoldino map are also indicated (AA).

surroundings (Fig. 5.33). Case Nuove, then, is a panoptical site which permitted the survey of surrounding territory while serving as a reference point in the surrounding landscape. This might suggest that the routeways did not develop around it, but rather that the site was deliberately sited to monitor extant routeways. The villa of Santa Marta, inversely, is relatively hidden from view looking outwards enclosed by surrounding hills.

When overlaid with the land use hypotheses, the potential routeways analysis provided further indications of the site's place in its locale. The most likely place for small olive groves lay some kilometers to the south, while small vineyards may have dotted the land some 0.5 km to the E and above all to the W, where the villa was situated. Cereals may have been grown in the same areas. The area suggested for olives is accessed via the N-S route, while the E-W route provided local access to the good cereal/vineyard lands.

This scenario, unfortunately, derives from late antique pollen evidence, not the Republican period of the presses. If we were to assume that land use was relatively conservative—a dangerous assumption given the abandonment of the press—and that similar patterns of oleo-viticulture predominated in the Republican period, we might conclude that a mixed population used the site, farmers from nearby pressing grapes, and others from the south pressing olives.

5.11 Coins (FM)

Case Nuove produced nine coins (Fig. 5.34, Table 5.12). The earliest as dated to 15 BC and probably assignable to *IIIvir C. Plotius Rufus*,[11] was found in the topsoil. The other examples (SF 205002, 205003, 205004, 205005, 205006, 205007, 205008, 205009), for the most part illegible, derive from the late antique fills of the square pit. These coins cover a relatively short chronological arc: on the basis of the dimensions of the flan, some three examples seem to date to the second half of the 4th c. (of which one seems to depict the emperor dragging or suppressing a captive, common in this period) and five date between the end of the 4th and 5th c., one of which depicts the two frontal victories, iconography datable to the last years of the 4th c. and to the reign of Valentinian III.

This nucleus of coins echoes the general coin circulation patterns in the first half of the 5th c., which benefited from the continued circulation of issues from of the second half of the preceding century, which were never officially removed from circulation. As has already been noted from the ceramics and faunal material, the coins support the notion of a unified stratigraphic context laid down in a short period sometime around the middle of the 5th c.

5.12 Small Finds (SCE)

Compared with the other sites excavated by the project, the Case Nuove presented an extremely heterogeneous assortment of small finds. Most of these came from SU 5014, the fill of basin SU 5005. Given their diversity, including nails, glass, pieces of worked stone, parts of a horse harness, and parts of a possible metal apparatus, this deposit was most likely formed via a deliberate collection of detritus, some of which clearly came from a clean up of the site itself, some of which came from afar. The second locus of finds, the fill of the square pit, was less numerous and less diverse, comprising a secondary deposit of local and non-local detritus.

Three finds seem to be part of a horse harness. One copper alloy artifact (SF 305025, 305026) consists of two fragments of a thin sheet of metal in cruciform design, with a central boss and holes on the extreme point of each arm (Fig. 5.35). Comparanda support the identification of this artifact as a harness mount. Cruciform junctions are attested at Haltern on the Rhine from the Augustan period (7 BC–9 AD) (Müller 2002: pl. 53, n. 588). Such junctions would have been located on the shoulder or haunch of the animal, one on each side, as well as on the breast of the animal (Bishop 1988:105–106, cf. 114, fig. 30). The mount could also be attached to the leather straps of the bridle to secure them.

Two other finds from the same context include harness pendants, nearly identical to one another (SF 305011 and 305038). These well-preserved pendants consist of a heart-shaped backing that tapers into a globular finial, while the top loop folds retroflexively downward, with the finial in the shape of a wolf's head (Fig. 5.35). This particular design of pendant is identical with another pendant coming from the Roman military base at Vindonissa (Windisch, Switzerland) established around 15 AD (Unz and Deschler-Erb 1997:41, table 55, n. 1487). Another example comes from Albias/

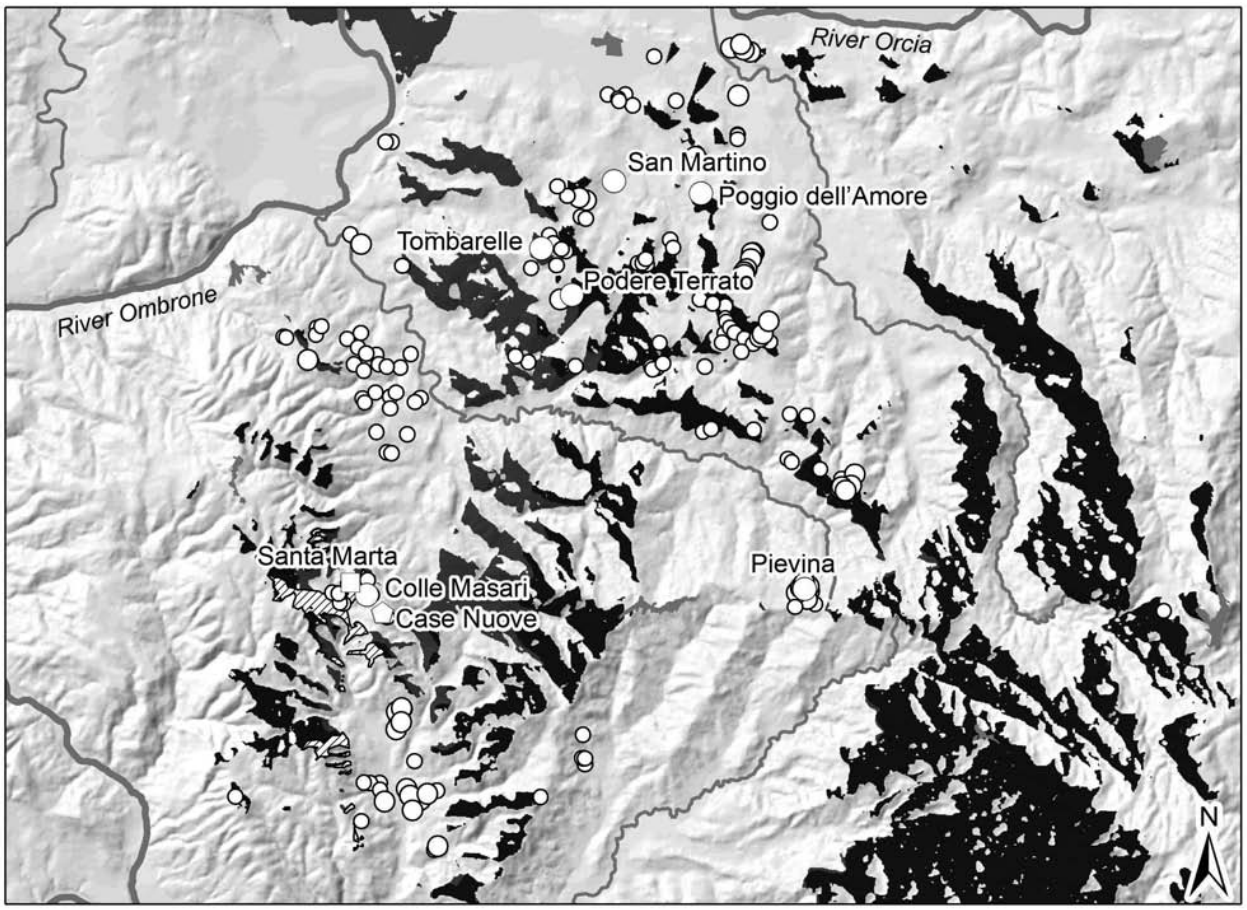


Fig. 5.33 Case Nuove, viewshed analysis showing visibility of Case Nuove from surrounding landscape (AA).

Table 5.12 Case Nuove, coins by stratigraphic context, within which organized chronologically (FM).

Phase	Arch. Context	SU	Authority and Mint	Date	Metal and Denomination	Obverse	Reverse	Weight and Size	Reference	SF
2	square-pit (SU 5059)	5008	Uncertain attribution	late 4th/first half 5th c.	AE4	Illegible	Trace	1.23 g 12.50 mm		205002
		5022	Uncertain attribution	second half 4th c.	AE3 or AE4	Illegible	Emperor, with r. hand dragging captive (*gloria romanorum: uirt exerc romanor*)	1.50 g 16.00 mm		205003
			Uncertain attribution	late 4th/first half 5th c.	AE4	Illegible	Illegible	1.43 g 12.50 mm		205004
		5036	Uncertain attribution	second half 4th c.	AE3	Illegible	Illegible	1.81 g 15.30 mm incomplete		205005
		5023	Uncertain attribution	second half 4th c.	AE3	Illegible	Illegible	1.33 g 14.00 mm		205008
			Uncertain attribution	late 4th/ first half 5th (383–392 or 430–437)	AE4	Illegible	Two Victories facing one another (victoria auggg; victoria aug; victoria augg)	1.18 g 12.00 mm		205006
			Uncertain attribution	late 4th/first half 5th c.	AE4	Illegible	Trace (Victory to l.?)	0.66 g 12.20 mm		205007
			Uncertain attribution	late 4th/first half 5th c.	AE4	Illegible	Illegible	0.95 g 1.10 mm		205009
modern	topsoil	5001	Augustus, Rome	15 BC	as	Illegible	[…] C PLOT[…]. Trace of Numa-head	9.17 g 24.40 mm	RIC I², p. 71, n. 390–393	205001

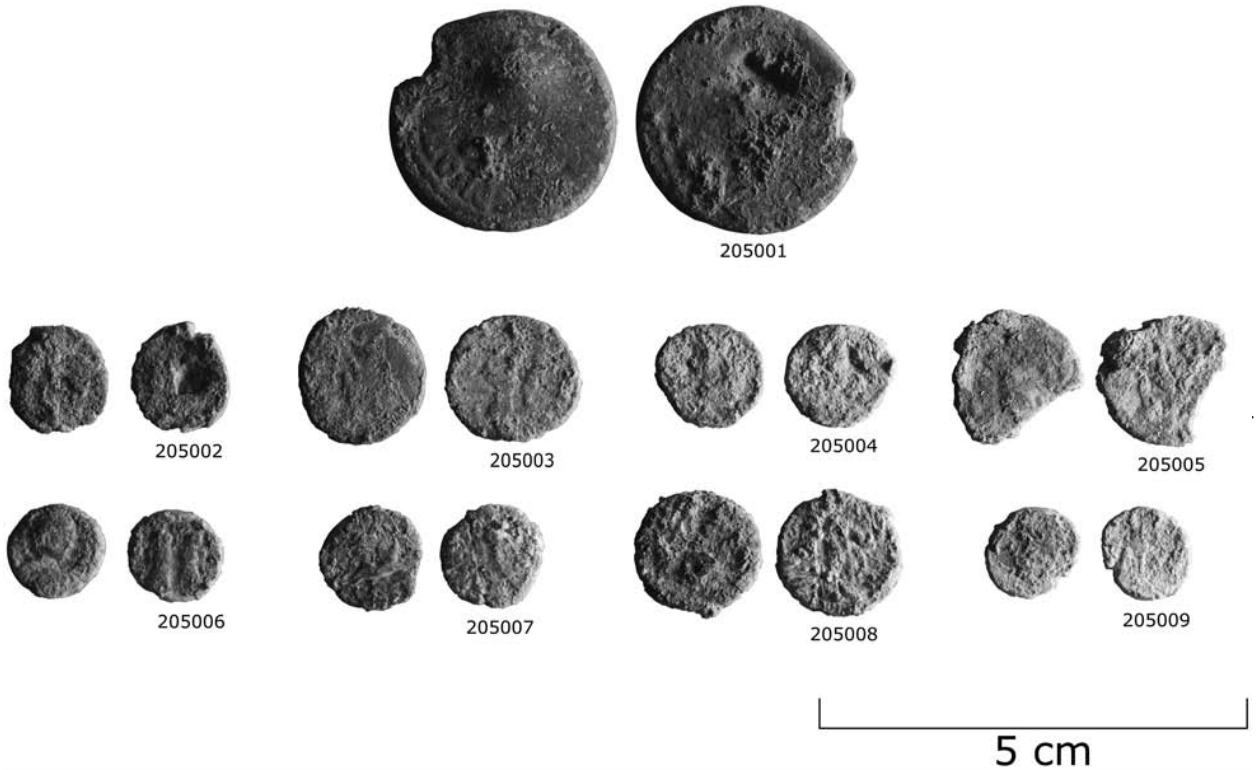


Fig. 5.34 Case Nuove, coins: Augustan as (SF 205001), 5th c. nummi (SF 205002, 205003, 205004, 205005, 205006, 205007, 205008, 205009) from square pit (SCE).

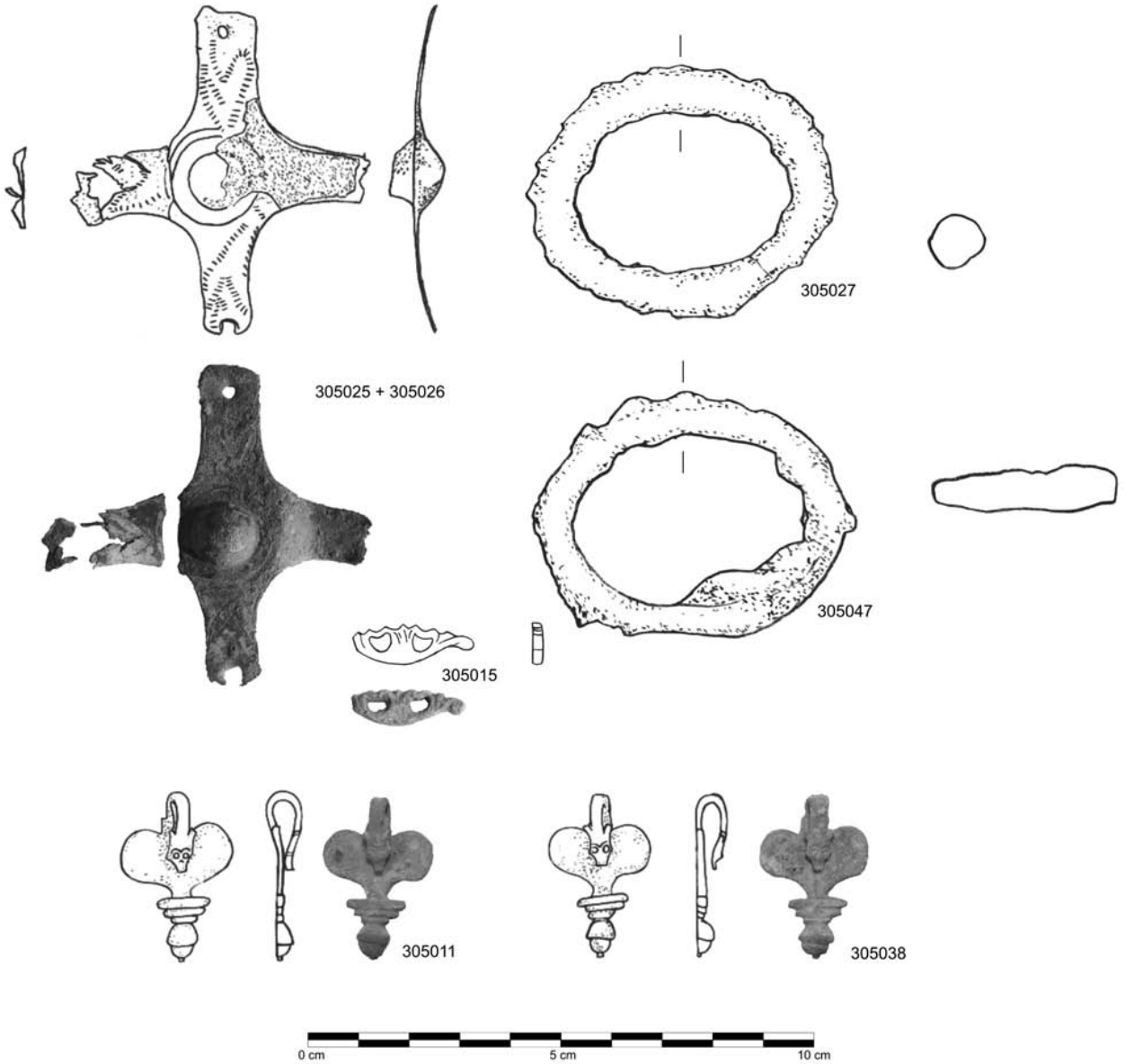


Fig. 5.35 Case Nuove, small finds from SU 5014: harness mount (SF 305025, 305026); harness pendants (SF 305011 and 305038); ring (SF 305027); and collar (SF 305047) (SCE).

large ring (SF 305027), and a large collar (SF 305047) (Fig. 5.35), whose axial dimensions approximate that of the ring, and 26 fragments of iron lamina.[12]

In consideration of this last group of finds, two principle hypotheses can be put forward: either they are all unrelated, sporadic detritus, redeposited in the basin from elsewhere (like the copper alloy artifacts) or they are in part or entirely related to one another, part of the same machine or device. If the latter, it is possible such a device was located near the basin, and perhaps belonged to the press. Alternatively, such a device was located elsewhere, and the parts were dumped into the basin after use.

Given their context, it is worth considering whether these fragments belonged to part of the pressing apparatus. Against this interpretation, the hypothesized beam and lever press would require few, if no, metal parts, just perhaps a pulley to raise and lower the press-beam. Indeed, the typical lack of metal finds in excavations of press installations

makes it difficult to locate where, precisely, such components would have been used and ancient sources provide little guidance.

It is also possible that these parts could be part of a portable olive mill. Cato describes the use of iron pivots, plates, and rings in the construction of a *trapetum* (Cato, *Agr*. 20–22; Drachmann 1932; Brun 1986:72). As mentioned above, the corresponding size of the ring suggests that it went around the same axis as the collar. Cato mentions that a one-pound iron collar should be placed above the opening for the wooden push-beam (*insuper foramen librarium ferreum digitos sex latum*), and that iron rings should be placed around the millstone to prevent the wooden beam from chafing against the stone (*armillas IIII facito, quas circum orbem indas, ne cupa et clavus conterantur intrinsecus*). Thin iron plates were also inserted to secure the wooden bar. Cato says that the collar be perforated in order to secure it with a bolt, although the exemplum from Case Nuove is unperforated. Lead flows were recovered from the basin, which were also recommended by Cato for fastening sockets on the mill (Cato, *Agr.* 20.). We could consider the possibility that a *trapetum* was set up near the press, for which there is no longer any trace in the archaeological record.

As a general observation, if the parts found in the basin were part of the production activities, they must have been as part of a device that inflicted a significant degree of stress, torque, or other wear, such that iron reinforcements were necessary.

Case Nuove also produced a significant quantity of nails, some 39 fragments/31 MNI, the third highest count in the project. The majority of these derive from the SU 5014 fill of the basin.

Perhaps the most surprising small finds, again from the fill of the basin, were six pieces of worked marble (SF 505001), four joining fragments of marble slab with raised border (Fig. 5.36) and a large cylindrical marble fragment, perhaps sculptural (SF 505002). These most likely came from Santa Marta and are the strongest testimony of a close relationship between the two sites at the time the Case Nuove presses were abandoned.

Two other notable finds came from the late antique fills of the square pit. Four fragments of hand-sized grinding stones (SF 505005) (Fig. 5.37) were found in contexts from the square pit. Together with the cereal pollen and macroremains, the mills point to both potential threshing and grinding on the site.

5.13 Glass (SCE, ERR)

The site also yielded a high quantity of glass vessel fragments (Fig. 5.38 and Table 5.13): 90 shards (118.69 g; EVE 1.17)—the third highest count in the project. These fragments were split between surface finds, the fill of the basin, and the fills of the square pit. The majority of diagnostic shards came from bowls and drinking glasses, including fragments of an Isings 3 bowl (SF 405024) datable to the 1st. c. BC/AD, which comes from SU 5014/5031. Another ribbed bowl, yellow in color (SF 405015), also comes from SU 5014. An additional noteworthy glass find comprises a fragment of a double bottle, SF 405026. Multiple fragments of beakers (e.g., SF 405021), which can be found in Phase 2 contexts, speak to the reoccupation of the site in late antiquity. Two records, SF 405043 and 405044, are modern.

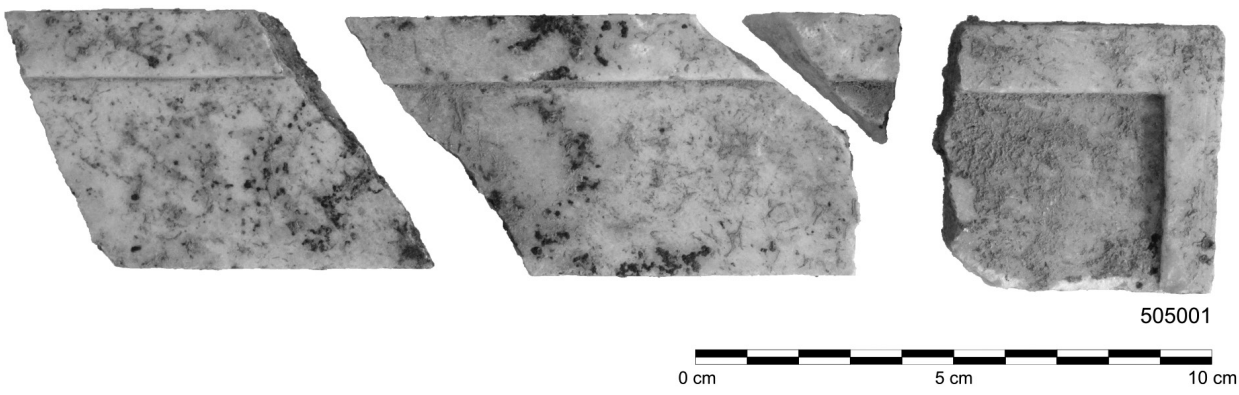


Fig. 5.36 Case Nuove, marble fragments (SF 505001) from SU 5014 (SCE).

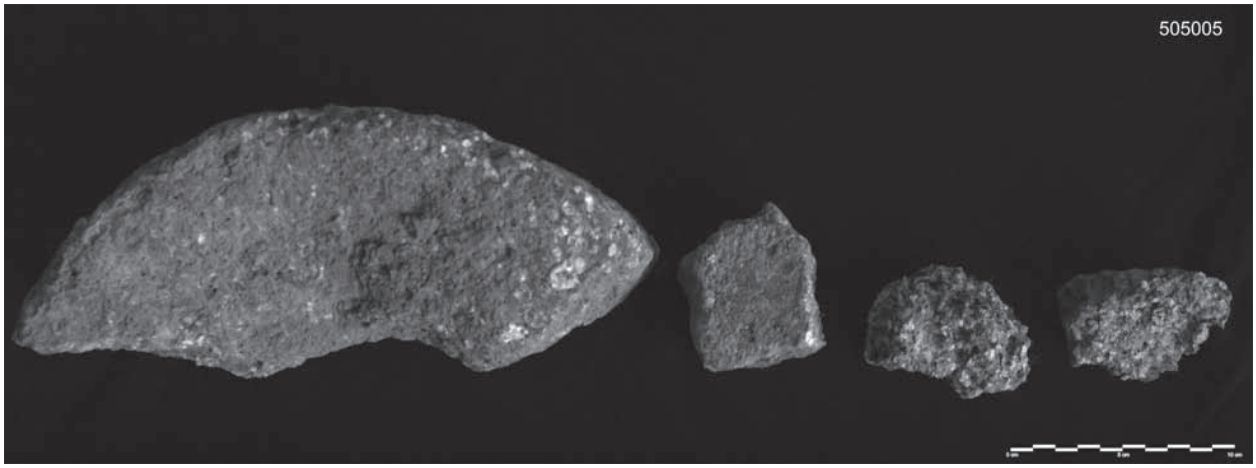


Fig. 5.37 Case Nuove, four hand mill fragments (SF 505005) from SU 5044 (SCE).

Table 5.13 Case Nuove, quantification of glass vessels by fragment count, weight, and estimated vessel equivalent by depositional phase (SCE).

Phase	CN Topsoil			CN 1.2			CN 2		
	fr	w	eve	fr	w	eve	fr	w	eve
Beaker	—	—	—	1	0	0	30	33.19	0.82
Double Bottle	—	—	—	1	13	0	—	—	—
Isings 3/Ribbed Bowl	—	—	—	19	57.5	0.35	1	2	0
Small Amphora/Bottle	—	—	—	—	—	—	1	0.5	0
Small Bottle	1	0	0	—	—	—	—	—	—
Small Bowl	—	—	—	—	—	—	1	0.5	0
NonId	13	2	0	14	3.5	0	8	6.5	0

5.14 Building Materials (AA)

The building stones encountered on the site were of two principle types, which appeared unevenly in the two major masonry structures:

1. Subangular marly limestones, size up to about 50 cm, used in the construction of the well (SU 5055, Phase 1)

2. Rounded and sub rounded pebbles and cobbles, average size 10–12 cm, up to 35–40 cm, found in the well and the fill of the square pit (Phase 2)

The closest outcrops of marly limestones belong to the Flysch formation while the pebbles could well originate from the Pliocene conglomerates, a formation that in particular in the south-western part of the mapped area contains rounded pebbles and boulders of that size. Both stone types are found along the Ombrone River near Sasso, where there is a large natural outcrop of the Flysch formation and where the river itself carries the pebbles and boulders (see Fig. 5.26). The "road" distance from this place to the site is ca. 6.5 km.

5.15 Discussion (KB)

Case Nuove represents one of the only stand-alone production sites thus far excavated from

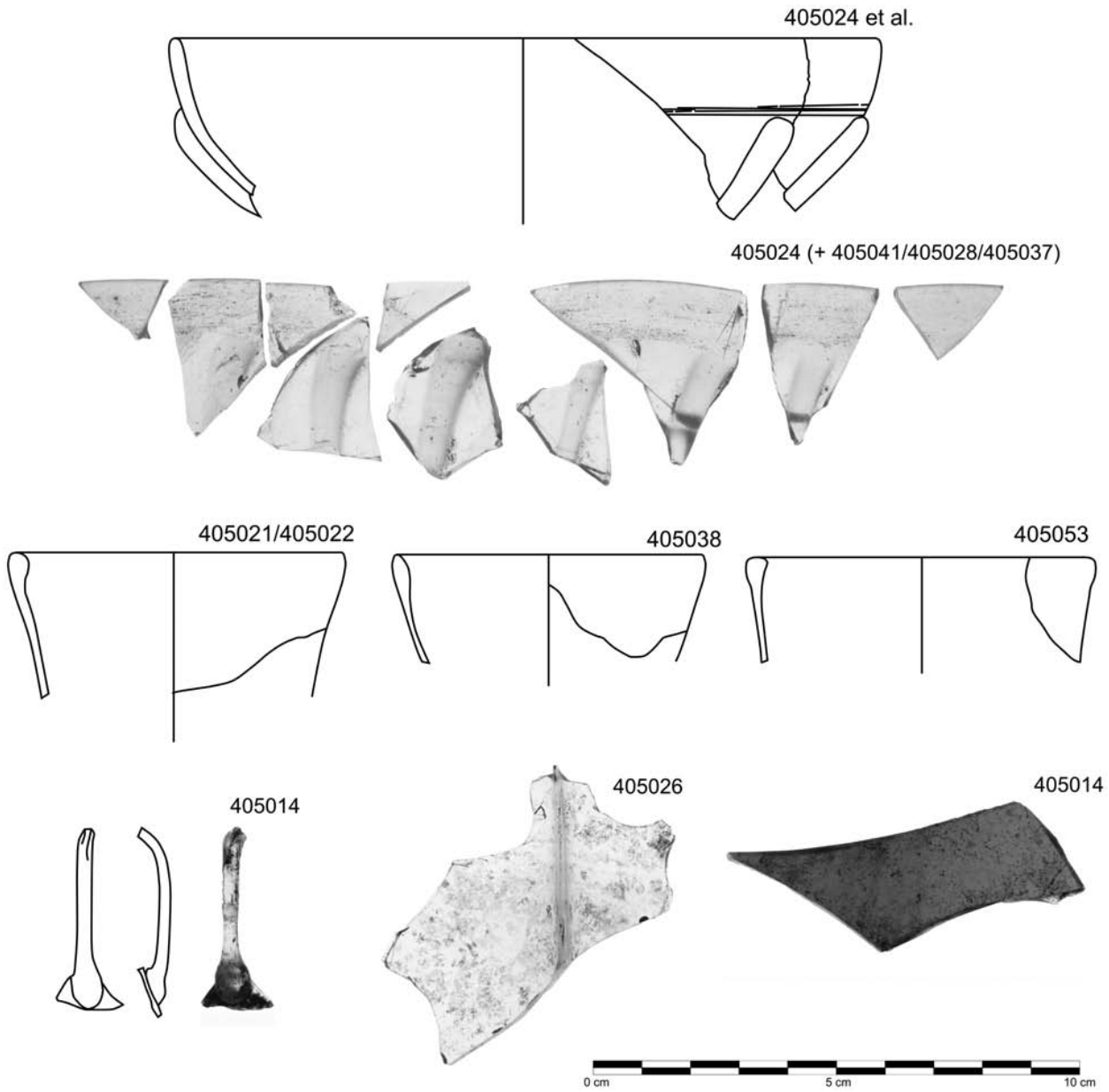


Fig. 5.38 Case Nuove, representative diagnostic glass fragments (SCE).

Roman Italy. The excavations here revealed a primitive pressing apparatus, composed of a *fouloir* or foot press almost certainly for grapes, and a rudimentary hand press and tank, possibly for olives and more likely for both grapes and olives. The absence of any roofed buildings suggests an absence of permanent habitation, and intensive surface survey on the hilltop and in the vicinity failed to yield any associated habitations. The site, thus, appears to have been a standalone press site, used in its first phase for olive and/or wine production, and seasonally in the fall months. During the late 4th and first half of the 5th c. AD, this hilltop site may have been used for the winnowing of grain.

Material and topographic investigation revealed the site's locale to be both variegated and variable. Olives were almost certainly not proximate to the site, necessitating their transport over some distance, while vineyards may have been somewhat closer. The movement to and from the fields would have

been highly channeled along the few paths of easier movement.

While the installations at Case Nuove little resemble the monumental *torcular vinarium* and *olearium* of central Italian villas, the excavated remains, plus the combined evidence of residue and botanical analysis strongly suggest a pressing site used for both olive and grapes. As noted above, determining the quantity of crop processed by presses is tricky but the medium-sized tank, the modest *fouloir*, and the relatively primitive structure of the press together with the fact that it lacked any kind of surrounding structure all point to a small-scale operation, constructed, with the exception of the *opus signinum* surfaces, with few resources. Finally, while sparser than the abandonment materials, the use-phase of the late Republican dump yielded a limited formal range of ceramics and mixed faunal species, suggesting small-scale husbandry and generally modest diet.

These indicators, plus the position of the pressing site alone in the landscape, suggest a site used by surrounding small farmers as a kind of collective pressing site, as still takes place today in Italian villages. As the combination of least-cost path analysis and historical data suggested, the site sat on a possible E-W ridge route and possibly near a N-S track, making it particularly accessible. Were the land use hypothesized from late antique data similar to that in the late Republic, these farmers might have come from the valley of farms ca. 2 km to the south, along the E-W routeways, as well as from the immediate surrounds, carrying their crops to a common processing point where collective investment constructed presses for common use installation. Grapes would have been pressed in the early fall, with the olives arriving somewhat later.

The nearby "villa" of Santa Marta may have played a role in this press apparatus. Recent excavations have suggested that the "villa" during the press was operating was really a large farm, with large productive buildings but no luxurious living quarters. If this were the case, the settlement there was both the closest one to Case Nuove during its period of operation and the only one in the whole locale that would develop into a villa. A preferential relationship between Case Nuove and the villa of Santa Marta is thus likely.

The nature of that relationship, is more difficult to determine. One possibility is that the processing site was simply an outpost of the farm, processing only the products of its lands. Typically, processing points associated with villas or large farms are located within the settlements themselves in the so-called *villa rustica* and indeed, a press tank from this phase was found at Santa Marta, suggesting that the farm's grapes and/or olives were processed internally. Thus, the choice to locate a small press apart from the farm on a possible local routeway intersection might be better interpreted as an effort to expand the influence of the settlement at Santa Marta by constructing such a site to be used by other inhabitants of this landscape. The fact that the farm/villa itself has virtually no viewshed, while that of Case Nuove is expansive, meaning that a user of the site can see much of the surrounding landscape and in turn be seen, may also have influenced this decision. Whether interpreted as a brand of rural euergetism or as a subtle means of controlling territory by offering a centralizing, panoptical processing point, the construction of Case Nuove could be a deliberate, early effort on the part of the proprietor to broaden his or her influence over the territory.

It is also possible that the site was largely the collective effort of local peasants. Roman agricultural communities of all kinds engaged in a constant balancing act between self- and collective interest. Making shared, collective use of certain resources was an attractive proposition as it lowered the individual investment required, but it also created possible tensions around the equitable allocation and access to those resources (Grey 2011:112–119). Presses, along with granaries, wells, and threshing floors, are among the most common archaeological footprint of collective processing activities (Grey 2011:112–119; Grey 2012:639). The collective use of rural olive presses has been hypothesized for archaeological examples in North Africa and Syria, while textual testimony describes their use in Egypt (Stone 2000:721–722; Tchalenko 1953:30, 41, 44; P. Nessana. III.32 [6th century AD]; PSI [Papyri Greci e Latini] VI.711 [311 AD, Oxyrhynchus]). Collective building, drainage, and artisanal projects have been posited for Roman Britain, along with careful, if speculative, reconstructions of the implications of these projects for collective labor inputs and communal organization (McCarthy 2013:101–16). Taken together, these various, broadly contemporaneous, points of comparison are suggestive in the present context.

At Case Nuove, the construction of two presses, particularly with mortared construction and *opus signinum* lining, would have represented a significant investment for rural communities who, at least in this region, used mortared construction only infrequently in their domestic buildings. Such specialized equipment was only necessary during the two harvests, making shared investment even more attractive. Most assessments of Roman landholding assume that large and small landowners alike held diverse land parcels, often separated by significant distances, on which were grown diverse crops suitable to micro-local conditions (Neeve 1984:128–130; Garnsey 1988:48–49; Vera 1992; Horden and Purcell 2000:77–79). Most farmers would need to carry their crops at least a certain distance for processing. A centralized, collective processing would permit maximum use, while its panoptical position on a hilltop would permit it to be monitored by all. The finds from the late Republican dump—which included some small quantities of dining wares, as well as the limited faunal remains of small meals—suggest drinking and dining that would have accompanied moments of shared activity. As is suggested by the richer textual environments of Syria and North Africa, pressing and harvest gatherings like these might also be moments of exchange and/or competition (Brown 1971; Grey 2011; Shaw 2013).

The influence of Santa Marta over Case Nuove is far less ambiguous after the press is abandoned during the Augustan/Tiberian period. New excavations in the villa suggest that it was approximately at this moment that the agricultural component of Santa Marta was abandoned and the site transformed into a luxurious rural residence. The materials from the abandonment levels at the Case Nuove pressing site provide ample documentation for this villa's influence. The increased numbers of fine wares, the amphorae from Tunisia and the East, and the diet of young animals attested in the abandonment phases, the cistern, and even the late antique square pit, all suggest that whomever was visiting or using the site in these periods had a wealthier diet and access to broadened trade connections—factors almost certainly catalyzed by the villa itself. It is possible these occupants were villa denizens; it is also possible they were the same local tenants or smaller landowners who used the presses in the late Republican period, but who now benefited from trade and husbandry patterns generated by the villa, a kind of micro-local corona of preferential access. Only further excavations of Augustan-period sites in the villa's vicinity can determine the validity of this latter hypothesis.

The function and locale of Case Nuove in its later phases shows some remarkable similarities with its late Republican functions. While no longer used as a press site, there is suggestive evidence that the site continued to be used for agro-processing for nearby communities. The fills from the large square cut contained significant domestic rubbish, pointing to the continued use of the site or its surrounds. In these were found significant concentrations of cereals pollen, as well as a few fragments of chaff, grape and olive pips/endocarps. Additionally, a small stone hand-mill was found in these same contexts. These sets of evidence, particularly the botanical remains, suggest the site was used for the winnowing and possibly the threshing and grinding of cereals during late antiquity. The site's high position and exposure to near-constant winds make the former function a natural one. Grapes and olives may also have been gathered or stored here, but there is no evidence for their processing.

In this phase, the pollen evidence suggests that the crops transported to the site, namely grain, were seemingly grown nearby. As the only site in the locale still occupied in late antiquity was the nearby site of Santa Marta, it would seem most likely that the site's users came from there. The villa remained a large luxurious residence in this period, with a set of ever-changing and expanding baths. It has been hypothesized that the baths were even intended for travelers on one of the N/S to E/W routes that ran near the site and near whose intersection lies both Santa Marta and Case Nuove (Vaccaro pers. comm.). Thus, the grain threshers of Case Nuove could have been either the denizens of Santa Marta or again, persons from further away. It is perhaps significant in this regard that the only coins from Case Nuove—albeit very low denomination *nummi*—were found in these same contexts, pointing perhaps to some low-value exchange taking place around the threshing activities.

NOTES:

5.1 Portions of this chapter are modified from Vaccaro et al. (2013). Thanks to the British School in Rome for permission to reuse some sections of that publication.

5.2 After identification, the site was subject to a total collection of all ceramic and small finds (11 total diagnostic sherds): representative samples of tile were collected. Visibility was rated 3=excellent.

5.3 The samples were studied by the Equip de Recerca Arqueològica i Arqueomètrica, Universitat de Barcelona (ERAAUB) with a Thermo Scientific TS GC ultra, with a 30 m x 0.25 mm (i.d.) x 0.25 μm film thickness fused silica capillary column and a mass spectrometer Thermo Scientific ITQ 900 operated in electronic ionization mode (70 eV). The total lipid extract and its hydrolisis were obtained following the procedure described by Hazel Mottram and her colleagues (1999). For the identification of wine markers, a method of analysis proposed by Alessandra Pecci and her colleagues (2013) was used. All the extracts were derivatized adding 25μl of N,O-bis(trimethylsilyl)trifluoroacetamide (BSTFA, Sigma-Aldrich) and heating at 70°C for 1h. As for details on the method of analysis used see Pecci et al. (2013).

5.4 (LTL5065A: 650BP±45 (δ13C -22.9±0.3); LTL5066A: 636BP±45 (δ 13C 23.9±0.3). AMS dating was performed by CEDAD, Università del Salento.

5.5 A detailed analysis of these assemblages and their implications for the analysis of Roman rural economies is found in Vaccaro and MacKinnon (2014).

5.6 Ca-Fe-rich oxidized clay matrix. Inclusions: angular, moderately abundant, moderately sorted (<0.5 mm), composed of quartz, mica (in groundmass), feldspar grains, calcareous microfossils (foraminifera, rare echinoid radioles), acid metamorphite, subordinate chert, limestone fragments, limonitic nodules.

5.7 Tunisian and Portuguese amphorae were only documented by wall sherds therefore they do not show up in Table 8, as the MNI there only takes into consideration diagnostic sherds such as rims, bases, and handles (RBH).

5.8 Dated as Upper Miocene on the CARG 10k geological maps of the Regione Toscana, and as Pliocene on the 100k geological map sheet 128 of the Servizio Geologico d'Italia

5.9 Where cinig_slope = slopes in percentage; sm_rivers_sw = small rivers weighted; me_rivers_sw = medium rivers weighted; and mj_rivers_sw = major rivers weighted.

5.10 Digital version from http://www.regione.toscana.it/regione/export/RT/sito-RT/Contenuti/sezioni/territorio/cartografia/rubriche/piani_progetti/visualizza_asset.html_44161691.html

5.11 This is an uncommon issue. The flan is worn but various elements, including the absence of the "SC" in the central field and in its place the image of a head, suggest that the example may be part of those series of asses with the head of Numa Pompilius (cf. RIC I^2, 71).

5.12 It is difficult to arrive at a minimum count for these strips; the value in the database is the sum of the individual records.

6

San Martino

6.1 Situation (AA, MG)

San Martino (altitude about 125 m asl) is located in the northern part of the township, to the south of Borgo Santa Rita (Fig. 6.1). It lies upon a gentle slope in a rolling landscape of Mio-Pliocene clays running down to the level of the intermediate terrace of the Orcia-Ombrone river system. Nearby lies the Fosso Vallanzo, a minor tributary of the Orcia River.

6.2 Remote Sensing (MG)

The site was discovered during field survey in 2008 (Ghisleni 2010). Surface materials (TU 430) consisted of a 20 x 25 m scatter of tiles, a few sherds of domestic ceramics, including Black glazed ware, Italic sigillata, and dolia fragments in a density of 0–3 sherds/m^2. From this data, the site was identified as a single-family house or small farm (Fig 6.2).

Geophysical analysis was carried out prior to excavation over a 35 x 50 m grid. Aside from a large anomaly in the northern part of the grid representing a modern cement power pole, and two other signals whose strength and circular shape suggest modern metal debris, possible archaeological responses were very weak. Only a small collection of low-level anomalies in what emerged as the building's SE corner may have been archaeological in origin.

6.3 Excavation (KB)

Because the area was under grain cultivation and in order to pose minimal disturbance to the crop, only the areas that produced geophysical anomalies and exhibited the strongest concentration of surface remains were excavated. Trial trenches were later extended to the S, E, and W, revealing no further living levels. It seems likely that the entire site was excavated, although further trial trenches would have to be extended to the N to be certain.

Topsoil was removed with a mechanical excavator and was found to overlay abandonment levels at only ca. 0.40 m from surface, and, in places, atop the walls themselves. The displacement of the south end of the W wall, and the absence of large sections of the E wall, were attributed to plow damage. The building's beaten earth floor was missing in its southern entirety, but partially preserved in the N. Nonetheless, make-up levels, one buttressing trench, and other features were found preserved.

The excavations revealed a roughly square building, measuring 7.2 x 6.5 m (Figs. 6.3–6.5) The building site was first leveled up (SU 4003/4006=4008), and the stones of the walls partially set into the leveling

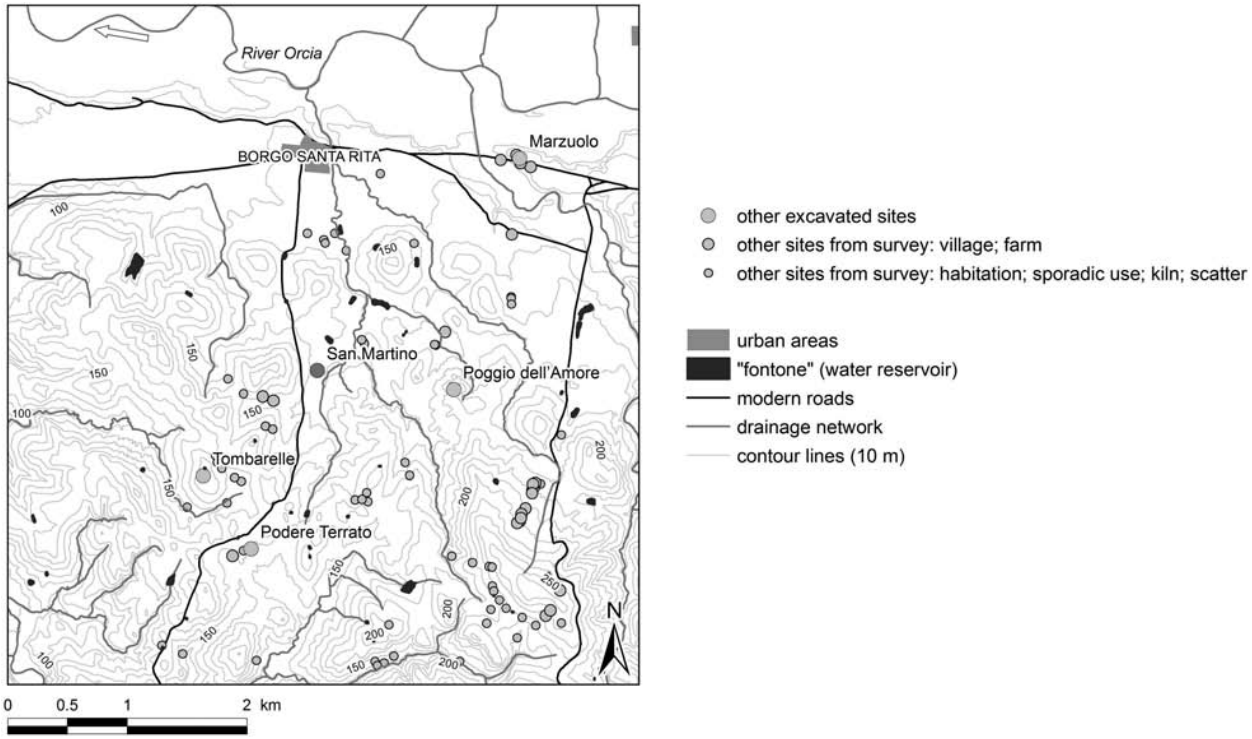


Fig. 6.1 San Martino, general topography and Roman sites (AA).

layer. These walls were nowhere completely straight, nor were either of the two preserved corners right angles (in part due to the above mentioned-plow damage, in part owing to the original construction). These walls were composed of a variety of unshaped limestone and other kinds of stone (see below, Building Materials). A cut against the W wall (SU 4009/4005) that contained a small, but well-preserved collection of ceramics may have contained a buttressing pole, against which rubbish was thrown to fill in the hole. The absence of large quantities of stone in the topsoil or abandonment levels suggest that the walls were originally composed of clay pisé, set over a stone socle, only the latter of which is preserved. Quantities of small, abraded roof tile fragments were recovered from topsoil (see below, Ceramics).

In the northeast corner, segments of a beaten earth floor were preserved (SU 4018), which extended out a 50 cm opening in the N wall (SU 4034). This opening seems to have been the building's only door. Outside the building to the S, a second, fragmentary hardened surface of gravel was found, running parallel to the S wall (SU 4030). This was identified as a drip edge, used to catch the water running off the roof and prevent the adjacent soil from being eroded. As this drip edge was identified only on the S wall, and given what appears to be the very rudimentary construction of the whole building and the location of the probable door to the N, we hypothesized a single-pitch roof, running down from N to S (see Fig. 6.12).

Inside the building, a variety of make-up levels and other contexts were identified, but none could be clearly classified as installations. A U-shaped cluster of stones (SU 4037) set in the doorway framing a rectangular cut (SU 4032) may have been a secondary installation set into the doorway. In the center, a series of darker clay in-fills were located (SU 4025, 4033); tentatively interpreted as the fragmentary remains of a hearth; charcoal analysis (see below) identified particularly large microscopic remains in this area. However, these areas lacked clear edges and could alternatively been patches to the now-destroyed floor. Other similar levels were located outside the building to the W (SU 4036/4023–4), but insufficient finds and no clear edges led us to conclude that these likewise represented in-fills to dips in the natural clay, possibly made to level up the surrounding yard.

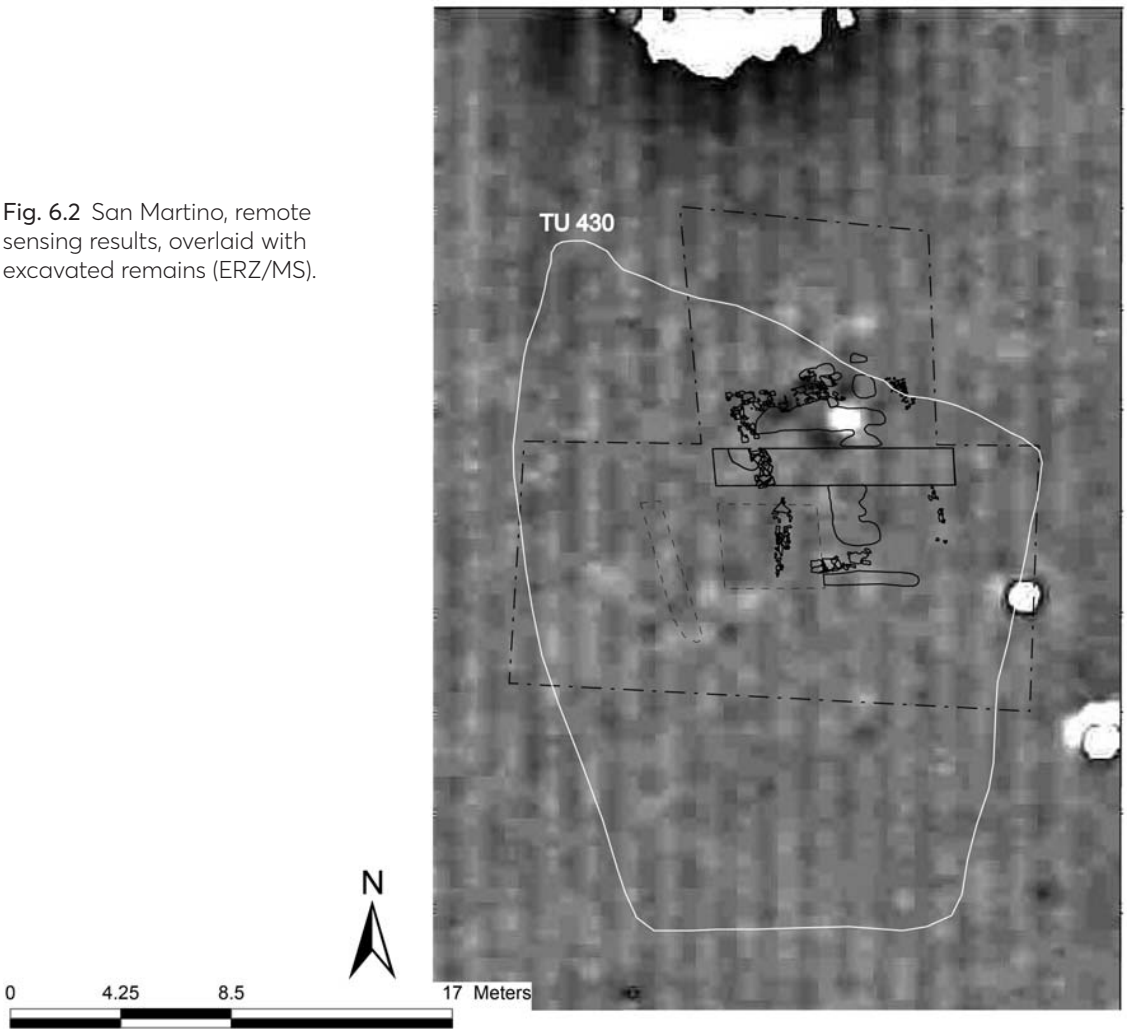


Fig. 6.2 San Martino, remote sensing results, overlaid with excavated remains (ERZ/MS).

6.4 Chronology (EV)

A comparison of two leveling layers (SU 4003, 4008) on which the western wall/foundation of the structure is built, with two occupation fills (SU 4005, 4025), suggests a consistent 2nd to mid-1st c. BC construction and occupation (Table 6.1). SU 4008 yielded a fragment of a Black glazed bowl Morel Series 2653 (see Fig. 6.6.3), dated between the 2nd and mid 1st c. BC. The fill SU 4005 produced a small bowl Morel Series 2614, typical of the 2nd c. BC (see Fig. 6.6.2). Likewise, both leveling layers (SU 4003, 4008) as well as occupation fills (SU 4025) yielded the same type of cooking pot with thickened and triangular rim from both kind of contexts (see Fig. 6.6.10–11). This data, although limited, seems to reveal that the establishment and main occupation of the site took place sometime between the 2nd and mid 1st centuries BC. The ceramics alone do not permit a more precise date, nor do they reveal whether the site was used throughout this period or for a shorter period: the absence of complex, deep stratigraphy as well as the minimal evidence for modifications would suggest the later. Some scanty evidence exists for slightly later use and/or abandonment appears in topsoil contexts (SU 4000, 4001, 4002 and 4022), which yielded the only Italic sigillata (see Fig. 6.6.4) from the site as well as some Experimental sigillata (see Fig. 6.6.5), pointing to intermittent use or reuse of the building during the second half of the 1st c. BC, after its main Late Republican phase of construction and utilization.

Fig. 6.3 Aerial view of San Martino, taken with kite (Photo by Paolo Nannini, reproduced by kind courtesy of the Soprintendenza per i Beni Archeologici della Toscana) (PN).

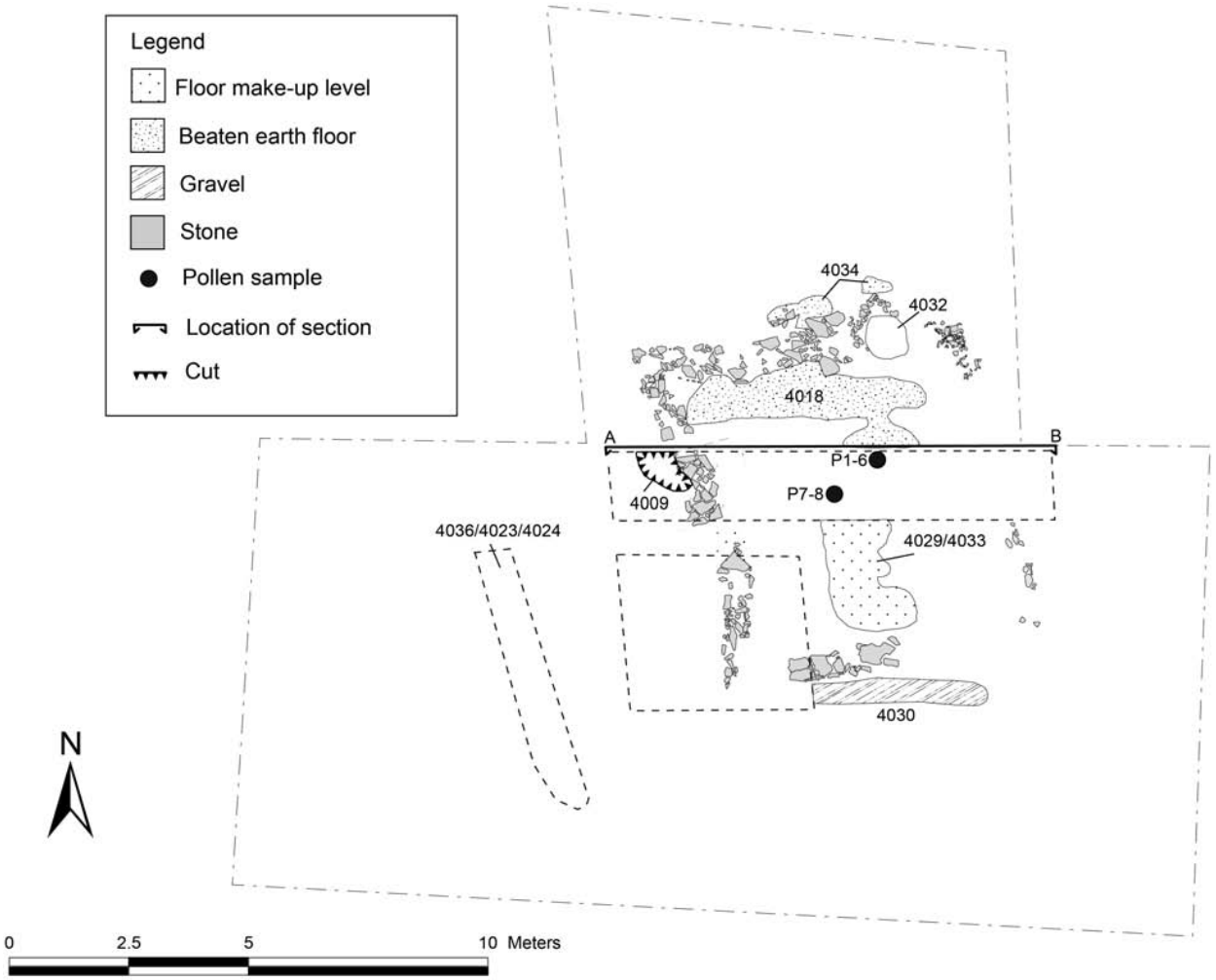


Fig. 6.4 San Martino, overall site plan (ERZ/MS).

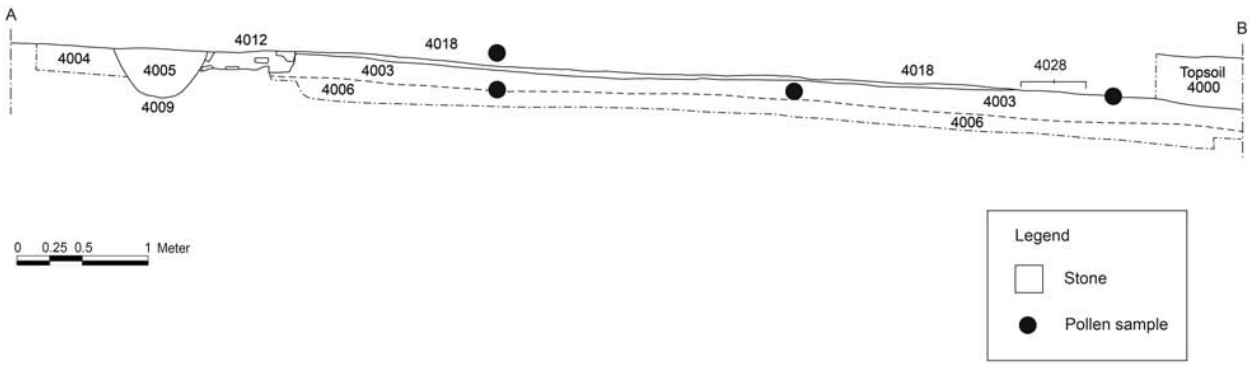


Fig. 6.5 San Martino, section, also showing location of pollen samples (ERZ/MS).

Table 6.1 San Martino, major excavated contexts with diagnostic ceramics/dates (EV).

Context	Chronological Information: Pottery	Total MNI	Possible date	Reliability
4000	BGW: pyxides Morel Series 7544 (2 MNI); dish Morel Series 2254; Italic sigillata: chalice fragment mid to late Augustan; CW: balsamarium of the 1st century BC; Amphorae: Dressel 1 (1 MNI) Thin Wall small pot comparable (1 MNI).	18	2nd/1st BC to early 1st AD, but with much higher concentration of materials in the 2nd/1st BC.	Poor: contact with plow soil
4001	Experimental sigillata: open form (1 MNI); Italic sigillata dish (1 MNI)	3	Last decades of the 1st BC to early 1st AD(?)	Poor: small MNI
4002	Italic sigillata: dish Consp. 3	1	Early to mid 1st AD(?)	Poor: small MNI
4003	BGW: generic base of a generic 2nd to 1st BC date; KW: pot	5	2nd/1st BC(?)	Good
4004	Amphora: regional early Roman amphora (1 MNI)	1	Early Roman	Poor: small MNI
4005	BGW: bowl Morel Series 2614 (1 MNI)	4	2nd BC(?)	Poor: small MNI
4008	BGW: bowl Morel Series 2653 (1 MNI); KW pot (1 MNI)	4	2nd/1st BC	Poor: small MNI (but absence of IT SIG noteworthy)
4010	KW pot (2nd to 1st BC)	1	2nd to 1st BC(??)	Poor: small MNI
4022	Italic sigillata: dish (1 MNI); Experimental sigillata dish (1 MNI)	4	Late 1st BC to early 1st AD(??)	Good
4025	KW pots (2 MNI)	4	2nd/1st BC	Medium
4026	KW pots (1 MNI)	2	2nd/1st BC(??)	Poor: small MNI

6.5 Ceramics (EV)

The excavation at San Martino yielded a low number of ceramic fragments accounting for just 343 sherds, 326 from stratified contexts, yielding an MNI of 47, and only 29 from stratified contexts (Tables 6.2 and 6.3, Fig. 6.6). None of the excavated contexts yielded either the quantities or state of preservation suitable for an in-depth quantitative analysis.

Despite the tiny quantities, the site boasted some 10 different ceramic classes, in 20 different forms. Unusually among our sites, kitchen wares are the predominant class (38.29%), followed by fine wares, namely Black glazed (17.2%) and a small quantity of Italic sigillata (8.5%). Black glazed bowls and cups are found in Morel series 2614 (Fig. 6.6.2), 2653 (Fig. 6.6.3), as well as 2 MNI of pyxides Morel series 7544, while 4 MNI of Italic sigillata included a chalice in Conspectus R2.1, a bowl or dish in Conspectus 3, and two unidentifiable fragments (Fig. 6.6.4). Two MNI of Experimental sigillata were found via thin section to *not* derive from Marzuolo (Fig. 6.6.5; see Ch. 10). A small fragment of coarse ware balsamarium or unguentarium, internally coated, presumably contained oily substances of some value, highlights the formal and functional diversity of these assemblages.

The abundance of kitchen wares (38.29%) are dominated by pots (25.53%) including some examples with a triangular rim typical of the 2nd/1st c. BC (Fig. 6.6.10–11), both made in a spathic calcite-rich fabric, which, as noted in Chapter 5 above, is particularly resistant to thermal shocks. Unusually for sites of this period is the almost total lack of open formed cooking vessels except a single MNI of a cooking bowl. With exception of a handle of a possible Tyrrhenian Dressel 1, amphorae (8.51%) consist entirely of local/regional types (e.g., Fig. 6.6.9). A single MNI of a dolium (Fig. 6.6.14) points to some kind of storage on site. Finally, the presence of one loom weight (Fig. 6.6.13) is worthy of note as it shows that other, non-farming activities like spinning were carried out at the site. However, the fact that only one was found could also suggest it was reused as building material.

A tally was made of the tile fragments found in both topsoil and stratified contexts (Table 6.4). It should be noted that the topsoil contexts only

Table 6.2 San Martino, ceramic classes by MNI and % of MNI diagnostics (EV).

Ware	San Martino (85 diagnostics/47 MNI)
BGW	8 or 17.2%
Italic sigillata	4 or 8.5%
Thin walls	1 or 2.12%
Experimental sigillata	2 or 4.25%
ARS	0 or 0%
Color-coated ware	0 or 0%
SCT	0 or 0%
Late Italic sigillata	0 or 0%
Coarse ware	5 or 10.63%
Kitchen ware	18 or 38.29%
Tunisian kitchen ware	0 or 0%
Amphorae	3 or 6.28%
Coarse ware/amphorae	2 or 4.25%
VRI	0 or 0%
Dolia	3 or 6.28%
Lamps	0 or 0%
Loomweights	1 or 2.12%
Amphora stopper	0 or 0%
Other ware (*tubuli*? and kiln spacers)	0 or 0%
Thin walls/coarse ware	0 or 0%
Color-coated ware/coarse ware	0 or 0%

Table 6.3 San Martino, ceramic forms/functions by MNI and % of MNI diagnostics (EV).

FORMS	San Martino (85 diagnostics/47 MNI)
KITCHEN (includes KW and VRI)	**18 or 38%**
Generic closed forms for kitchen	0
Cooking pots	12 or 25.53%
Cooking jugs	0
Generic open forms for kitchen	0
Casseroles	0
Cooking bowls	1 or 2.12%
Frying pans/*tegami*	0
Bread-baking pans/*testi*	0
Clibani	0
Cooking lids	5 or 10.63%

Table 6.3 cont'd San Martino, ceramic forms/functions by MNI and % of MNI diagnostics (EV).

FORMS	San Martino (85 diagnostics/47 MNI)
DINING/STORING (includes CW, FW and CCW)	**21 or 44.68%**
Generic closed forms for table and storage	0
Jugs	1 or 2.12%
Jars	1 or 2.12%
Jugs/jars	0
Beakers	1 or 2.12%
Small table pot	3 or 6.38%
Bottles	1 or 2.12%
Flasks	0
Chalice	1 or 2.12%
Flanged-Bowls	0
Generic opens forms for table	1 or 2.12%
Bowls	1 or 2.12%
Cups	3 or 6.38%
Dishes	6 or 12.76%
Bowls/Dishes	1 or 2.12%
Basins	1 or 2.12%
Lids	0
Small vessels for sauces or perfumes(?)	0
Uncertain (food processing?)	0
Mortaria	0
TRANSPORT and STORAGE	**6 or 12.76%**
Amphora stoppers	0
Amphorae	4 or 8.51%
Dolia	1 or 2.12%
Table amph/jar	1 or 2.12%
LIGHTING	**0**
Lamps	0
OTHER "FUNCTIONAL" CERAMICS	**1 or 2.12%**
Loomweights	1 or 2.12%
Drains	0
Unguentaria	1 or 2.12%
Kiln spacers	0
Molds	0
Tubuli	0
RESIDUALS	**0**
UNCERTAIN	**0**

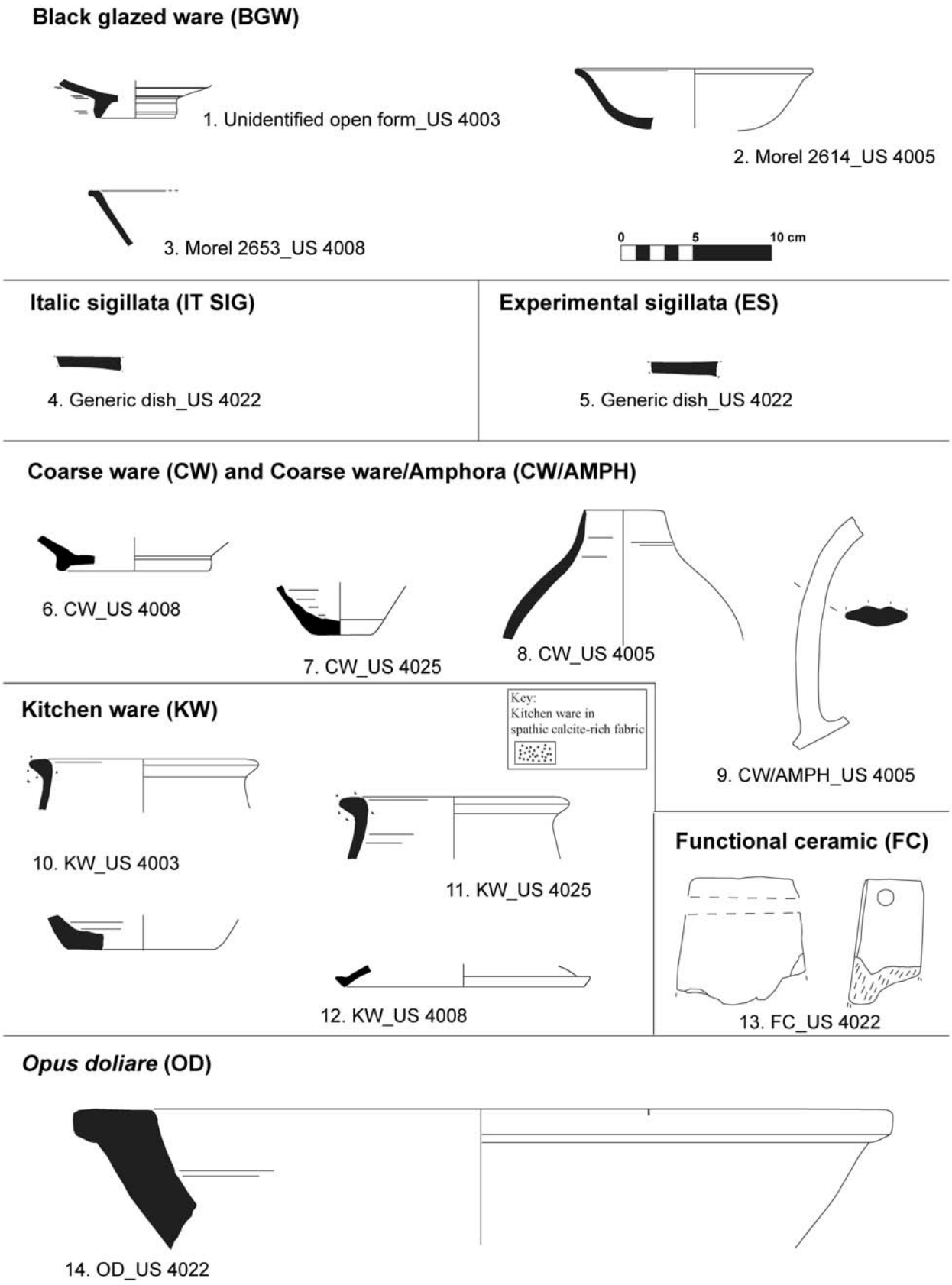


Fig. 6.6 San Martino, representative diagnostic ceramics from US 4003, 4005, 4008, 4022, 4025. Black glazed ware (BGW): 1. Unidentified open form; 2. Bowl Morel 2614; 3. Bowl Morel 2653. Italic sigillata (IT SIG): 4. Unidentified dish. Experimental sigillata (ES): 5. Unidentified dish. Coarse ware (CW) and Coarse ware/Amphora (CW/AMPH): 6–8. Jugs; 9. Small amphora or large jug. Kitchen ware (KW): 10–11. Cooking pots; 12. Lid. Functional ceramic (FC): 13. Loomweight. *Opus doliare*: 14. Mortarium (EV).

Table 6.4 San Martino, tile fragments, forms, weights and quantities (EV).

Context	Tile Fragments	Tile Weight (g)	Imbrices Fragments	Imbrices Weight (g)	Unid. Fragments	Weight (g)	Total Fragments	Total Weight (g)
4017					3	55	3	55
4002	5	1100	6	135			11	1235
4000	1	850					1	2140
4001	3	495	6	245			9	740
4018	1	125					1	125
4020					2	65	2	65
4035	1	120					1	120
4019	3	340					3	340
4023	7	560	6	555	9	250	22	1365
4005	6	1045	14	215	4	205	24	1465
4007	2	115	1	180	1	65	4	360
4022	3	3025	2	65			5	3090
4003	6	725	6	410	3	45	15	1180
4011			1	5			1	5
4024	7	1205	4	425	27	615	38	2245
4025	3	450			1	35	4	485
4026			2	185	1	75	3	260
4008	4	715	6	790			10	1505
4033	2	160	3	415			5	575
4027	1	120	1	55			164	175
TOTAL	**55**	**11150**	**58**	**3680**	**51**	**1410**	**326**	**17530**

include those documented after mechanical removal. While no whole and very few large fragments were recorded during the course of excavation, the cumulative total—326 tile and *imbrex* fragments weighing 17.5 kg—is significant. Thus, our original supposition and reconstruction of the structure with a straw roof (see Fig. 6.12 and color insert) may merit reconsideration.

6.6 Faunal Materials (MM)

Zooarchaeological materials from San Martino were extremely scarce (Table 6.5). Similar to the ceramics, marked taphonomic and post-depositional erosion, abrasion, split-line fracturing, crushing, breakage, and destruction was evident on the faunal materials. Bones were absent from all of the upper levels; faunal materials were restricted to contexts (SU 4018, 4025, 4027) associated exclusively with construction and principal use of the site.

Only two finds comprise the NISP component for the sample. The first of these is a proximal fragment of a cattle second phalanx, which displayed chop marks across its upper margin, probably a result of disarticulation of the foot in carcass processing. This was an adult individual, of somewhat smaller stature than typical cattle from the wider region; perhaps it derives from a cow, although this cannot be confirmed concretely. The second NISP piece is a fragment of a third mandibular molar tooth of a pig. The tooth exhibits minimal wear, suggesting a younger age; its size corresponds to average dimensions for typical pigs in the region overall. In addition to these

Table 6.5 San Martino, faunal remains (MM).

	San Martino (SU 4018, 4025, 4027)	
	Count	Weight (g)
Cattle (*Bos taurus*)	1	6
Pig (*Sus scrofa* dom.)	1	5
Long bone fragment (medium-sized mammal, cf. pig)	2	5
Long bone fragment (large-sized mammal, cf. cattle)	4	32
TOTAL	**8**	**48**

two NISP elements, two small scraps of long bone pieces from medium-sized taxa (cf. pig) and four unidentifiable long bone fragments from a larger taxon (cf. cattle) were recorded. Given the high degree of taphonomic disturbance, exposure, and breakage among the faunal elements recovered, it seems that very little of this entire faunal assemblage from San Martino derives from primary deposition. Most, if not all, appears to be secondary trash. Thus, caution is warranted in extrapolating from such piecemeal secondary remains.

6.7 Land Units and Evaluation (MM)

The land unit study carried out for the area around San Martino (Color Fig. 6.7) revealed a landscape seemingly well adapted for agriculture. This evaluation presumes that fine textured (clayey) soils are more suitable for cereal and fodder production than coarser textured soils, due to their higher natural fertility (Fig. 6.8, hypothesis I). As discussed in Chapter 2 above and further in Chapter 6, this interpretation may be made more complicated by the difficulty of plowing heavy, clayey soil with low-technology tools, like a wooden plow. This consideration influences the land evaluation and may indicate less suitability for the area than one might suppose (Fig. 6.9, hypothesis II). The San Martino locale has also a dominant high suitability for pasture, because of the high water retention capacity of the clays and of the richness in natural water outflows, now mostly converted into water reservoirs ("*fontoni*") (see Fig. 6.1).

6.8 Botanical Materials (AA, ER, ERR)

A total of eight pollen samples and two samples for macroremains were collected and treated (Tables 6.6–6.8). Pollen samples were taken from two different points: inside the structure (six samples from SU 4006, 4033) and outside the structure (two samples from "near-site" deposits) (see Fig. 6.4). Soil from SU 4005 and 4033 were subject to flotation and macroremain study.

A total of 4,345 pollen grains (ca. 550 p/sample), 7,285 NPPs, 1,188 microcharcoals, and 51 seeds/fruits were counted (Table 6.6). Concentrations of on-site pollen were variable but on average quite high (ca. 47,436 p/g) while near-site samples showed very low concentrations (6,804 p/g). The samples from San Martino contain pollen with different levels of preservation including some well-preserved pollen grains: this possibly means that pollen from diverse origins was incorporated in the sediment, and that part of these pollen grains were neither strongly pressed nor reworked.

Landscape and woodland composition: Pollen diversity was relatively high, with 37 to 51 taxa per sample, suggesting a landscape in which human intervention did not markedly reduce species diversity. Arboreal/Non-Arboreal pollen ratio (AP/NAP) was 15/85 inside the site and 20/80 near-site, both suggesting that woodlands were not proximate to the site. In fact, the low percentages of forest cover suggest that the landscape was open and trees or shrubs lived fairly far from the site. Possibly a puzzle of shrubs, including *Corylus*, *Helianthemum*, and *Rubus* type, and open areas were distributed in the surrounding zone.

Mediterranean species are low (1%), as well as trees living at higher elevations (*Abies* 1%, *Picea* 0.2%, and *Fagus* 0.1%). Woods were prevalently oak woods (deciduous *Quercus* 3.8%) with some pines (*Pinus* 5.6%). The hygrophilous woods, however, may have also been closer than the oak woods, with alder (*Alnus* 2.0%) and some willows (*Salix* 0.2%) living on edges of wetlands.

Wet environments: Wetland plants were fairly extensive (4.2%), unsurprising given the presence of the nearby Fosso Vallanzo. Besides the trees mentioned above (*Alnus* and *Salix*), there were helophytes (*Typha/Sparganium, Phragmites australis* cf.) and

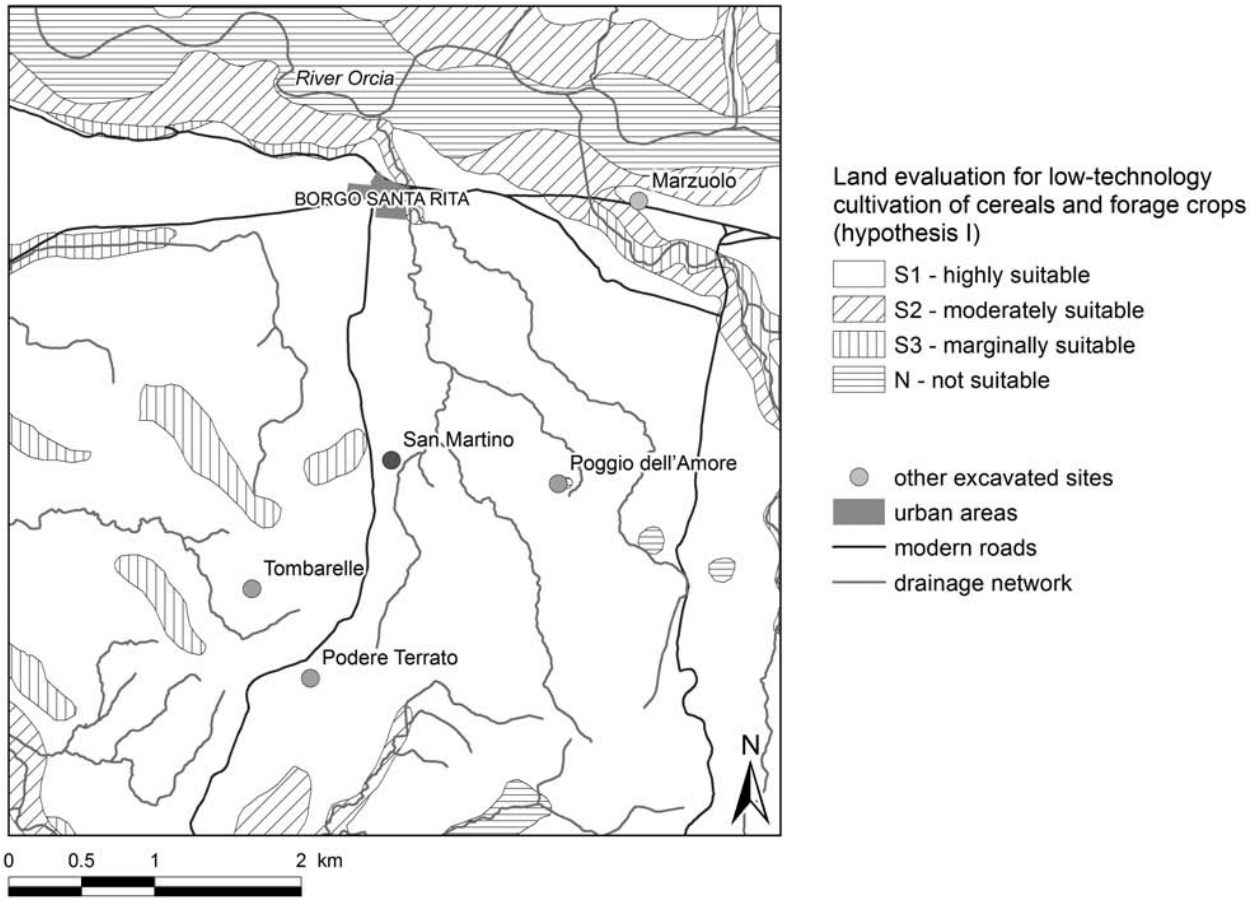


Fig. 6.8 San Martino locale, land evaluation map, hypothesis I (AA).

aquatic species needing permanent water *(Lemna, Potamogeton, Nuphar, Nymphaea* cf. *alba, Sagittaria*, *Myriophyllum verticillatum*). Moreover, the algae of different types found in these samples are further evidence of the presence of freshwater in the area.

Cereal fields: Pollen of cereals is low but significant in these spectra (1.4% on average) suggesting that the fields were present but not in the vicinity of the site. Because cereal pollen is large, it is not easily transported by air over long distances and it is rarely found far from fields. Several types were distinguished: (a) *Avena/Triticum* group that includes cultivated oat and various species of wheat; some grains may be attributed to *Triticum*, included in the previous group but more similar to the bread and durum wheats; (b) *Hordeum* group that includes cultivated barley and some wild species; (c) Cerealia undiff. that includes folded-crumpled grains that cannot be ascribed to the previous types.

Interestingly, the cereal pollen concentration is a bit higher outside (1.9%) than inside (1.3%) the building—again in keeping with the difficult wind-borne transport of cereal pollen. In agreement with the absence of cereal grains in the macroremain record (see below), this also suggests that cereals were not transported or accumulated in the structure (Booth and Richards 1978; Behre 1986).

Cultivated woody plants: Tree crops in the area were quite distant, limited to a few olive trees. The very low percentage and frequency of *Olea* pollen (<1%), commonly showing only about 2–6% even 500–1,000 m from the groves themselves (Florenzano, Benassi, and Mercuri 2012; Florenzano et al. 2017), suggests that this plant was distant from San Martino. Possibly some Rosaceae trees, such as *Sorbus*, or other entomophilous plants were grown for fruits near the site but they are low pollen-producers and are difficult to locate. Hazelnuts (*Corylus*) and

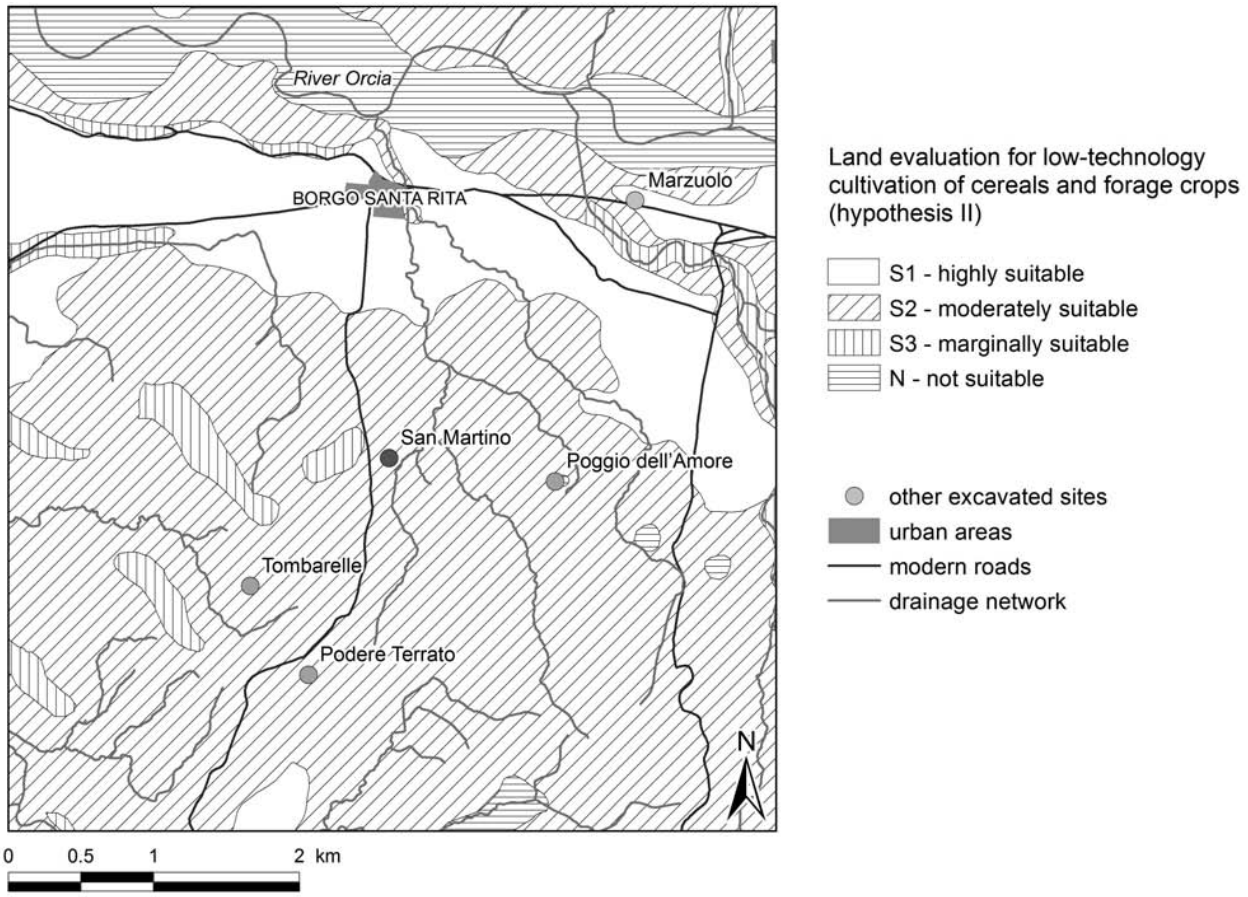


Fig. 6.9 San Martino locale, land evaluation map, hypothesis II (AA).

blackberry bushes (*Rubus* type) were probably collected in the wild from shrubs living in the woods.

Pastures and fodder: Pasture indicators are the most significant presence in the pollen spectra and they are the most important component of the landscape around the site. A number of pollen taxa in the spectra refer to the presence of pastures or to practices of animal foraging.

The LPPI are high (52% of the pollen spectrum of the intra-site samples and 43% near-site) and include Asteroideae (including *Aster* type, *Carduus, Centaurea nigra* type) and Cichorieae, *Ranunculus* type and Ranunculaceae indiff., *Galium* type. Together these species reflect practices of breeding and presence of grazing areas (Behre 1986; Hjelle 1999; Mercuri et al. 2010).[1]

Legumes such as *Dorycnium, Lotus, Hedysarum, Trifolium* and other Fabaceae indiff., together with part of the Poaceae-wild group pollen also appear in important numbers and include species that may be cultivated for fodder. At 5.8%, fodder species are the highest anywhere in the project. Other herbs are common in pastures or in abandoned fields that can be browsed (Brassicaceae, Caryophyllaceae, etc.) and represent lands that may have been used as grazing areas.

Non-Pollen Palynomorphs

Spores and hyphas of fungi, spores and other elements of algae and zoomicroremains were found in all samples, predominantly in the in-site samples (Table 6.7). This data provided particularly important information on the function of the site.

Fungi (22 morphotypes plus some undifferentiated spores) amounted to ca. 6,500 NPP/g on average in the intra-site samples (P1–P6) while the near-site samples are six times lower on average (ca.1,200

Table 6.6 San Martino, pollen analysis (AMM/ER).

SAN MARTINO Percentage pollen spectra													
Sample (SM)			***P1***	***P2***	***P3***	***P4***	***P5***	***P6***	***P7***	***P8***	***Mean (inside structure)***	***Mean (near-site)***	***Mean pollen spectrum***
Stratigraphic Unit			4033				4006		(near-site)				
Depth (cm)			3	25	27.5	27.5	36	37.5	25	45			
Pollen concentration (p/g)			**42576**	**39700**	**16177**	**128197**	**45562**	**12405**	**6588**	**7019**			
BETULACEAE	*Alnus*	Wt	1.5	3.2	2.1	1.7	1.4	2.1	2.1	2.3	2.0	2.2	2.0
	Betula		0.7					0.9			0.3		0.2
	Carpinus betulus	Ow							0.2			0.1	0.02
	Corylus	Ow	1.8	1.1	1.2	0.4	1.0	1.1	0.2	1.7	1.1	1.0	1.0
	Ostrya/Carpinus orientalis	Ow		0.4			1.0	1.1		0.2	0.4	0.1	0.3
CISTACEAE	*Helianthemum*							0.9			0.1		0.1
	Cistus							1.2			0.2		0.2
CUPRESSACEAE	*Juniperus* type	Md			1.0						0.2		0.1
ERICACEAE	*Erica arborea* cf.	Md	0.8	1.2		0.8	1.7		0.6	1.5	0.8	1.0	0.8
FAGACEAE	*Fagus*		0.3	0.2			0.4				0.1		0.1
	Quercus deciduous	Ow	2.5	4.4	3.5	5.6	3.7	3.0	4.0	3.4	3.8	3.7	3.8
MALVACEAE	*Tilia*	Ow	0.2	0.5						0.4	0.1	0.2	0.1
OLEACEAE	*Fraxinus excelsior* type	Ow							0.2			0.1	0.02
	Olea europaea	Md			0.2					0.2	0.03	0.1	0.05
PINACEAE	*Abies*		0.2	1.8		0.4	1.4	1.4	2.4	0.6	0.8	1.5	1.0
	Picea			0.4					0.9		0.1	0.5	0.2
	Pinus		4.7	4.6	3.3	4.6	5.4	4.6	8.9	9.0	4.5	8.9	5.6
ROSACEAE	*Rubus* type							0.5			0.1		0.1
	Sorbus							0.4			0.1		0.04
SALICACEAE	*Salix*	Wt	0.2	0.2			0.6	0.2	0.4		0.2	0.2	0.2
ALISMATACEAE	*Sagittaria*	Wh	0.2	0.4			0.2	0.4	0.6	0.2	0.2	0.4	0.2
ALLIACEAE	*Allium*		0.2	0.5	0.4	1.0	1.4		0.6	1.0	0.6	0.8	0.6
AMARANTHACEAE	Chenopodiaceae indiff.		0.8	0.2	1.4	1.5		0.9	1.5	0.6	0.8	1.0	0.9
	Chenopodium		0.2								0.03		0.02
APIACEAE	*Daucus* type				0.6			0.5			0.2		0.1
ARACEAE	*Lemna*	Wh		0.2				0.4			0.1		0.1
ASTERACEAE	*Ambrosia*		0.2		0.4			0.4	0.2		0.2	0.1	0.1
	Artemisia			0.2	0.2	1.4			0.4		0.3	0.2	0.3
	Aster type	LPPl	1.7	5.8	4.5	5.4	2.3	1.4	2.3	4.8	3.5	3.5	3.5
	Asteroideae indiff.	LPPl			0.4	0.4	1.0	0.5	0.4	1.0	0.4	0.7	0.4
	Carduus	LPPl		0.2				0.2			0.1		0.04
	Centaurea nigra type	LPPl	6.0	4.1	3.5	0.6	0.6	0.9	0.4	2.7	2.6	1.5	2.3
	Cichorieae	LPPl	51.2	41.1	49.2	41.9	41.3	41.6	43.3	29.5	44.4	36.4	42.4
BORAGINACEAE	Boraginaceae							0.7			0.1		0.1
BRASSICACEAE	Brassicaceae		0.8	0.9	1.4	1.5	1.0	0.2	0.8	1.5	1.0	1.1	1.0
CARYOPHYLLACEAE	Caryophyllaceae		1.2	0.7	1.6	1.2	1.2	0.9	0.2	1.3	1.1	0.8	1.0
CONVULVULACEAE	*Convolvulus*		0.3			0.4	0.4		0.9	0.6	0.2	0.8	0.3
	Cuscuta europaea				0.2						0.03		0.02
CYPERACEAE	Cyperaceae	(Wh)	0.2	1.1		1.9	0.8	1.2	0.8	1.3	0.9	1.0	0.9
DIPSACACEAE	*Knautia*							0.4			0.1		0.04
EUPHORBIACEAE	Euphorbiaceae				0.4						0.1		0.05

Table 6.6 cont'd San Martino, pollen analysis (AMM/ER).

SAN MARTINO Percentage pollen spectra													
Sample (SM)			***P1***	***P2***	***P3***	***P4***	***P5***	***P6***	***P7***	***P8***	***Mean (inside structure)***	***Mean (near-site)***	***Mean pollen spectrum***
Stratigraphic Unit			4033				4006		(near-site)				
Depth (cm)			3	25	27.5	27.5	36	37.5	25	45			
Pollen concentration (p/g)			**42576**	**39700**	**16177**	**128197**	**45562**	**12405**	**6588**	**7019**			
FABACEAE	*Astragalus*		0.2				0.2		0.2		0.1	0.1	0.1
	Dorycnium	le	0.5	0.4	1.2		1.4	3.0	0.4		1.1	0.2	0.8
	Fabaceae indiff.	le	2.5	2.3	2.1	3.9	4.8	3.0	2.4	4.0	3.1	3.2	3.1
	Hedysarum	le	0.2					0.2			0.1		0.04
	Lotus	le	0.2	0.7	0.2	0.4	0.2	0.7	0.2	0.2	0.4	0.2	0.3
	Trifolium indiff.	le	0.3	1.2	1.2	0.6	0.6	0.7	0.8	0.8	0.8	0.8	0.8
	Trifolium pratense type	le		0.4		0.2	1.0	0.7			0.4		0.3
GERANIACEAE	*Erodium*							0.7			0.1		0.1
HALORAGACEAE	*Myriophyllum verticillatum*							0.2			0.03		0.02
LAMIACEAE	Lamiaceae indiff.				0.6	0.6	0.6			1.0	0.3	0.5	0.3
	Mentha type		0.7								0.1		0.1
LILIACEAE	Liliaceae		0.3	0.5	0.4		0.2	0.2	0.4	0.2	0.3	0.3	0.3
NYMPHAEACEAE	*Nuphar*	Wh			0.6						0.1		0.1
	Nymphaea alba	Wh	0.2						0.2	0.4	0.03	0.3	0.1
PLANTAGINACEAE	*Plantago*		0.7	0.4	0.8	1.2	0.2		1.5	0.2	0.5	0.8	0.6
POACEAE	*Avena/Triticum* group	ce				1.0	1.0	0.2	0.6	1.1	0.4	0.9	0.5
	Hordeum group	ce	1.0	0.4	1.6	0.2			0.4		0.5	0.2	0.4
	Cerealia indiff.	ce	0.7	0.5		0.4	0.8		0.2	1.5	0.4	0.9	0.5
	Phragmites australis cf.	Wh	0.3	0.2		0.8	0.8				0.3		0.3
	Poaceae-wild group		12.8	15.3	10.3	16.6	15.1	10.7	14.5	19.8	13.5	17.2	14.4
POLYGONACEAE	*Polygonum persicaria* cf.		0.2								0.03		0.02
POTAMOGETONACEAE	*Potamogeton*	Wh			0.6		0.4	0.5			0.2		0.2
RANUNCULACEAE	*Helleborus*								0.6			0.3	0.1
	Ranunculus type	LPPl		1.1					0.2		0.2	0.1	0.2
	Ranunculaceae indiff.	LPPl	0.7	0.7	0.8	0.6	0.8	1.2	0.9	1.5	0.8	1.2	0.9
ROSACEAE	*Filipendula*		1.2	0.4	1.8		0.4	1.1			0.8		0.6
	Rosaceae indiff.		0.3		0.8	0.8	1.2	0.5	0.9	2.7	0.6	1.8	0.9
RUBIACEAE	*Galium* type	LPPl						0.4			0.1		0.04
SAXIFRAGACEAE	*Saxifraga* cf.				0.6	0.2	0.8	0.7	1.3	0.4	0.4	0.8	0.5
SCROPHULARIACEAE	*Euphrasia*			0.2				0.2			0.1		0.04
	Linaria type							0.5			0.1		0.1
	Scrophulariaceae indiff.		0.2	0.7			0.4			0.6	0.2	0.3	0.2
SOLANACEAE	*Solanum nigrum* type				1.0		0.6	4.0			0.9		0.7
TYPHACEAE	*Typha/Sparganium*	Wh	0.2			0.6			0.6		0.1	0.3	0.2
URTICACEAE	*Urtica dioica* type		0.5	0.4	0.2		0.6	0.2	0.6	0.8	0.3	0.7	0.4
	Urtica cf. *pilulifera*					1.0				0.8	0.2	0.4	0.2
VALERIANACEAE	*Valeriana*					0.2		0.2			0.1		0.05
Unknown/Indet.			0.8	1.4	0.2	0.4	1.9	2.8	1.3	0.6	1.3	0.9	1.2

Table 6.6 cont'd San Martino, pollen analysis (AMM/ER).

SAN MARTINO Percentage pollen spectra												
Sample (SM)		*P1*	*P2*	*P3*	*P4*	*P5*	*P6*	*P7*	*P8*	*Mean (inside structure)*	*Mean (near-site)*	*Mean pollen spectrum*
Stratigraphic Unit		4033				4006		(near-site)				
Depth (cm)		3	25	27.5	27.5	36	37.5	25	45			
Pollen concentration (p/g)		**42576**	**39700**	**16177**	**128197**	**45562**	**12405**	**6588**	**7019**			
POLLEN SUM		**602**	**567**	**514**	**518**	**518**	**570**	**531**	**525**	**548**	**528**	**543**
NUMBER OF TAXA		**46**	**43**	**39**	**37**	**42**	**51**	**44**	**39**			
SUMS												
Arboreal pollen	AP	**12.8**	**17.8**	**11.3**	**13.5**	**16.4**	**17.2**	**19.8**	**19.2**	**14.8**	**19.5**	**16.0**
Non Arboreal pollen	NAP	**87.2**	**82.2**	**88.7**	**86.5**	**83.6**	**82.8**	**80.2**	**80.8**	**85.2**	**80.5**	**84.0**
Mixed oak wood	Ow	**4.2**	**6.3**	**4.7**	**6.0**	**5.6**	**5.1**	**4.5**	**5.7**	**5.3**	**5.1**	**5.3**
Mediterranean trees/shrubs	Md	**0.8**	**1.2**	**1.2**	**0.8**	**1.7**		**0.6**	**1.7**	**1.0**	**1.1**	**1.0**
Wet environments (trees)	Wt	1.7	3.4	2.1	1.7	1.9	2.3	2.4	2.3	2.2	2.4	2.2
Wet environments (herbs)	Wh	0.8	0.7	1.2	1.4	1.4	1.4	1.3	0.6	1.1	0.9	1.1
Wet environments (Cyperaceae)	(Wh)	0.2	1.1		1.9	0.8	1.2	0.8	1.3	0.9	1.0	0.9
Wet environments	WE	**2.7**	**5.1**	**3.3**	**5.0**	**4.1**	**4.9**	**4.5**	**4.2**	**4.2**	**4.4**	**4.2**
Cerealia	ce	**1.7**	**0.9**	**1.6**	**1.5**	**1.7**	**0.2**	**1.1**	**2.7**	**1.3**	**1.9**	**1.4**
Legumes/pulses (-fodder)	le	**3.8**	**4.9**	**4.7**	**5.0**	**8.1**	**8.2**	**4.0**	**5.0**	**5.8**	**4.5**	**5.5**
LPPI (-Cich)		8.3	11.8	9.1	6.9	4.6	4.6	4.1	9.9	7.6	7.0	7.4
LPPI	LPPI	**59.5**	**52.9**	**58.4**	**48.8**	**45.9**	**46.1**	**47.5**	**39.4**	**51.9**	**43.4**	**49.8**

NPP/g). In all samples, *Glomus* (93 NPP/g on average) and Sordariaceae (108 NPP/g) are prevalent. *Sordaria* type and other Sordariaceae, and *Sporormiella* are coprophilous fungi that live on dung and are markers of presence of excrements, probably of animals. Another group of fungi belong to saprophyte genera and include *Coniochae*ta and *Valsaria*. *Tilleti*a is a pathogenic fungus that was found in some samples (P1–P4, P8), which along with *Puccinia*, can be parasitic fungi for cereals. In all samples, *Kretzschmaria deusta* (26 NPP/g) and *Chaetomium* (7 NPP/g) are indices of fires: the presence of these fungi is in agreement with that of the microcharcoal particles observed in the same slides (Vànky 1994 and see below).

Algae (6 morphotypes) concentration is decidedly higher in the intra-site samples (ca. 2,900 NPP/g on average) than in the near-site samples (380 NPP/g). All samples contain HdV181 and HdV182, living at the surface of water bodies, and *Pseudoschizae*a (92 NPP/g). The latter is frequent in seasonally dried ponds (Geel 2001). In this context, the algae may be indicators of erosional events, or local transport of silt, or even of the presence of urine in the site (Mercuri et al. 2010). The three types of algae mentioned above indicate that some, probably seasonal, freshwater ponds were present near the site. However, as algae were found to a lesser extent out rather than inside the site, it is probable that some freshwater with algae was transported into the rural building to water domestic animals kept inside.

Of parasite eggs (310 NPP/g, found only in the intra-site samples). *Trichuris* was found in P4, and *Dicrocoelium* was found in P2, P4, P5, and P6. These very interesting records are eggs of parasites of mammalians. *Dicrocoelium* includes the species *D. dendriticum* (salmon tapeworm), a parasite of ruminants (Le Bailly and Bouchet 2010).

Microcharcoals (Table 6.7): Microscopic particles of charcoals >125 μm that are indicative of local fires are found in all samples. The concentration in the intra-site samples is ca. 640 ch/g on average, while in the near-site samples is ca. 190 ch/g. A few charcoals of very large size (>300 μm) were observed

Table 6.7 San Martino, non-pollen palynomorph and microcharcoal analysis (AMM/ER).

SAN MARTINO Non-Pollen Palynomorphs and Microcharcoals									
Sample (SM)		*P1*	*P2*	*P3*	*P4*	*P5*	*P6*	*P7*	*P8*
Stratigraphic Unit		4033				4006		(near-site)	
Depth - cm		3	25	27.5	27.5	36	37.5	25	45
NON-POLLEN PALYNOMORPHS (concentration NPP/g)									
FUNGI	*Alternaria, Ascospora* (HdV18), *Chaetomium* (HdV7), *Coniochaeta lignaria* (HdV172), *Delitschia* type, *Gelasinospora, Glomus* (incl. *G. fascicolatum*), HdV124, HdV201, HdV546, *Podospora* type (HdV368), *Puccinia, Sordaria* type, *Sordariaceae* indiff., *Spegazzinia, Sporormiella, Valsaria variospora* type, *Tilletia, Trichocladium* type, *Kretzschmaria deusta* (HdV44), *Urocystis*	10229	1765	883	15512	1734	8832	365	1959
ALGAE	Desmidiales, HdV181, HdV182, HdV492, *Pseudoschizaea, Spirogyra*	8933	1450	256	2793	2334	1539	285	400
ZOOMICROREMAINS	*Dicrocoelium*, Fragments of invertebrates indiff., *Trichuris*	432	105	14	868	86	1071	7	23
	Total Concentration of classified NPPs (NPP/g)	**19594**	**3319**	**1153**	**19173**	**4154**	**11442**	**657**	**2381**
MICROCHARCOALS									
	125–200 µm (ch/g)	9	8	1	45	44	7	94	89
	201–500 µm (ch/g)	0	3	0	2	9	1	4	4
	Total Concentration of microcharcoals (ch/g)	**9**	**11**	**1**	**47**	**53**	**8**	**98**	**93**

in P6, a possible indicator of a previous hearth in this location.

Macroremains

Two samples from SU 4005 and 4033 were examined (Table 6.8). Remains were poorly preserved and highly mineralized. Though there is an interesting evidence of remains of *Ficus carica* (Fig)—an indicator of a latrine or dung—the archaeobotanical record is dominated by seeds and fruits of herbaceous plants. Wild plants largely represent ruderal environments and pasturelands. Fabaceae are of particular interest, because the genera *Hedysarum*, *Medicago, Melilotus*, and *Trifolium* include species that may have been cultivated as fodder. Thus, the results support those obtained from the palynological data. There is no evidence of plant accumulation or processing in place. This is suggested by the fact that the total number of remains is low (51 records in 11 liters), cereals are virtually absent, and the plants probably cultivated for animal fodder are most characteristic of the record.

6.9 Coins/Small Finds (SCE)

The small finds from San Martino were near absent. The site produced no glass or coins, and only 5 metal objects (weighing in total 32 g). The later consisted of three iron nails (SF 304001, 304002, and 304003, two fragmentary, one intact), as well as two fragments of irregularly shaped lead with no possible identification. All of these finds came from either the topsoil clearance (SU 4000), just below it (SU 4002), or from SU 4024, considered to be an accumulation of general debris and plow soil. Given their scarce quantity, the small finds do not contribute much to an understanding of the site's function, except to reinforce the impression of a site on the "sporadic" end of the use spectrum through their paucity.

6.10 Building Materials (AA)

The principal stones used for the structure of San Martino (Fig. 6.10) are:

Table 6.8 San Martino, macroremains analysis (AMM/RR).

SAN **MARTINO Macroremains**			
Sample (SM)		***M1***	***M2***
Stratigraphic Unit		**4005**	**4033**
Sediment volume (liters)		5	6
Ficus carica L.	achene	1	6
Fruit trees		**1**	**6**
Fabaceae indiff.	legume		1
Grains and legumes		**—**	**1**
Atriplex hortensis L.	achene		1
Vegetables s.l.		**—**	**1**
Ajuga chamaepitys (L.) Schreb.	mericarp		1
Ajuga sp.	mericarp		1
Atriplex sp.	achene	2	
Chenopodium sp.	achene	1	
Euphorbia cyparissias L.	seed	1	
Hedysarum coronarium L.	seed		1
Helminthotheca echioides (L.) Holub	achene		2
Medicago sp.	seed	4	3
Melilotus officinalis type	seed		1
Papaver somniferum L.	seed		4
Portulaca oleracea L.	seed		1
Sambucus sp.	endocarp	1	
Trifolium cf. *repens* L.	legume		1
Verbena officinalis L.	mericarp	2	1
Ruderals s.l.		**11**	**16**
Schoenoplectus tabernaemontani (C.C. Gmel.) Palla	achene	1	
Wet environments		**1**	**—**
Brassica/Sinapis	seed		7
Galium sp.	mericarp		2
Poaceae-wild group	caryopsis	1	3
Ranunculus sp.	achene		1
Alia		**1**	**13**
UNDETERMINED			1
TOTAL		**14**	**37**

1. Hard travertine limestones, layered, and occasionally including centimeter-sized holes.

2. Medium-sized pebbles.

3. Large, reddish, hard conglomerates made up of cm-sized pebbles.

4. Sandstones with rare pebbles included.

5. A dark-purple, slate-like stone.

6. Conglomerates, including three sub-types.

The travertine limestone derives probably from a single formation, the lower Pleistocene travertines,[2] specifically those from the outcrops near Poggio dell'Amore, ca. 1 aerial km to the E of the site (Fig. 6.11). The conglomerate and sandstone were found in a small outcrop of quartz-calcareous sandstone of the "pietraforte" type[3] near Montenero, ca. 7 km aerial distance to the E, where the stone appears with and without cm-sized pebbles.[4] Cumulatively, then, the stones used to build the structure at San Martino came from a radius of 2–7 km and include a remarkable heterogeneity of stone types, a factor that will be discussed below and in Ch. 16..

6.11 Discussion (KB)

Aside from the aforementioned possible buttressing attempt and the possible in-fills, the site seems to represent a single phase of use. The almost total absence of faunal material, minimal domestic rubbish, tiny number of small finds, and simple stratigraphy all point to sporadic or short-term use. The presence of a hearth remains problematic: the central area of the structure yielded some indications, including large microscopic charcoal particles, but no definitive evidence. The ceramic data provides clear evidence for cooking, possible storage activities as well as some minimal amphorae-born foodstuffs. It is important to remember that some of these finds (dolia sherds as well as the single loom weight) could also be present as construction material, but cumulatively, the data points to a variety of human activities (cooking and storage particularly) that took place on a light material footprint.

The most definitive evidence for the building's function comes from the botanical data. The combined presence of both pollen (Asteroideae, Cichoriae, and Fabaceae) and macroremains *(Hedysarum, Medicago, Melilotus*, and *Trifolium*) of fodder plants, plus the presence of fungi and parasite eggs associated with herbivore dung all strongly point to the use of the structure for animal stabling. The considerable quantities of algae in this context may also have been transported via urine. Given the size of the structure, those animals would likely have been sheep and/or goats. With the strong presence of pasture in the locale as well as the absence of other nearby structures, it seems likely the structure would be used sporadically—in moments of bad weather, during milking, etc. and in the context of on-the-hoof pasturing—rather than as a permanent stall.

The principal objection to this hypothesis is the near-absence of faunal material. Where are the animal bones if animals inhabited the building? One might expect a dearth of bones (even if animals resided within) if butchery, carcass processing, and cooking waste (alongside other material, e.g., ceramic) never (or rarely) was deposited in the structure. This dearth also eliminates certain species from consideration: despite the presence of a single pig tooth, pigs are unlikely to have been kept here, as the trash associated with food waste fed to pigs would have been incorporated into floor and occupation levels. Dogs can be eliminated for similar reasons. Equids are also unlikely, since no equid bones were recovered, not even shed deciduous teeth, which are sometimes associated with stables (as foals lose their baby teeth, which drop to the ground and can be stomped into the earth, if not cleared away). In addition, one might expect other structural modifications (e.g., mangers, feeding troughs, deeper drainage systems, etc.) to facilitate housing and maintenance of larger equids. The same might also be said of cattle, but there is certainly no strict standard in this regard. One can maintain plow oxen year-round in a shelter or barn without dramatically altering the structure with feeding contraptions constructed of stone, among other more permanent modifications.

Could the structure be used to house ovicaprids? This is certainly a possibility, but one which in turn has to be argued on the basis of negative evidence, as no definitive sheep/goat bones were identified from

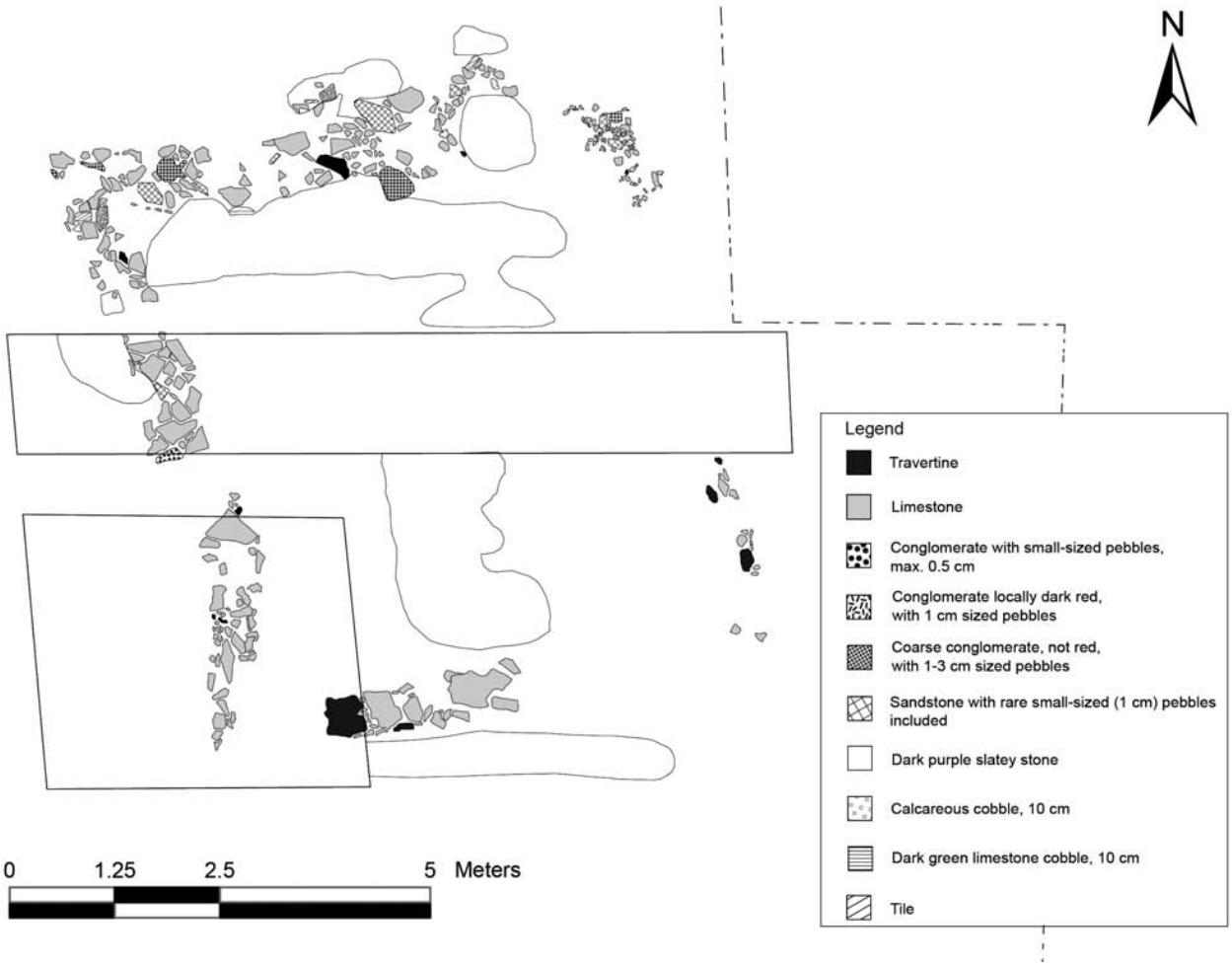


Fig. 6.10 San Martino, plan showing various types of building stones (AA/ERZ).

the site. Nonetheless, even if large numbers of animals were around during certain times of the year in transhumant operations, the climate and topography in the San Martino area in antiquity did not make it necessary to keep them in shelters. Where sufficient water and fodder are available, animals can be fed in enclosures or yards, rather than sheds or stone shelters. Moreover, there is certainly not enough space in the proposed structure excavated at San Martino to house any significant number of animals.

While large numbers of animals over the long term are unlikely to have been housed at San Martino, the structure likely could have been used as a multipurpose animal shelter (for ovicaprids and cattle), adapted as needed. Feeble and ill animals, moreover, may have been maintained for periods of time in the structure to recuperate. This was a fairly clean area (aside from stray fecal waste and associated parasites from such waste). Domestic food trash (including butchered bone waste) was not dumped in the structure, or if it was, such rubbish was removed while the structure was in operation. Deciduous teeth of ovicaprids (or cattle) do not surface in any significant numbers to suggest that the structure maintained newborn lambs, kids, or calves for any considerable amount of time. Whatever the case, an overall dearth of zooarchaeological remains need not discount any wider (or even principal) function of the site in housing, sheltering, or stabling animals.

The structure's architecture likewise suggests the modest investment consistent with a structure designed for sporadic use. The pisé walls were only once buttressed, while the use of wide range of

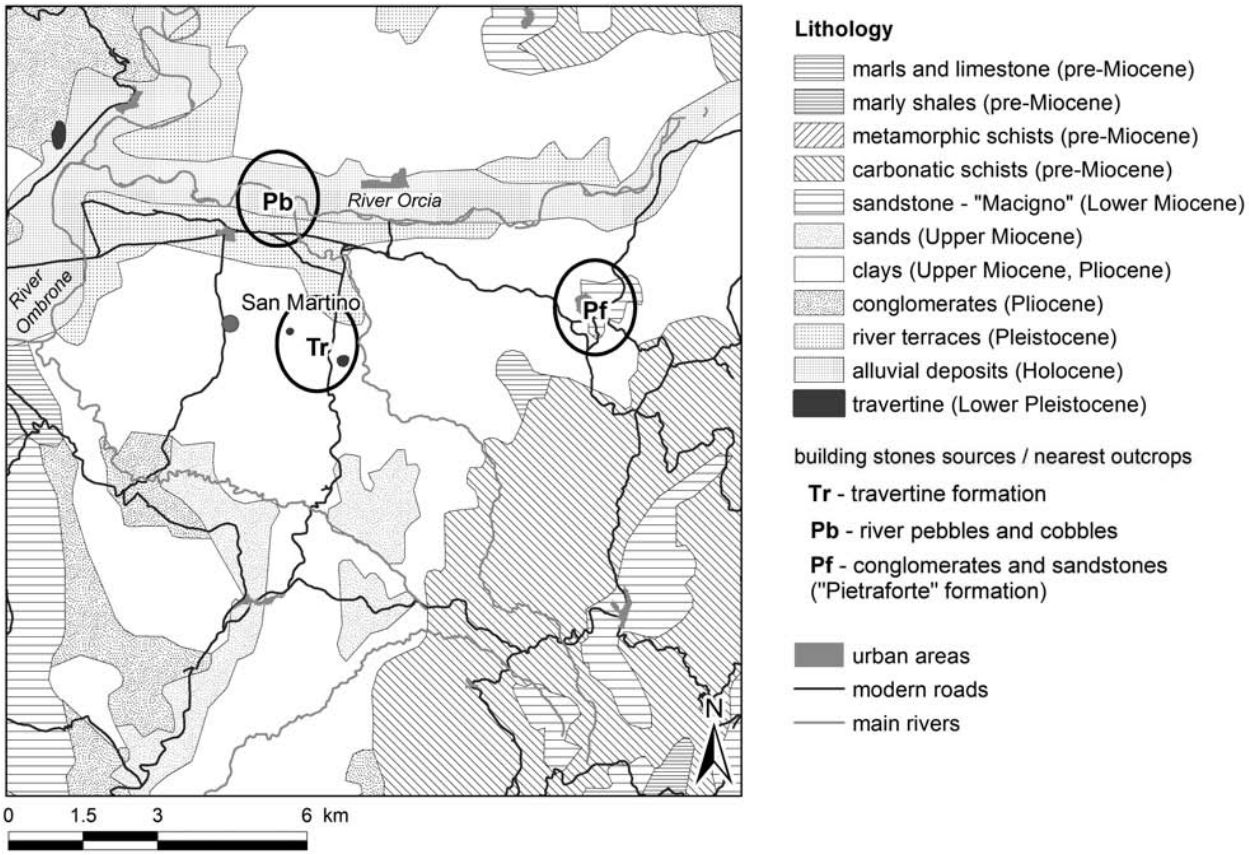


Fig. 6.11 San Martino, map showing nearest geological outcrops of building stones (AA).

building stones from diverse sources points to the gradual accumulation of recycled material from defunct structures throughout the landscape rather than a major planned project (see Ch. 16). The roofing material remains a mystery: the virtual absence of large tile fragments from the excavated materials lead us first to reconstruct the building with a straw roof (Fig. 6.12), the later quantification of tile fragments suggests a greater quantity than previously supposed. Their fragmented quality may point either to their use in the pisé of the upper walls or represent the broken remains of a roof whose major tiles had been reused. The former seems to have been the case at the nearby Poggio dell'Amore (see Ch. 7), whose tile count was similar, but cumulative weight was some 6 times that of the tiles preserved at San Martino. Thus, presence or absence of a tile roof must remain an open question.

NOTES:

6.1 The high presence of Cichorieae in samples P7 and P8 may be also partly due to the bad preservation of organic matter in these layers, causing some selective corrosion and low concentrations (Bottema 1975; Navarro et al. 2001).

6.2 Indicated as "T" on the 1:100.000 maps of the Servizio Geologico d'Italia, sheet 128.

6.3 Indicated as "pt^{1}" on the map of the Servizio Geologico d'Italia, sheet 129.

6.4 This appears to be the probable origin of the reddish conglomerate found at Pievina, where it was used as a millstone and found reused in a kiln. See above, Ch. 4.

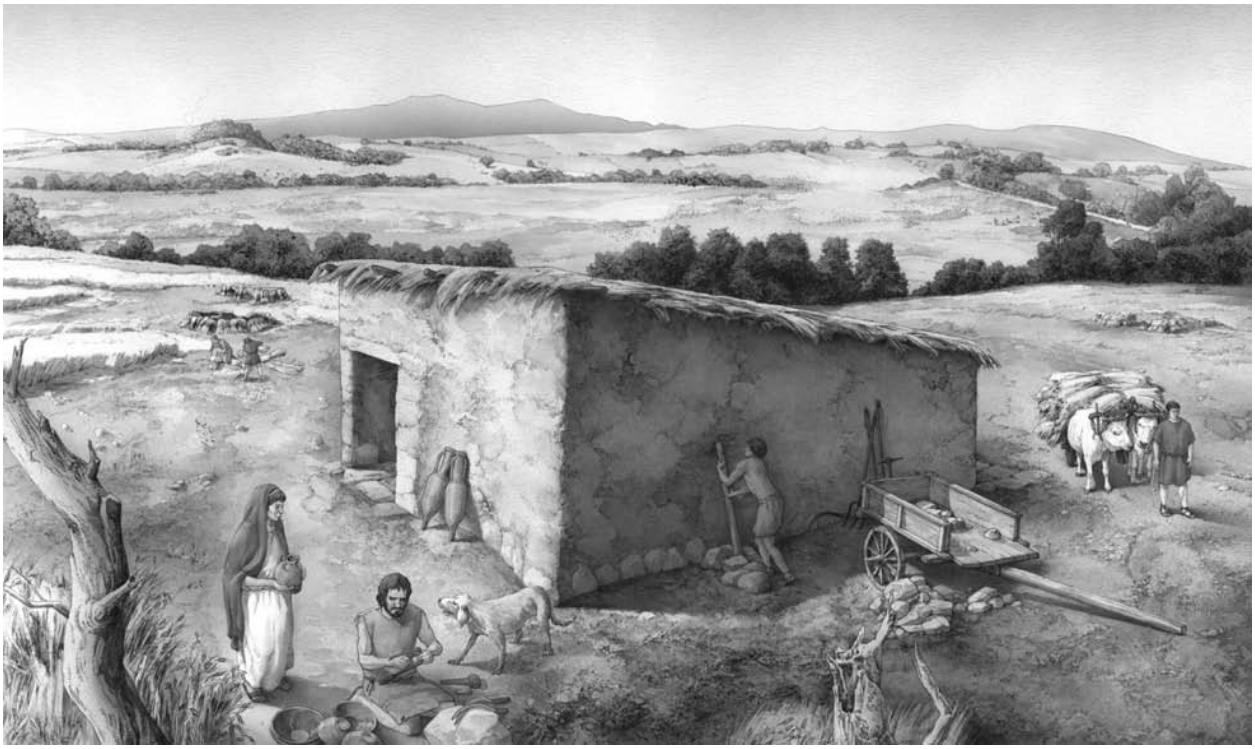


Fig. 6.12 Reconstruction of San Martino site (Studio InkLink). (See also color insert.)

7

Poggio dell'Amore

7.1 Situation (AA, MG)

The site of Poggio dell'Amore (Fig. 7.1) is located in the north-central part of the *comune*, SE of Borgo Santa Rita, in an area of gently rolling Pliocene-upper Miocene clays, occasionally covered, as is the case at the site, by small outcrops of travertine limestone. The site lies ca. 1 aerial km to the E of San Martino and at a somewhat higher elevation (ca. 155 m asl.; Fig.7.2). The surface scatter was located just below the hilltop on a slope inclining to the W. Towards the W the site had a greater than 180° view, while to the NW approximately 20 m away lay a large *fontone* or spring-fed pool.

7.2 Remote Sensing (MG)

The surface scatter (TU 435) at Poggio dell'Amore was very similar to San Martino, measuring some 30 x 20 m with a ceramic density of 1–3/m^2 and like that site, classified in Ghisleni's survey as a "habitation." The sites were also linked by the presence near Poggio dell'Amore of an outcrop of travertine limestone: travertine was used in the construction of San Martino (see Ch. 6). Thus, it was to better understand San Martino—its function, construction, and neighbors in the landscape—that we choose to excavate at Poggio dell'Amore.

Magnetometry survey on a 25 x 40 m grid revealed only one significant anomaly, just outside the E edge of the surface scatter (Fig. 7.3), and it was here that we began excavations.

7.3 Excavation (KB)

According to the proprietor, the field had been used for grain and thus plowed to only ca. 0.30 m in depth. However, the remains were found to have lain very close to the surface (0.20–0.40 m) and thus the site was badly damaged by plowing (Figs. 7.4 and 7.5).

Over the site of the magnetometry anomaly was found the fragmentary remains of a single, N/S wall (SU 6003), ca. 0.6 m wide and 4.6 m long composed of large to medium-sized unworked stones, set directly into the natural clay. A slight continuation of this wall to the S whose stones were smaller and less carefully aligned was assumed to represent collapse and/or plow damage to that wall.

An alignment of broken tiles (SU 6002) abutting and perpendicular to this wall seemed to mark the line of a second wall, but excavation beneath revealed only a trench, minus its stones, measuring some 0.70–0.80 m wide by 2.8 m long with a clear W terminus. We determined that SU 6002 marked the line of a robbed wall that joined SU 6003. The tiles themselves would seem to be the remains of a collapsed

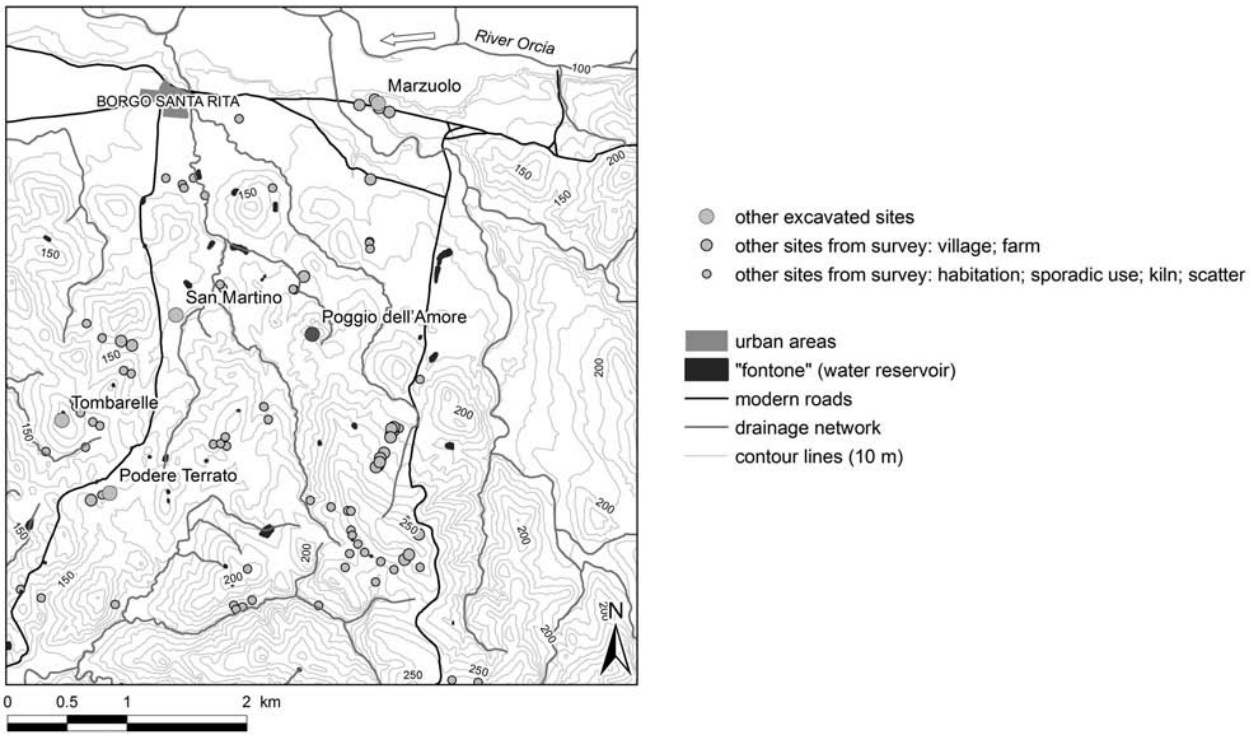


Fig. 7.1 Poggio dell'Amore, general topography and Roman sites (AA).

Fig. 7.2 Poggio dell'Amore, view of excavations looking W, showing location of San Martino and *fontone*.

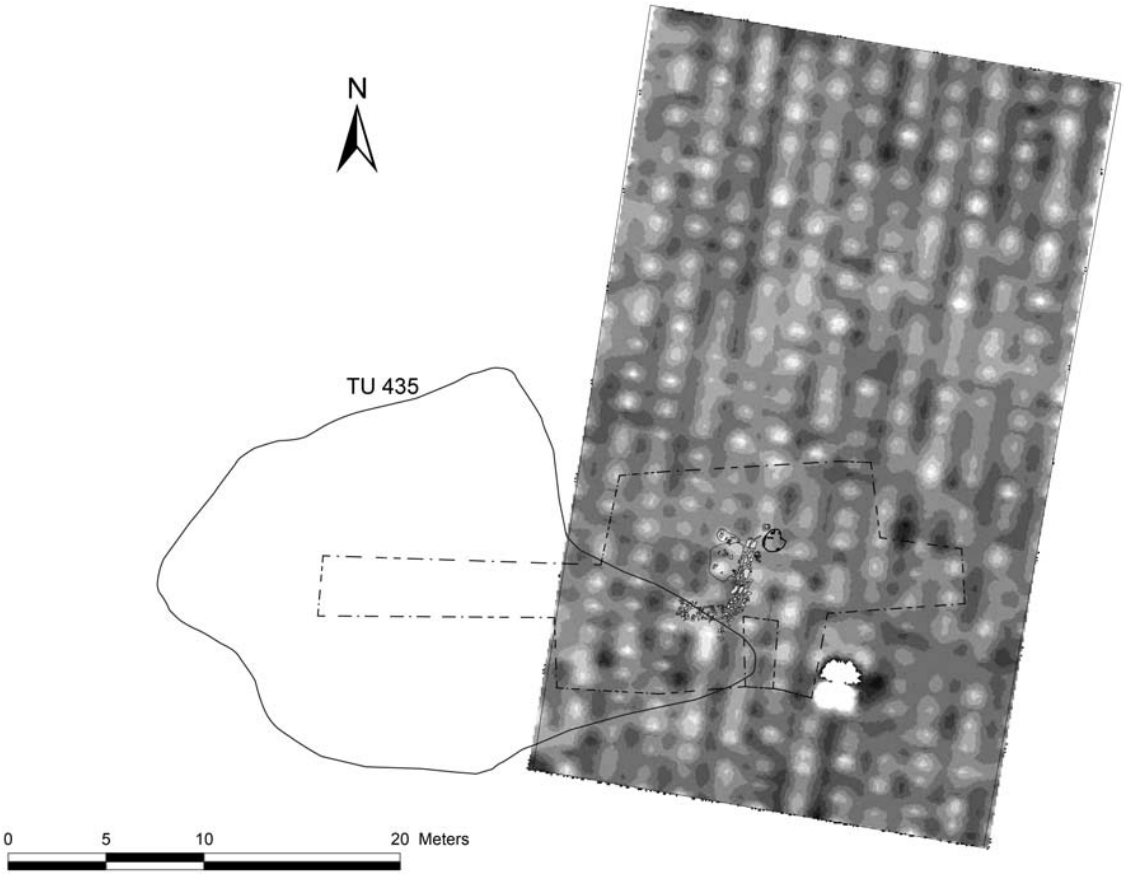


Fig. 7.3 Poggio dell'Amore, remote sensing results, overlaid with excavated remains (ERZ/MS).

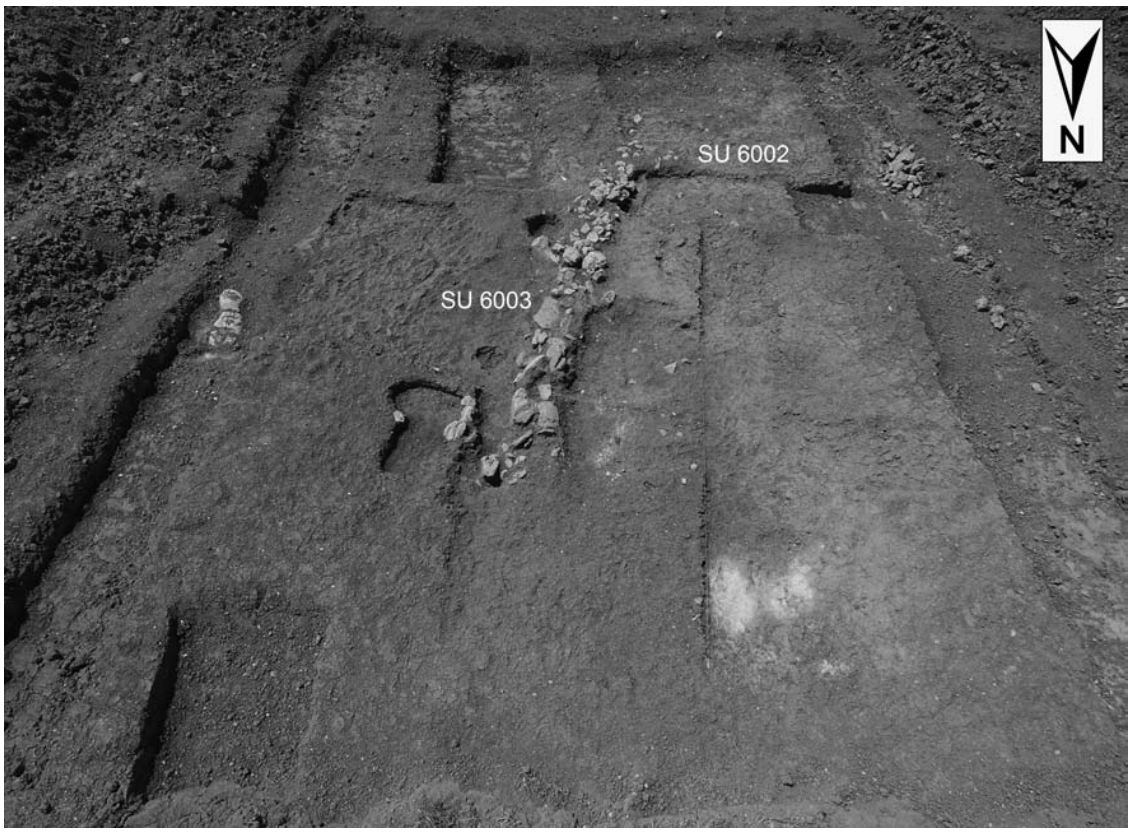


Fig. 7.4 Poggio dell'Amore, aerial view of site after excavation from N.

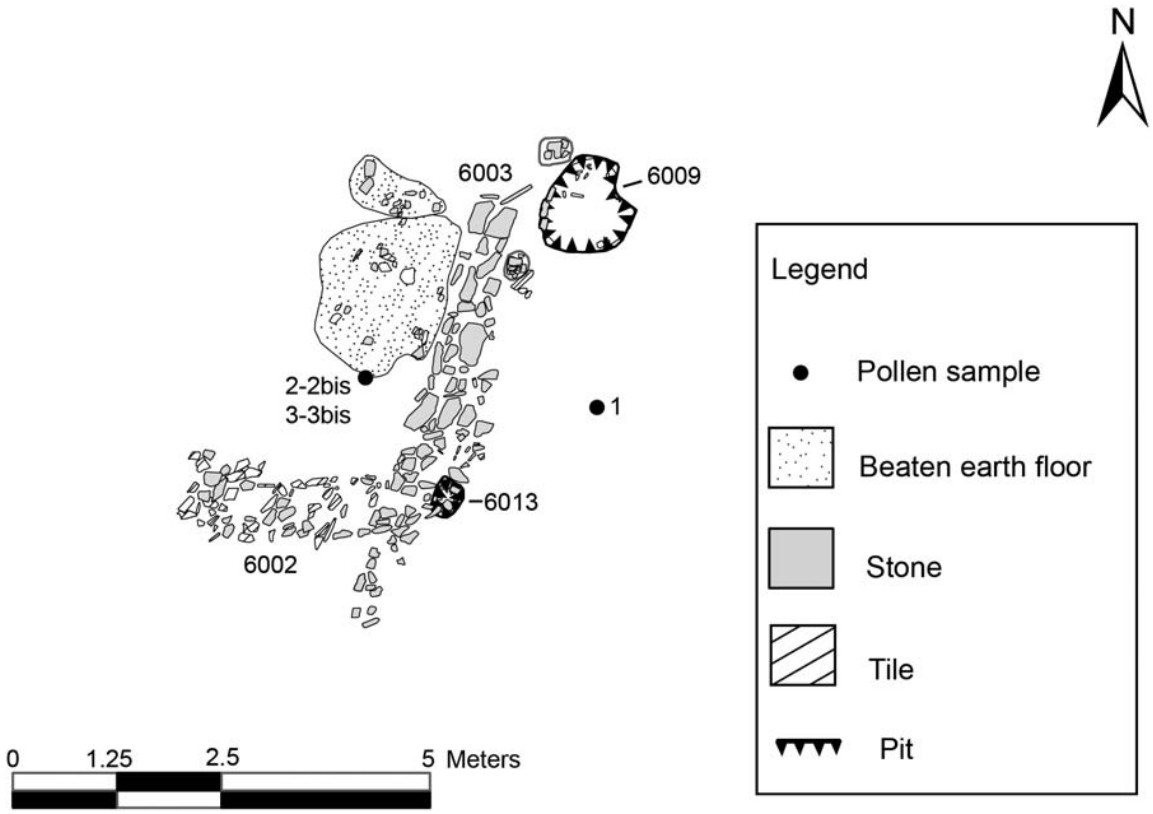


Fig. 7.5 Poggio dell'Amore, overall site plan (ERZ/MS).

tile roof through which the robbers had excavated to reach the wall, and then used to roughly backfill their robbing trench.

Sondages to the W and N failed to reveal any further walls, and indeed, the topsoil was found to lie directly on the natural clay in these areas, suggesting massive plow damage. The consistent carpet of the broken tiles in SU 6002 suggests the original presence of a tiled roof, which in turn strongly indicates a structure with four walls. Assuming that SU 6002 and 6003 represented the S and E walls of that structure, respectively, we should reconstruct a rectangular structure with exterior measurements of ca. 4.6 x 2.8 m. While there is insufficient evidence for the location of the door, none was found on the E and S walls, and among the missing walls, the W might be more probable as it probably lay slightly downslope and would have been protected from water runoff and provided the greatest visibility of the surrounding area.

The fragmentary remnants of a beaten-earth surface (SU 6004) were found inside the structure, near the wall. Composed of darker brown clay with large chunks of broken tile. Beneath this, a more compact layer (SU 6011) was identified as either a preparation level or an earlier floor.

Two features of uncertain function were found immediately the E of SU 6003. At the wall's S end was found a 50 cm wide and 20 cm deep circular cut (SU 6013) (Fig. 7.6), filled with dark, charcoal-free clay (SU 6012) and edged with small stones and tiles, as well as some glass fragments. The cut might be a posthole, but it seemed insufficiently deep for its diameter without sufficiently large bracing stones to support it. The absence of charcoal was also problematic. Alternatively, it might represent the cut-out seat for a dolium or other large vessel.

Towards the N end of SU 6003, another large, more irregular cut was found (SU 6009) (Fig. 7.7), likewise filled with dark, but charcoal-free clay (SU 6005). The fill, however, did contain a notable collection of broken cooking pots and its edge was partially lined by small stones. This feature was tentatively identified as a hearth, but again, the absence

Fig. 7.6 Poggio dell'Amore, SU 6013.

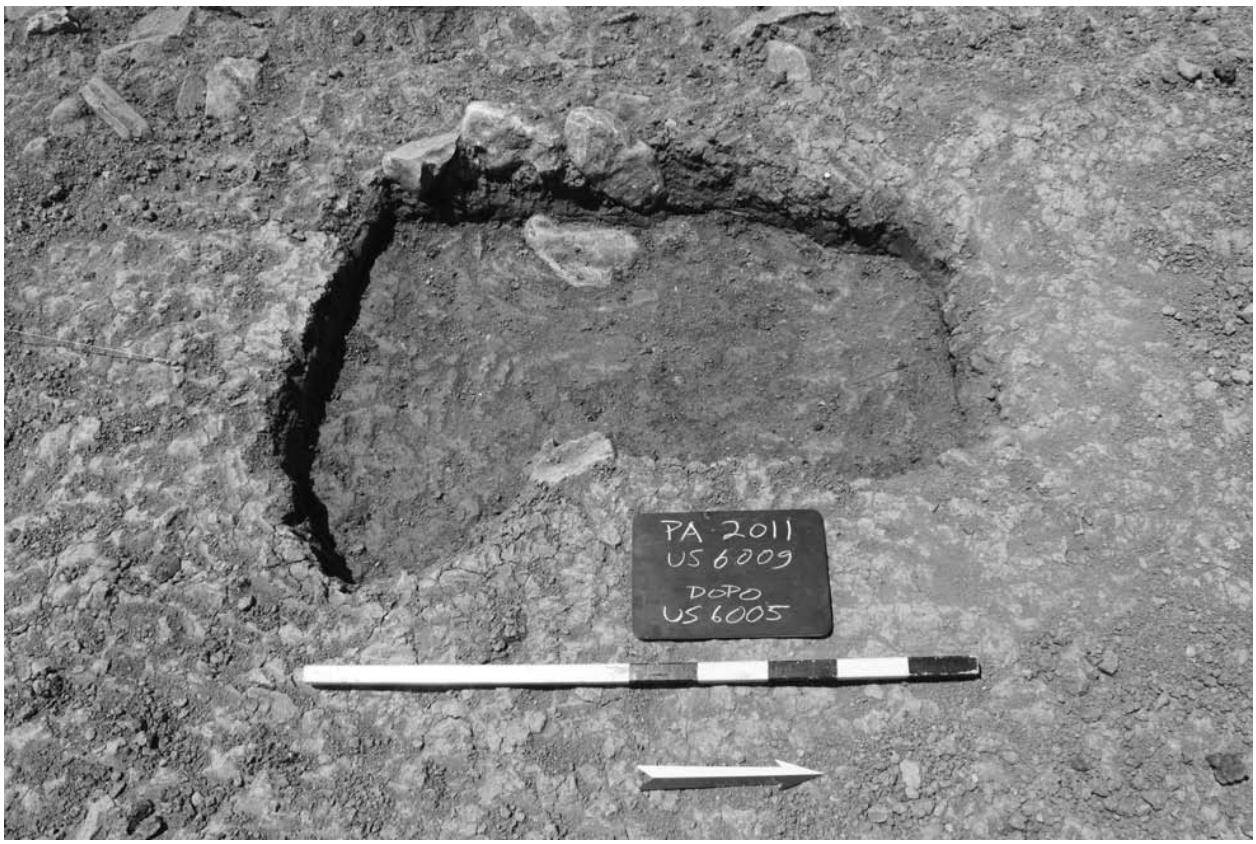


Fig. 7.7 Poggio dell'Amore, SU 6009.

of charcoal made this problematic. It is also possible that the irregular cut represents two successive, adjacent postholes, with their stone props partially preserved. The cooking pots become hard to explain unless they were used as infill.

7.4 Chronology (EV)

While badly damaged, the site (Table 7.1) produced a small, but consistent collection of ceramics (see Tables 7.2–7.3). The significant quantity of Italic sigillata and the absence of Black glazed ware would point to a generic date between the last decades of the 1st c. BC and the 1st c. AD. However, the possibility of identifying most of the Italic sigillata types also allows a more precise chronology. According to the presence of one bowl (Conspectus 14) (Fig. 7.8.6) the site may have started in the Augustan period although the majority of Italic sigillata types with later dates (Conspectus 3, 34, and 26) (Fig. 7.8.1, 2, 4–5, 7–9) from both SU 6001 and the filling of the robber trench (SU 6002) suggests a more likely date in the first half of the 1st c. AD. Two Conspectus 34, one Conspectus 3, and the only Conspectus 26 show fabrics which look similar to that typical of Marzuolo's production phase of Italic sigillata dated 50–70 AD (see Ch. 10). These three types are all part of the repertoire produced at Marzuolo in Area I (SU 10093). More thin section analysis would be necessary to ascertain the actual provenance of these vessels from Marzuolo and so far it can be only tentative, however, the presence of these wares would date the latest materials to ca. 70 AD. As with San Martino, below, we cannot know if the site was used for the whole of the range suggested by the ceramics (i.e., ca. 30 BC–70 AD) or only a portion of that period. At Poggio dell'Amore, the stratigraphic record was too damaged to be useful in this regard.

7.5 Ceramics (EV)

Excavations at Poggio dell'Amore recovered very few ceramics—a total of 133 sherds among which were a relatively high number of diagnostics (41) for a total of 21 MNI (Tables 7.2 and 7.3 and Fig. 7.8). Diversity among this assemblage was modest with some five different classes and 10 different forms.

The single largest class of ceramics were Italic sigillata (42.8%), an unusually high proportion even among our late Republican sites where fine wares are generally prevalent. Like nearby San Martino, in which a variety of fine wares were likewise an important component of the total ceramics, this points to a certain behavioral complexity around food consumption and in some cases, possible integration into regional fine ware distribution systems. However, as noted above, at least four Italic sigillata vessels have a fabric macroscopically similar to the materials produced at nearby Marzuolo (see Ch. 10) in the period 50–70 AD. Italic sigillata forms are, as is typical for our sites, dominated by cups (Conspectus 34, 26.2, and 34), bowls (Conspectus 14) (Fig. 7.8.6), and above all dishes (Conspectus 3 and 34) (Fig. 7.8.1, 4–5, 7–9).

Coarse (19.04%) and kitchen (28.57%) wares are less prevalent, although the quantity of kitchen wares is relatively high. These included one Tyrrhenian Dressel 2/4 spike (Fig. 7.8.10) and an unidentifiable table amphora (Fig. 7.8.17).

As is typical of late Republican sites in the project, tablewares, some 61.88% of the assemblage, dominated over kitchen wares (28.56%). As is also

Table 7.1 Poggio dell'Amore, major excavated contexts with diagnostic ceramics/dates (EV).

Context	Chronological Information: Pottery	Total MNI	Possible date	Reliability
6001	Italic sigillata: Consp. 34 (1 MNI); Consp. 26.2 (1 MNI)	7	first half of the 1st c. AD	Medium: association with top soil
6002	Italic sigillata: Consp. 14 (1 MNI); Consp. 3 (3 MNI); Consp. 34 (2 MNI); KW pot (2 MNI), lid (1 MNI) bowl (1 MNI)	10	late Tiberian-Flavian	Good
6004	Amphora: Dressel 2/4.	1	late 1st. c. BC–2nd c. AD	Poor: small MNI
6005	CW *tegame*; jar	2	1st. C. AD	Good

Table 7.2 Poggio dell'Amore, ceramic classes by MNI and % of MNI (EV).

Ware	Poggio dell'Amore (41 diagnostics/21 MNI)
BGW	0 or 0%
Italic sigillata	9 or 42.8%
Thin walls	0 or 0%
Experimental sigillata	0 or 0%
ARS	0 or 0%
Color-coated ware	0 or 0%
SCT	0 or 0%
Late Italic sigillata	0 or 0%
Coarse ware	4 or 19.04%
Kitchen ware	6 or 28.57%
Tunisian kitchen ware	0 or 0%
Amphorae	1 or 4.76%
Coarse ware/amphorae	1 or 4.76%
VRI	0 or 0%
Dolia	0 or 0%
Lamps	0 or 0%
Loomweights	0 or 0%
Amphora stopper	0 or 0%
Other ware (*tubuli*? and kiln spacers)	0 or 0%
Thin walls/coarse ware	0 or 0%
Color-coated ware/coarse ware	0 or 0%

Table 7.3 Poggio dell'Amore, ceramic forms/functions by MNI and % of MNI (EV).

FORMS	Poggio dell'Amore (41 diagnostics/21 MNI)
KITCHEN (includes KW and VRI)	**6 or 28.56%**
Generic closed forms for kitchen	0
Cooking pots	2 or 9.52%
Cooking jugs	0
Generic open forms for kitchen	0
Casseroles	2 or 9.52%
Cooking bowls	1 or 4.76%
Frying pans/*tegami*	0
Bread-baking pans/*testi*	0
Clibani	0
Cooking lids	1 or 4.76%

Table 7.3 cont'd Poggio dell'Amore, ceramic forms/functions by MNI and % of MNI (EV).

FORMS	Poggio dell'Amore (41 diagnostics/21 MNI)
DINING/STORING (includes CW, FW and CCW)	**13 or 61.88%**
Generic closed forms for table and storage	0
Jugs	3 or 14.28%
Jars	1 or 4.76%
Jugs/jars	0
Beakers	0
Small table pot	0
Bottles	0
Flasks	0
Chalice	0
Flanged-Bowls	0
Generic opens forms for table	1 or 4.76%
Bowls	0
Cups	5 or 23.8%
Dishes	3 or 14.28%
Bowls/Dishes	0
Basins	0
Lids	0
Small vessels for sauces or perfumes(?)	0
Uncertain (food processing?)	0
Mortaria	0
TRANSPORT and STORAGE	**2 or 9.52%**
Amphora stoppers	0
Amphorae	2 or 9.52%
Dolia	0
Table amph/jar	0
LIGHTING	**0**
Lamps	0
OTHER "FUNCTIONAL" CERAMICS	**0**
Loomweights	0
Drains	0
Unguentaria	0
Kiln spacers	0
Molds	0
Tubuli	0
RESIDUALS	**0**
UNCERTAIN	**0**

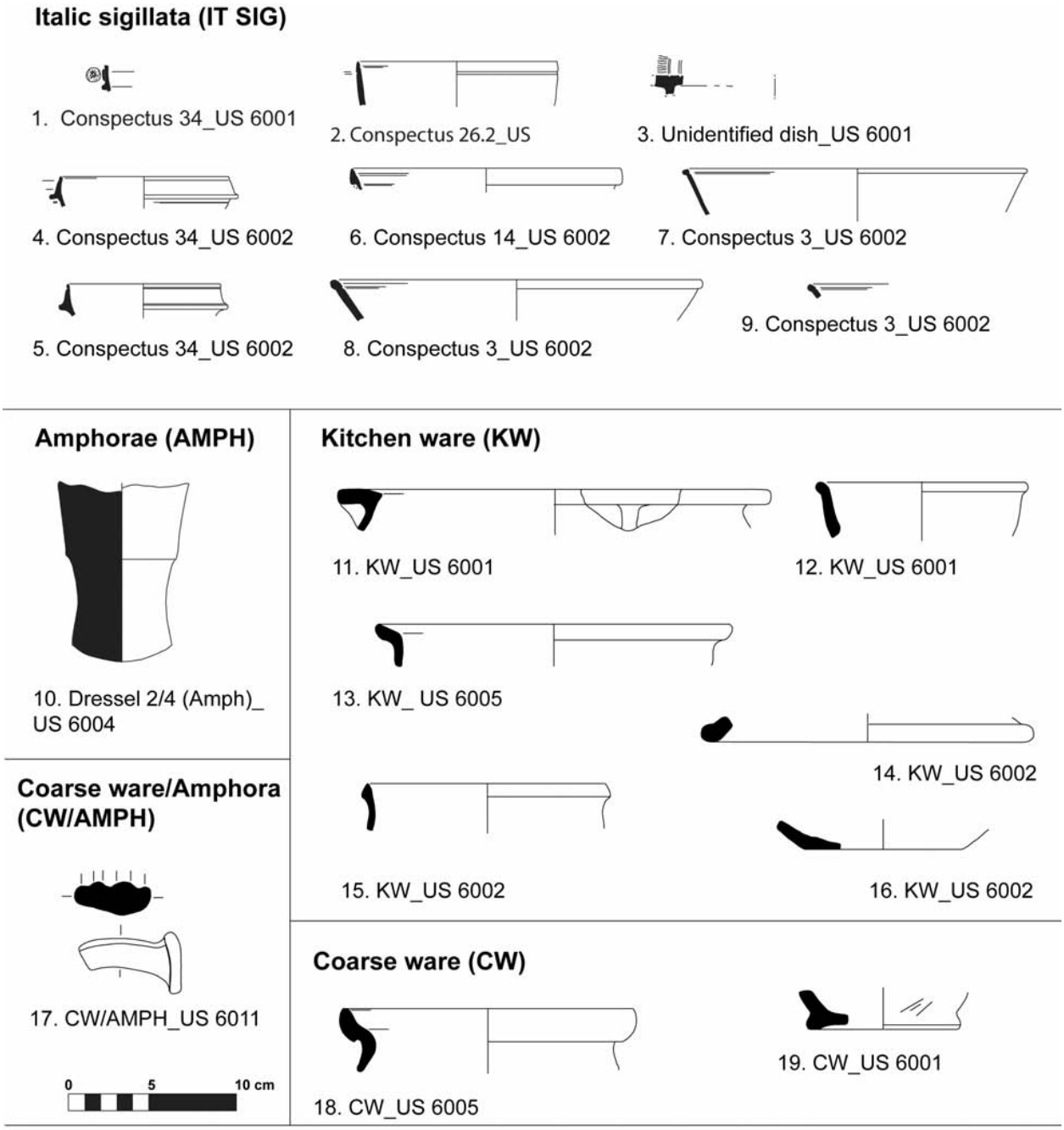


Fig. 7.8 Poggio dell'Amore, representative diagnostic ceramics from SU 6001, 6002, 6004, 6005, 6011. Italic sigillata (IT SIG): 1, 4–5. Cups Conspectus 34; 2. Cup Conspectus 26.2; 3. Unidentified dish; 6. Bowl Conspectus 14; 7–9. Conspectus 3 dishes. Amphora (AMPH): 10. Central/northern Tyrrhenian Dressel 2/4. Kitchen ware (KW): 11, 13. Casseroles; 12. Cooking bowl; 14. Lid; 15–16. Cooking pots. Coarse ware/Amphora (CW/AMPH): 17. Small amphora/large jug. Coarse ware (CW): 18–19. Jugs. (EV).

usual, tableware open vessels are most common, predominantly dishes (14.28%) and cups (23.8%), both in Italic sigillata. Closed vessels used predominantly for liquids are somewhat less common and are composed mostly of jugs (14.28%) and jars (4.76%) in coarse ware. Again, while the total MNI of each of these classes is tiny, the overall proportions echo trends from other sites.

Again, in tiny quantities, cooking wares show an even split between closed pots (9.52%) (Fig. 7.8.15–16) and a lid (Fig. 7.8.14), and open forms including casseroles (9.52%) (Fig. 7.8.11, 13) with and additional MNI of a cooking bowl (Fig. 7.8.12), all otherwise unclassifiable.

Finally, a quantification of the form and weight of tiles at the site supported the suggestion that the structure originally boasted a tile roof that had been later robbed (Table 7.4). While the overall fragment numbers are similar to San Martino (cf. Table 6.4), many larger fragments (particularly from SU 6002, the robbing context) and the cumulatively large weight of the tile assemblage strongly point to tiles used as roofing rather than as wall construction material.

7.6 Faunal Materials (MM)

The faunal assemblage from the site was extremely small (the entire collection weighed 13 g) and was restricted to two contexts (Table 7.5): three, isolated ovicaprid adult molar teeth (one possibly a sheep) were recovered from SU 6002, with a fourth ovicaprid tooth and two small limb bone fragments from a medium-sized mammal deriving from SU 6011. While all these materials were fragmentary and broken, none exhibited any visible traces of butchery, burning, cooking, or other signs of cultural processing. Additionally, none registered any distinct clues with which to assess other taphonomic forces or agents (such as trampling, carnivore gnawing, surface exposure, etc.). Overall, the material might be best characterized as the odd bit of rubbish or discarded bone that might otherwise escape any broader clearing or cleaning venture.

7.7 Geological Features, Land Units, and Land Evaluation (AA)

Poggio dell'Amore has a number of micro-local geological and hydrological features (Fig. 7.9). The site is adjacent to three travertine outcrops, one directly to the E and two larger ones more distant to the SE, the easternmost is near the locality Falsettaio. One or more of these are thought to have

Table 7.4 Poggio dell'Amore, tile fragments, forms, weights and quantities (EV).

Context	Tile Fragments	Tile Weight (g)	Imbrices Fragments	Imbrices Weight (g)	Unid. Fragments	Weight (g)	Total Fragments	Total Weight (g)
6004	24	4155	14	1335	28	590	66	6080
6011	27	5940	4	465	15	285	46	6690
6002	113	32760	50	8530	37	1330	200	42620
6001	13	4020	10	920	5	275	28	5243
6015	2	580			1	75	3	655
6005	3	1100	3	345	9	415	15	1860
6010	10	1535	5	465			15	2000
TOTAL	**192**	**50090**	**86**	**12060**	**95**	**2970**	**373**	**65148**

Table 7.5 Poggio dell'Amore, faunal remains (MM).

NISP total (cattle+sheep/goat+pig)	% cattle	% sheep/goat	% pig	NISP of other principal mammalian and avian taxa present
4	—	100 (4 sheep/goat teeth, (mandibular and maxillary molar fragments)	—	

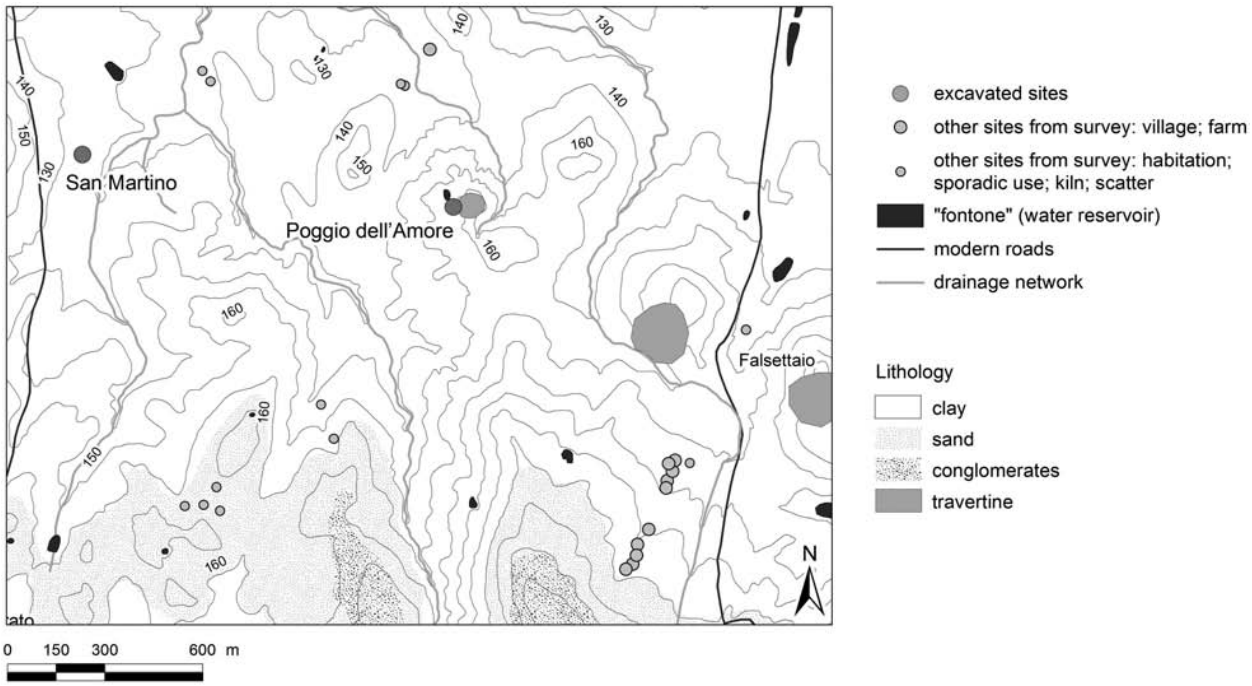


Fig. 7.9 Poggio dell'Amore, map of locale showing geological and hydrological features (AA).

provided some of the stone for both the wall at Poggio dell'Amore and those of San Martino, also since these are the only travertine outcrops in the area S of the Orcia River.

Furthermore, a large *fontone* or standing water pool is located some 30 m NW of the site (Fig. 7.10). While these travertine outcrops are definitely too small to feed an aquifer, it is possible that some primary water is flowing out from a deeper aquifer. It is likewise possible, but not certain, that the large *fontone* near the site was extant in antiquity. This question is taken up further below.

The land unit study carried out for this area (see Fig. 6.7) revealed a landscape well adapted for agriculture. Clayey soils are dominant in the area around Poggio dell'Amore, but lighter and better drained soils are exposed on the nearby river terraces. Evaluating the land suitability around the site (Fig. 7.11, hypothesis I), we presume that fine textured (clayey) soils are more suitable for cereal and fodder production than coarser textured soils, due to their higher natural fertility. This evaluation changes for the worse if we consider that these are more difficult to plow (Fig. 7.12, hypothesis II). The Poggio dell'Amore locale has also a dominant high suitability for pasture, because of the high water retention capacity of the clays and of the richness in natural water outflows, now mostly converted into *fontoni* (see Fig. 7.9).

7.8 Botanical Materials (AAM, ER, RR)

A total of five pollen samples and five macroremains samples were collected and treated (Tables 7.6–7.8). Pollen samples were taken from both inside the structure (4 samples from SU 6004, 6011), and outside (near-site sample, Sample P1) (See Fig. 7.5). Soil samples from SU 6002, 6004, 6005, 6011, and 6012 were subject to flotation and macroremain study.

A total of 2,329 pollen grains, 427 NPPs, 170 microcharcoals, and 446 seeds/fruits were counted (Table 7.6) Concentrations of on-site pollen were variable but on average quite high (12,499 p/g) and similar to the near-site sample (13,107 p/g). In all the samples, pollen was poorly preserved and showed signs of deformed grains and of thinned or reworked exines. This may be due to ancient excavation and reburial at the site, possibly associated with the wall/roof robbing. In many cases, pollen clusters, possibly

Fig. 7.10 Poggio dell'Amore, view of *fontone* from the W.

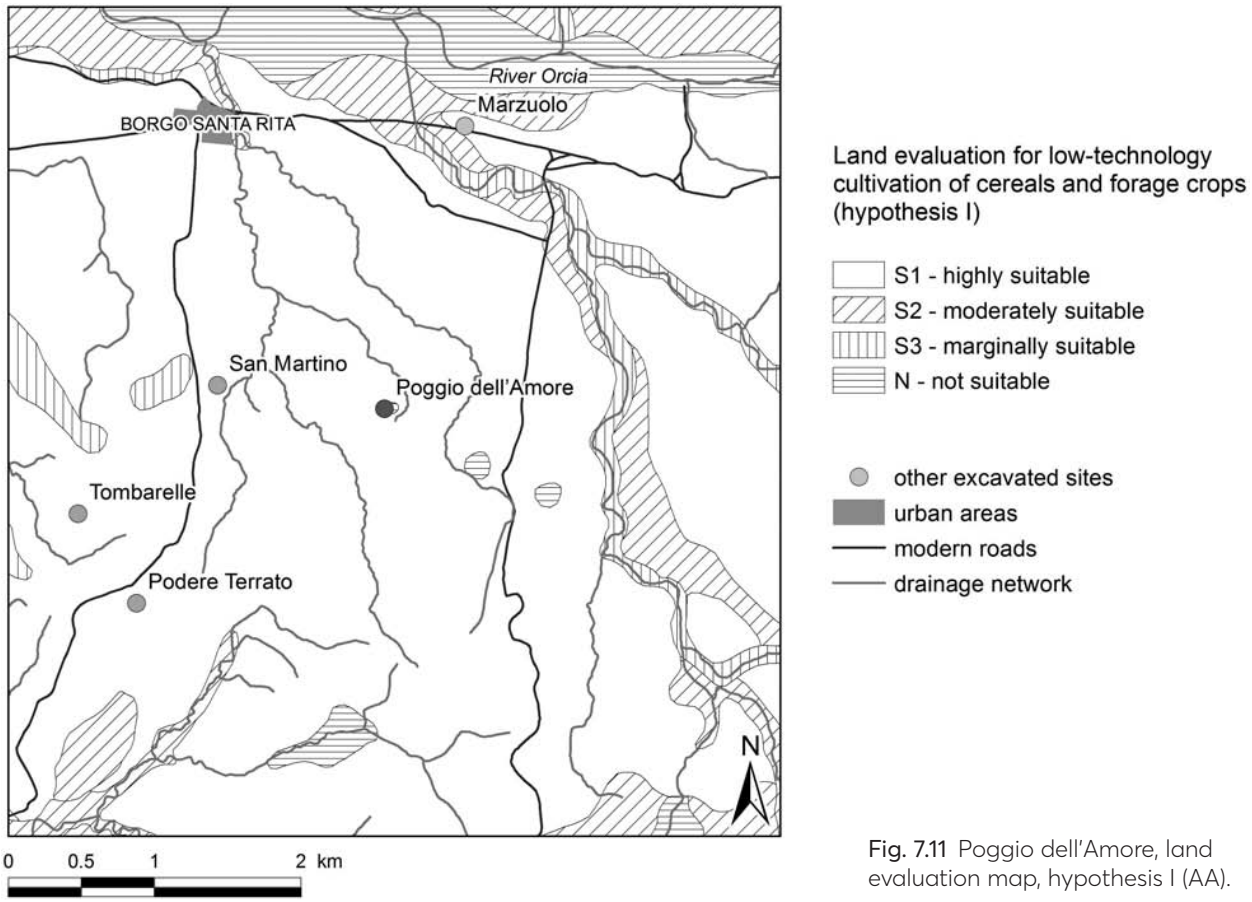


Fig. 7.11 Poggio dell'Amore, land evaluation map, hypothesis I (AA).

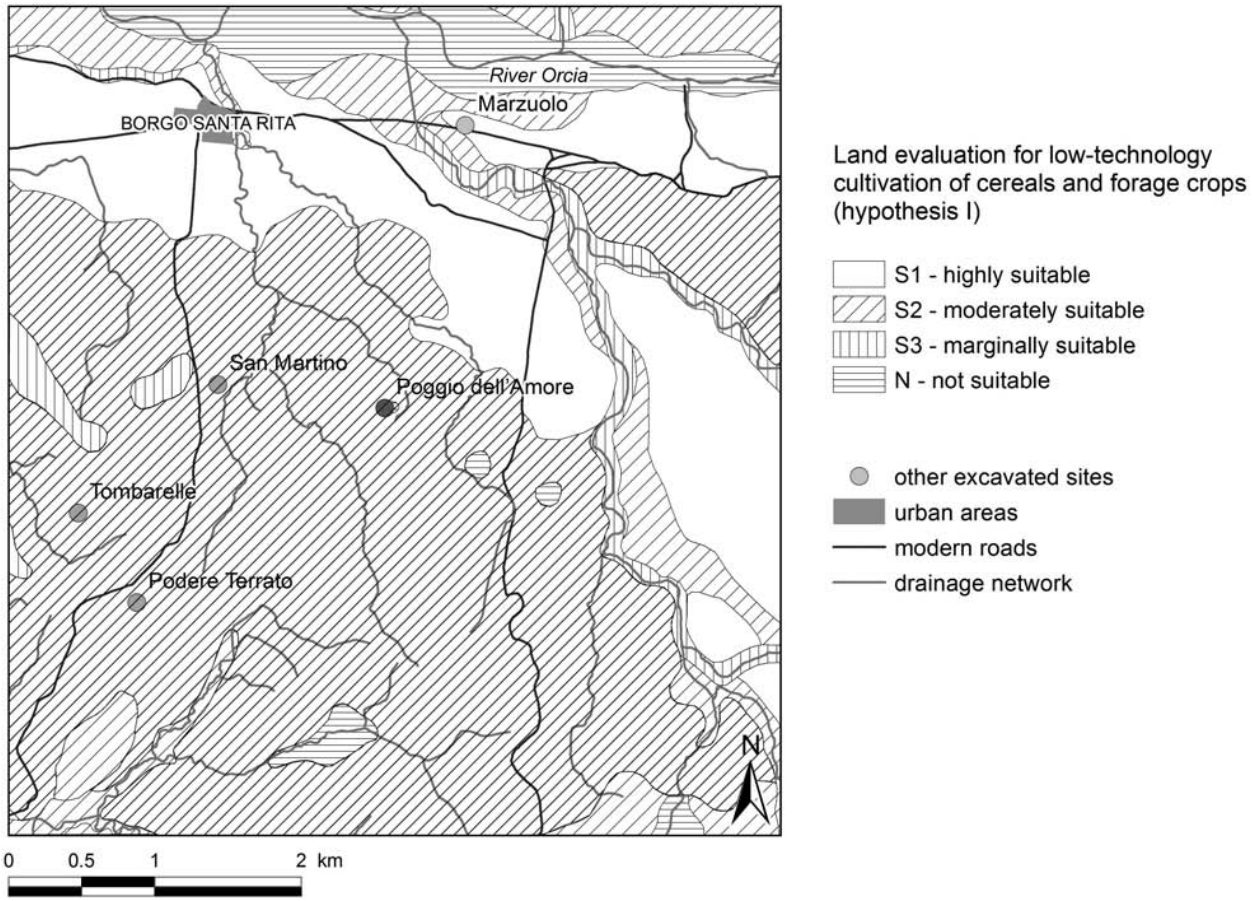


Fig. 7.12 Poggio dell'Amore, land evaluation map, hypothesis II (AA/ERZ).

coming from flowers transported to the site, were observed.

Forest cover and woodland composition: The site showed striking, but not unexpected similarities with the nearby San Martino. Pollen diversity was similar with the number of taxa in individual samples ranging from 38–48 (versus 37–51 at San Martino). Arboreal/Non-Arboreal pollen ratio (AP/NAP) was 13/87 inside the site and 14/86 near-site, both suggesting that woodlands were not proximate to the site. The low woodland percentages (13% on average) represent diverse types of woods: conifer woods, oakwoods, possibly mixed with conifer and broadleaf woods, Mediterranean woods, and hygrophilous woods. Again, *Pinus* (5.6%) and *Quercus* (4.4%) predominate: these are anemophilous high pollen producer plants, we should imagine even these low numbers indicate woods at a significant distance from the site, probably in the hilly vegetation belts on the conglomerates several km to the SW or on the more distant "macigno" or carbonatic-schists heights. The Mediterranean vegetation is only represented by traces (0.3% on average) of *Olea europaea* and *Erica arborea* cf., probably distributed occasionally in the sun-exposed slopes, while the hygrophilous woods, represented by few records of *Salix* and *Alnus*, were distributed near wet habitats. Plants producing fruits (0.6%) such as hazel and plum trees (*Corylus* and *Prunus*) may have grown wild in the oak woods.

Wet environments: Wet environments are represented (4.7%, of which 4.1% are aquatics and herbs) by the above-mentioned trees, helophytes growing at the edges of ponds and along the riverbanks of slow-flooding river (Cyperaceae, *Phragmites australis* cf., *Typha latifolia* type) and hydrophytes, water-floating plants (*Lemna*, *Myriophyllum*, *Nymphaea alba* type, *Sagittaria*). Although these percentages

Table 7.6 Poggio dell'Amore, pollen analysis (AMM/ER).

POGGIO DELL'AMORE Percentage pollen spectra									
Sample (PA)			***P1***	***P2***	***P2bis***	***P3***	***P3bis***	***Mean (inside structure)***	***Mean pollen spectrum***
Stratigraphic Unit			(near-site)	6011		6004			
Depth (cm)				25	11	15	6		
Pollen concentration (p/g)			**13107**	**27193**	**6315**	**6232**	**10258**	**12499**	**12621**
BETULACEAE	*Alnus*	Wt	0.7	1.0	0.4	0.4		0.4	0.5
	Betula				0.6			0.1	0.1
	Carpinus betulus	Ow		0.2				0.05	0.04
	Corylus	Ow	0.7		0.2	0.4	0.6	0.3	0.4
	Ostrya/Carpinus orientalis	Ow			0.6		0.6	0.3	0.2
CISTACEAE	*Helianthemum*		1.0	1.0	0.6			0.4	0.5
	Cistus			0.6				0.1	0.1
ERICACEAE	*Erica arborea* cf.	Md	0.3		0.4	0.2		0.1	0.2
FAGACEAE	*Fagus*		1.0			0.6		0.1	0.3
	Quercus deciduous	Ow	3.6	3.0	3.7	6.1	5.8	4.6	4.4
OLEACEAE	*Olea europaea*	Md	0.3						0.1
PINACEAE	*Abies*				0.4	0.4		0.2	0.2
	Pinus		5.3	5.1	6.3	8.9	2.6	5.7	5.6
RHAMNACEAE	*Rhamnus* type		0.3						0.1
ROSACEAE	*Prunus*			0.2		0.4		0.1	0.1
SALICACEAE	*Salix*	Wt	0.7						0.1
ALISMATACEAE	*Sagittaria*	Wh	1.7		1.4	0.8		0.5	0.8
AMARANTHACEAE	*Chenopodium*		1.7	2.6	2.4	1.2	2.2	2.1	2.0
APIACEAE	*Apiaceae*		0.7	1.4	0.4	2.4	3.2	1.8	1.6
ARACEAE	*Lemna*	Wh		1.0		0.8	0.2	0.5	0.4
ASTERACEAE	*Artemisia*		1.7	0.2	0.2	1.2	0.2	0.4	0.7
	Aster type	LPPl	5.6	4.1	2.2	1.0	3.8	2.8	3.3
	Carduus	LPPl	0.3	0.8		0.2	0.2	0.3	0.3
	Centaurea nigra type	LPPl	4.3	3.1	4.7	3.8	6.2	4.4	4.4
	Cichorieae	LPPl	25.8	32.5	38.4	36.8	36.4	36.0	34.0
BRASSICACEAE	*Brassica* type		1.0	0.6	1.6	0.6	0.2	0.7	0.8
	Brassicaceae indiff.			0.6	1.0	1.4	0.4	0.8	0.7
CARYOPHYLLACEAE	Caryophyllaceae		1.3	2.2	0.6	1.0	0.6	1.1	1.1
CONVULVULACEAE	*Convolvulus*		1.7	1.2	0.4	1.0	1.2	0.9	1.1
	Cuscuta europaea			0.2				0.05	0.04
CYPERACEAE	Cyperaceae	(Wh)	3.3	1.0	0.2	2.4	1.4	1.2	1.7
DIPSACACEAE	*Knautia*		1.0						0.2
EUPHORBIACEAE	Euphorbiaceae		0.3	0.2				0.05	0.1
FABACEAE	*Dorycnium*	le	1.3	1.2	0.8	0.4	0.6	0.7	0.9
	Fabaceae indiff.	le			0.2	0.6	3.2	1.0	0.8
	Lotus	le		1.2	0.2			0.3	0.3
	Medicago	le					0.6	0.1	0.1
	Trifolium	le	0.3	2.6	0.2	1.2	0.6	1.1	1.0
HALORAGACEAE	*Myriophyllum*				0.6			0.1	0.1
LAMIACEAE	Lamiaceae indiff.		4.3	2.0	2.4	1.6	3.6	2.4	2.8

Table 7.6 cont'd Poggio dell'Amore, pollen analysis (AMM/ER).

POGGIO DELL'AMORE Percentage pollen spectra									
Sample (PA)			***P1***	***P2***	***P2bis***	***P3***	***P3bis***	***Mean (inside structure)***	***Mean pollen spectrum***
Stratigraphic Unit			(near-site)	6011		6004			
Depth (cm)				25	11	15	6		
Pollen concentration (p/g)			**13107**	**27193**	**6315**	**6232**	**10258**	**12499**	**12621**
	Mentha type		1.0	0.2				0.05	0.2
MALVACEAE	Malva		0.3			0.2		0.05	0.1
NYMPHAEACEAE	*Nymphaea alba* type	Wh	0.7	0.6	0.2	0.4		0.3	0.4
PLANTAGINACEAE	*Plantago*		0.3	2.0	1.8	0.8	1.2	1.4	1.2
POACEAE	*Avena/Triticum* group	ce		0.6		0.2		0.2	0.2
	Hordeum group	ce	0.3	2.4	0.2	0.2	0.6	0.8	0.7
	Cerealia indiff.	ce	2.0	2.8	2.9	2.6	0.2	2.1	2.1
	Phragmites	Wh	1.0	1.4	1.2		0.2	0.7	0.7
	Poaceae-wild group		11.3	10.8	8.0	9.3	8.9	9.3	9.7
POLYGONACEAE	*Polygonum persicaria* cf.			0.6	0.2		0.2	0.2	0.2
PRIMULACEAE	*Anagallis*		0.3						0.1
RANUNCULACEAE	*Ranunculus* type	LPPl	4.0	3.1	3.9	5.3	2.0	3.6	3.7
	Ranunculaceae indiff.	LPPl			1.4		1.0	0.6	0.5
ROSACEAE	*Potentilla*	LPPl			0.2			0.05	0.04
	Rosaceae indiff.		0.3	1.2	0.4	0.4	0.6	0.6	0.6
SAXIFRAGACEAE	*Saxifraga* cf.		2.0	0.2	1.0		1.0	0.5	0.8
SCROPHULARIACEAE	*Euphrasia*		0.3						0.1
	Scrophulariaceae indiff.		0.3	0.2	0.4			0.1	0.2
SOLANACEAE	*Hyoscyamus*					0.2		0.05	0.04
	Solanum nigrum type				0.6	0.4	0.6	0.4	0.3
TYPHACEAE	*Typha latifolia* type	Wh		0.2				0.05	0.04
URTICACEAE	*Urtica dioica* type		0.3	0.2			0.6	0.2	0.2
	Urtica cf. *pilulifera*		0.3	1.8	0.2	1.4	1.0	1.1	0.9
Unknown/Indet.			5.0	2.4	6.7	3.2	7.7	5.0	5.0
POLLEN SUM		**302**	**508**	**510**	**506**	**503**	**507**	**466**	
NUMBER OF TAXA		**48**	**44**	**45**	**41**	**38**			
SUMS									
Arboreal pollen		AP	**13.9**	**11.0**	**13.1**	**17.4**	**9.5**	**12.8**	**13.0**
Non Arboreal pollen		NAP	**86.1**	**89.0**	**86.9**	**82.6**	**90.4**	**87.2**	**87.0**
Mixed oak wood		Ow	**4.3**	**3.1**	**4.5**	**6.5**	**7.0**	**5.3**	**5.1**
Mediterranean trees/shrubs		Md	**0.7**		**0.4**	**0.2**		**0.1**	**0.3**
Wet environments (trees)		Wt	1.3	1.0	0.4	0.4		0.4	0.6
Wet environments (herbs)		Wh	3.3	3.1	3.3	2.0	0.4	2.2	2.4
Wet environments (Cyperaceae)		(Wh)	3.3	1.0	0.2	2.4	1.4	1.2	1.7
Wet environments		WE	**7.9**	**5.1**	**3.9**	**4.7**	**1.8**	**3.9**	**4.7**
Cerealia		ce	**2.3**	**5.7**	**3.1**	**3.0**	**0.8**	**3.2**	**3.0**
Legumes/pulses (-fodder)		le	**1.7**	**4.9**	**1.4**	**2.2**	**5.0**	**3.4**	**3.0**
LPPl (-Cich)			14.2	11.2	12.4	10.3	13.1	11.7	12.2
LPPl		LPPl	**40.1**	**43.7**	**50.8**	**47.0**	**49.5**	**47.8**	**46.2**

are low, they do provide clear indications of freshwater habitats nearby. They are more represented than at the nearby San Martino (4.2%, with aquatics and wet environments herb plants only 2.0%).

Cereal fields: Unlike San Martino, pollen of cereals is sufficiently high (3% on average) to support the hypothesis that cereal fields were grown in the vicinity of the site. Different cereals were cultivated, represented in the spectra by *Avena-Triticum* group and *Hordeum* group, while Cerealia indiff. include the folded-crumpled grains that cannot be distinguished and ascribed to the previous groups. The percentages of cereal pollen are not compatible with the use of the structure for storage (see also macroremain data below).

Pastures and fodder: Again as at San Martino, many pollen taxa refer to the presence of pastures or to practices of animal foraging. The LPPI is 46.2% on average (12.2% without Cichorieae). Besides Cichorieae that cover 3/4 of the sum, there is a good presence of dry pasture indicators such as *Centaurea nigra* type (4.4%), *Aster* type (3.3%), and Ranunculaceae (4.1%). Significant amounts of Fabaceae (including, e.g., *Medicago* and *Trifolium*; 3.3%) and also partly Poaceae-wild group point to the presence of legume-fodder. Other herbs are common in pastures or in abandoned fields (Apiaceae, *Brassica* type and Brassicaceae indiff., Caryophyllaceae, and *Chenopodium*) and represent lands that may have been used as grazing areas.

Non-Pollen Palynomorphs

Spores and hyphas of fungi, spores and other elements of algae and zoomicroremains were present but low in all samples (Table 7.7).

Fungi (17 morphotypes plus some undifferentiated spores) amounted to ca. 1,685 NPP/g on average and included a variety of types, particularly those that indicate pasture animals. They include Ascospores that may be diffused in an environment with slow water and live on dung and on organic material. For example, Sordariaceae and *Sporormiella* are coprophilous fungi that live on dung and are markers of animals. In addition to fungi indicative of animals, *Tilletia*, a fungus pathogen of plants (including *T. tritici* and *T. secalis*) and particularly of cereals, supports the palynological data for nearby cereal fields. *Coniochaeta linaria* is a decomposer mushroom and is located particularly on wood, while *Chaetonium*,

Table 7.7 Poggio dell'Amore, non-pollen palynomorph and microcharcoal analysis (AMM/ER).

POGGIO DELL'AMORE Non-Pollen Palynomorphs and Microcharcoals						
Sample (PA)		***P1***	***P2***	***P3***	***P4***	***P5***
Stratigraphic Unit		(near-site)	6011		6004	
Depth - cm			25	11	15	6
NON-POLLEN PALYNOMORPHS (concentration NPP/g)						
FUNGI	Acritarch, *Amium*, Ascospora (HdV18), *Chaetomium* (HdV7), *Coniochaeta lignaria* (HdV172), *Gelasinospora, Glomus* (incl. *G. fascicolatum*), HdV201, *Podospora* type (HdV368), *Scleroderma, Sordaria* type, *Sordariaceae* indiff., *Spaerodes, Valsaria uariospora* type, *Tilletia, Trichocladium* type	827	3102	1271	2355	873
ALGAE	*HdV181, HdV182, HdV984, Pseudoschizaea, Spirogyra*	92	1119	542	829	412
ZOOMICROREMAINS	*Capillaria, Fragments of invertebrates indiff.*	230	305	150	265	75
	Total Concentration of classified NPPs (NPP/g)	**1149**	**4526**	**1963**	**3449**	**1360**
MICROCHARCOALS						
	125–200 µm (ch/g)	184	915	860	763	100
	201–500 µm (ch/g)	0	458	598	166	12
	Total Concentration of microcharcoals (ch/g)	**184**	**1373**	**1458**	**929**	**112**

though present in low quantities, is an indicator of fires: the presence of these fungi is in agreement with that of the microcharcoal particles observed in the same slides (see below).

Algae (6 morphotypes) concentration is low (599 NPP/g on average) but common. All sample contain the Pseudoschizaea (or Concentricystes), the most common family which are an anthropogenic indicator of soil erosion and live in freshwater or moist environments (Grenfell 1995). All samples also contain HdV181, which lives at the surface of water.

Zoomicroremains were few (205 NPP/g on average) but include parts of arthropods (mandibles, appendages, and hair) and other invertebrate organisms. In the sample P11/2bis, a single egg of the parasite *Capillaria* was found. *Capillaria* includes roundworms and parasites of domestic animals, rodents, and, under poor hygiene conditions (capillariasis), humans. Also, interesting is the presence of "plumes," probably of insects of the bee family (Apidi).

Microcharcoal Particles

Microscopic particles of charcoals >125 μm that are indicative of fires are present in all samples but with low concentration (1,710 ch/g on average) (Table 7.7). Very large charcoals >400 μm are also observed in all samples, especially in P11/3 (SU 6004). These provide further evidence for fires at the site.

Macroremains

Five samples from five different contexts were examined (Table 7.8). The total number of remains is very low (446 records in 851) and poorly preserved. Therefore, there is no evidence of plant accumulation or processing in place. One record of *Vitis vinifera* (traces in two samples; broken pip, small piece) is insufficient to support plant transport/processing. Cereals are absent, suggesting that, although cereal fields may have been nearby, cereals were not accumulated at the site.

As at San Martino, the archaeobotanical record is dominated by seeds and fruits of herbaceous plants. Wild plants represent ruderal environments and pasturelands. Again, genera and species of Fabaceae that may have been cultivated as fodder (*Melilotus* and *Trifolium*) are present. *Helminthotheca echioides* (Asteraceae) and *Brassica* may represent weeds of pastures among the herbs that are not browsed and may easily bloom and produce fruits.

7.9 Coins/Small Finds (SCE)

Like San Martino, Poggio dell'Amore had a noticeable dearth of metal finds: only one, a fragment of an iron nail that came from one cuts outside the structure (SU 6009/6005) and was tentatively identified as a hearth. No coins were found on the site.

7.10 Glass (SCE, ERR)

Interestingly, stratified contexts yielded 23 fragments (16.5 g, EVE 0) of vessel glass (Fig. 7.13). No rim or base fragments were recovered (hence the zero EVE), but rather all were small body shards save for a handle (SF 406007). Taking the total assemblage of glass finds resulted in an MNI of perhaps four: one pitcher, one balsamarium or small bottle, and two different unidentifiable vessel forms (one in colorless the other in sky-blue glass). These fragments came from a limited range of contexts (SU 6001, 6002, 6011, and 6012). One thin body fragment of colorless glass (SF 406004), could be attributed to a balsmarium or a small bottle, although which one cannot be decided on the basis of the small fragment alone. The handle (SF 406007), an upright, vertical ribbon form blue-green in color, is broken midway up the length of the handle. It would have fit any number of the rounded jars, jugs, or pitchers produced in the period from the 1st to 4th c. AD. One body shard (SF 406001) probably belongs to a small, mold-blown bowl, given slight vertical ribbing on the external surface of the fragment. The topsoil context SU 6001 also yielded four modern fragments of glass (SF 406002, 406003).

7.11 Building Materials (AA)

The analysis of building stones is based on the single preserved wall (SU 6003) (Fig. 7.14). The principal stones used for this wall were:

1. Hard travertine limestones, layered, and occasionally including centimeter-sized holes.

Table 7.8 Poggio dell'Amore, macroremains analysis (AMM/RR).

POGGIO DELL'AMORE Macroremains						
Sample (PA)		***M1***	***M2***	***M3***	***M4***	***M5***
Stratigraphic Unit		**6002**	**6004**	**6011**	**6005**	**6012**
Sediment volume (liters)		20	20	20	20	5
Vitis vinifera	pip	2			1	
Fruit trees		**2**			**1**	
Anagallis arvensis L.	seed	1	1		2	
Helminthotheca echioides (L.) Holub	achene	129		3	6	35
Geranium disectum L.	seed	4				
Malva sp.	seed	4		1		
Melilotus sp.	legume				2	
Petrorhagia prolifera (L.) P.W. Ball & Heywood	seed			1		
Polygonum aviculare group	achene	2				
Thymelaea passerina (L.) Coss.Germ.	seed	1				
Trifolium dubium/campestre	legume				1	
Trifolium repens L.	legume				1	
Trifolium cf. *striatum*	legume	1				
Trifolium cf. *subterraneum*	legume		1			
Trifolium sp.	legume	3		1		
Verbena officinalis L.	mericarp	1				
Ruderals s.l.		**146**	**2**	**6**	**12**	**35**
Carex sp.	achene					
Leersia oryzoides (L.) Sw	caryopsis	15		1		
Wet Environments		**15**		**1**		
Brassica sp.	seed	81	3	9	20	6
Poaceae-wild group	caryopsis	35	17	20	5	30
Alia		**116**	**20**	**29**	**25**	**36**
UNDETERMINED						
TOTAL		**279**	**22**	**36**	**38**	**71**

CHARRED

2. Crystalline sandstones.

3. Hard conglomerates.

4. The occasional presence of rounded pebbles and boulders.

A total of four different stones were used in the building. Apart from the rare river pebbles, these derive essentially from two different formations.

1. The travertine limestone most likely derives from the outcrop immediately behind the site.

2. The conglomerate and sandstone were found in a small outcrop of quartz-calcareous sandstone

Fig. 7.13 Poggio dell'Amore, glass SF 406007 and SF 406001 (SCE).

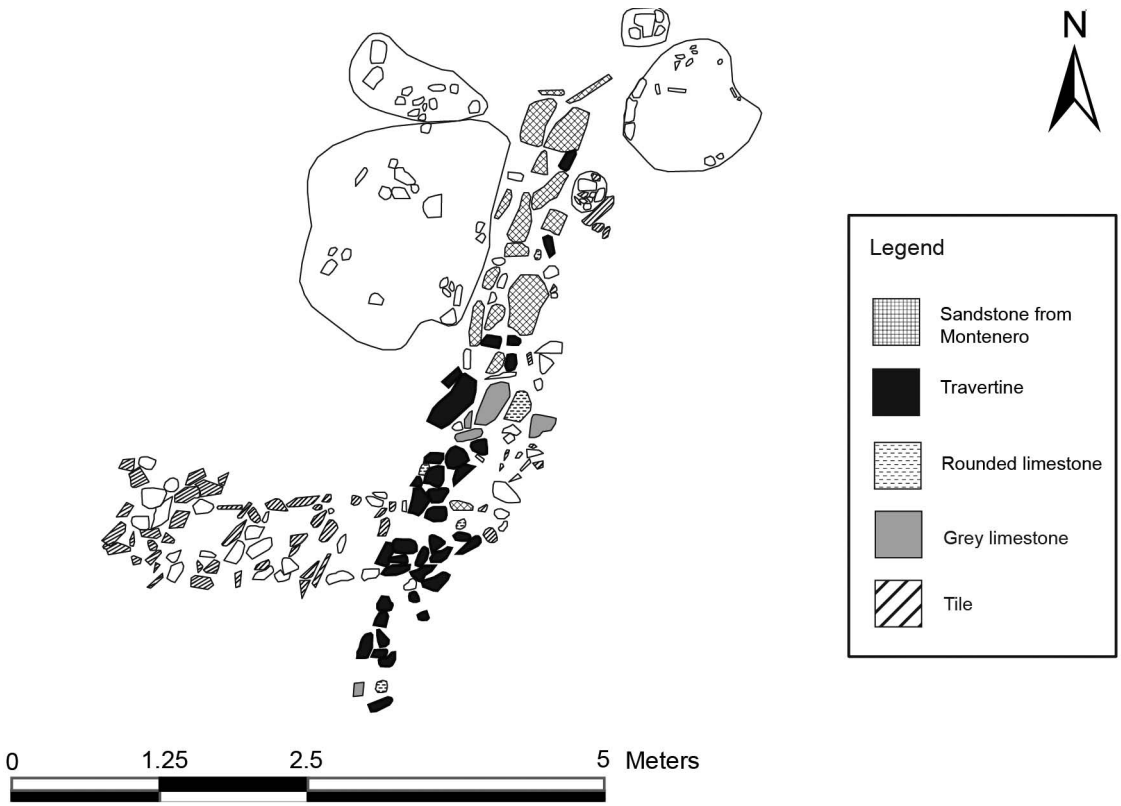


Fig. 7.14 Poggio dell'Amore, plan showing various types of building stones (ERZ/MS).

of the "pietraforte" type near Montenero, ca. 6 km aerial distance to the E, where the stone appears with and without cm-sized rounded inclusions.

3. Rounded limestone river pebbles from the Orcia/Ombrone Rivers.

The stones used to build the structure at Poggio dell'Amore, at least that wall that remains, came from a maximum distance of 6 km (Fig. 7.15).

It is interesting that instead of being constructed almost wholly of the locally available travertine, the remaining wall of Poggio dell'Amore was constructed of more or less the same diversity of materials that are found at San Martino. As will be discussed later (Ch. 16), this speaks to the tendency to use recycled materials for these temporary use structures rather than quarry new materials.

7.12 Discussion (KB)

Despite its very bad level of preservation, some hypotheses can be made regarding the function of the site, particularly in comparison with San Martino, with which it shares a locale, its small size, and many other aspects of its material character. The poor preservation does, however, introduce a level of uncertainty into all these considerations.

Like San Martino, Poggio dell'Amore yielded tiny quantities of ceramics, faunal, and small finds. The ceramic finds were particularly lacunose (133 sherds/21MNI versus 343 sherds/47MNI at San Martino). Similarly, no definitive installations for cooking or storage were found although again, the two cuts outside the structure may very well be their fragmentary remains. The significant presence of microcharcoals of variable sizes does indicate fires, perhaps for cooking, as do the cooking pots. And

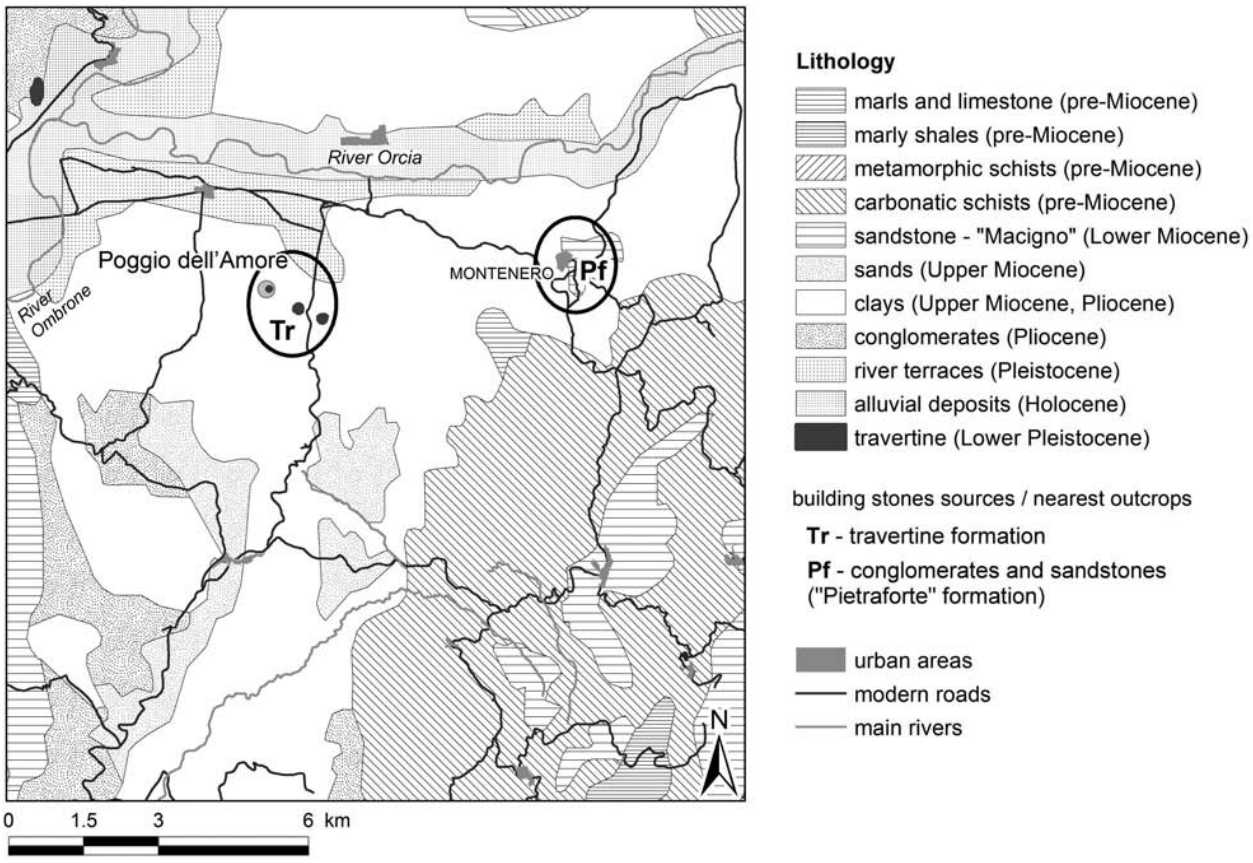


Fig. 7.15 Poggio dell'Amore, map showing nearest geological outcrops of building stones (AA).

again, the near-absence of faunal materials, limited to 4 teeth (from sheep/goat) and 2 small limb bone fragments (from mid-sized taxa) suggest very little food waste accumulated on the site. Although the raw numbers of such finds was probably reduced by the site's poor preservation, the general similarities with San Martino point to a similar periodic, versus constant, use.

The similar botanical signature of both sites is particularly striking, not least the indicators for nearby pasture and pasture animals. Particularly significant are the presence in both pollen and macroremains of the Fabaceae group, which suggest both local legumous fodder fields and, just as importantly, small quantities of those crops being brought into the structure itself in the form of *Melilotus, Trifolium*, and grasses. Likewise, common to both are the presence of fungi, particularly coprophilous fungi, that are indicators of dung. Although the overall quantities are lower at Poggio dell'Amore, again it seems likely that this small structure periodically housed animals.

Here, however, there is somewhat more faunal evidence to present a case for occasional animal stabling, but, even then, such must be considered alongside perhaps a more mixed, flexible scheme of human/animal occupation or use of the structure. The four ovicaprid molar teeth which comprise the only faunal remains (by NISP count) derive from adult individuals. Although none of these teeth registers definitive evidence of pre-mortem loss or extraction, this need not exclude a scenario where the odd tooth from the occasionally sheltered or birthing animal got otherwise incorporated into deposits and floor surfaces created at the site. The fact that only ovicaprids are represented at the site, even if in very small numbers, moreover, presents a stronger case for pastoral activities, as opposed to husbandry ventures favoring cattle or pigs. In this respect, the faunal evidence for Poggio dell'Amore aligns with paleobotancial data from the site that suggests a predominance of pasture and fodder resources, presumably for sheep/goat pastoralism.

Nevertheless, it is important to be cautious in extrapolating too much from the zooarchaeological data. While occasional stabling of animals may have occurred, excavated contexts (both inside and outside the structure) were predominantly devoid of faunal waste. Consequently, arguments must largely depend on negative evidence. This relative lack of zooarchaeological materials cannot be attributed solely to taphonomic conditions, but also cultural issues. One might expect such an absence if occupants maintained cleaner surfaces and floors. If the structure held some sort of mixed-use function like co-habitation (even if temporary) between human and animals, it appears waste was discarded in an efficient manner, keeping living and working surfaces clear. Similarly, any faunal remains potentially associated with food processing and cooking also do not register in any significant fashion at the site because they too have been removed, and, it seems, perhaps to areas further afield given the relative dearth of materials both inside and outside the designated structure at the site.

Despite the similarities with San Martino, there are important differences that reveal something of the variety within these isolated work huts. Most importantly, the two sites probably did not overlap chronologically: the large quantities of Italic sigillata at Poggio dell'Amore and the near absence of these, except in the plow soil at San Martino indicate that the former was built around the time the later was abandoned, the first half of the 1st c. AD.

Those same ceramics, half of the total count by MNI, plus the small collection of glass, point to activities centered more on dining than on cooking versus San Martino, and using a relatively sophisticated material apparatus. Although one or both of the cuts outside the hut were tentatively interpreted as seats for dolia or other storage, no dolia were found and only one amphora fragment describes minimal storage here. Overall, then, the material profile speaks more clearly to short-term stays, potentially together with animals, even if the activities during those stays used a somewhat more refined material apparatus.

Finally, the botanical environment here, although only 1 aerial km from San Martino, displayed important differences. Here at Poggio dell'Amore, where the land was more variegated and less homogeneously suited for cereal crops, we actually find better evidence for nearby cereal fields, which may have been on the large river terraces close by to the NE. In part, this may be due to the better drainage here that made soils easier to plow but it may also simply be a product of individual agency. Pollen spectra from this site include a great biodiversity of floating plants: *Nymphaea, Nuphar, Lemna, Potamogeton, Myriophyllum*,

Sagittaria. These point to standing water nearby and the likelihood that the modern *fontone* was in existence during the Roman period. The presence of this pool, an optimal watering hole, may have motivated the construction of this small hut periodically used for animal stabling.

8

Colle Massari

8.1 Situation (AA, MG)

Colle Massari is located in the SW part of the *comune* at an altitude of ca. 255 m asl, in the rolling/hilly reliefs of Miocene–Pliocene conglomerates[1] alternating with bands of fine sand and clay (Figs. 8.1 and 8.2). The site lies in a field bounded by two deep ditches carrying spring seepage and surface run-off, one to the E (Ditch 1) and another (Ditch 2, dry in the summer) to the W, while its N edge is bounded by the country road Strada della Cave.

The property is currently part of the large estate of Colle Massari, dedicated to oil and wine production. The site is located ca. 350 m to the NW of Case Nuove (Ch. 5), and ca. 200 m to the SE of the major villa in the region, Santa Marta. A site of uncertain function, perhaps a necropolis of late Republican date, was pointed out to us by Giuliano Guerini in the vineyard on the opposite site of the Strada delle Cave. Thus, along with Case Nuove, the site was chosen for excavation in part to test peasant lifeways in the vicinity of a large villa.

8.2 Remote Sensing (MG)

Ghisleni's survey of 2007 had revealed two diffuse scatters of Roman tiles—one in the angle between the Strada delle Cave and Ditch 1 (TU 358 measuring approximately 12 x 9 m), and a second in a natural micro-depression running roughly N/S also between the road and Ditch 1 (TU 359), measuring approximately 27 x 17 m (Figs. 8.2 and 8.3). These two scatters lay in uncertain relationship with each other and with other, better defined but more distant sites, and both yielded very sparse remains (0–1 sherd/m^2 in UT 359) (Ghisleni 2010).

Both were tentatively labeled "off-site scatters," typically poorly defined, small and/or diffuse scatters of archaeological material whose lack of boundaries and/or small size does not permit the attribution as "site." Various interpretations of these "off-sites" have been proposed: products of ancient manuring practices (Bintliff and Snodgrass 1988), larger but eroded, recycled, or destroyed sites (Pettegrew 2001; Fentress 2009), or the remains of particularly small/productive sites (Cherry, Davis and Mantzourani 1991:50–52, 472; Haas 2012, and see Ch. 2). To our knowledge, no one has attempted to verify these proposals through excavation. For the latter possibility that "off-sites" might represent the poorest peasant houses or worksites, we undertook to excavate both off-site scatters.

Magnetometry survey was carried out in both areas with an Overhauser GEM in walking mode along two 30 x 20 m and 50 x 30 m grids in TU 358 and 359, respectively (Fig. 8.3). No alignments or another significant anomalies were found in TU 358, while the

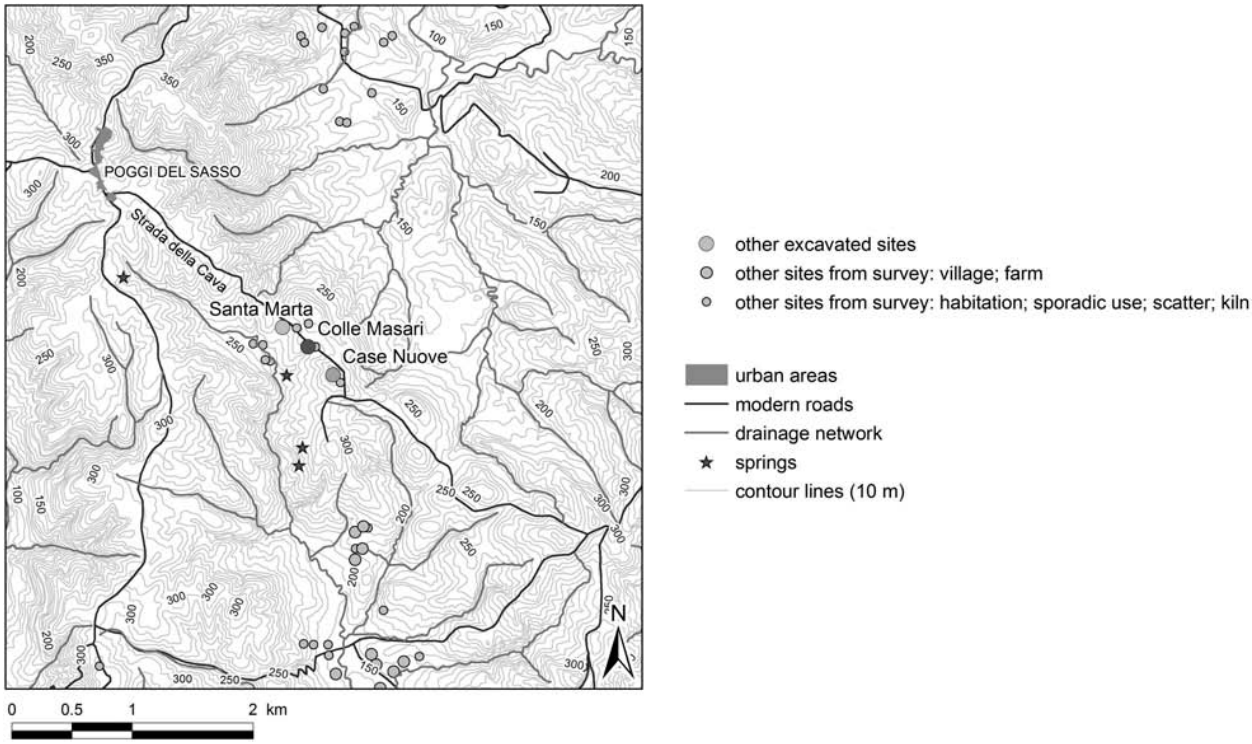


Fig. 8.1 Colle Massari Romano, general topography, Roman sites and springs (AA).

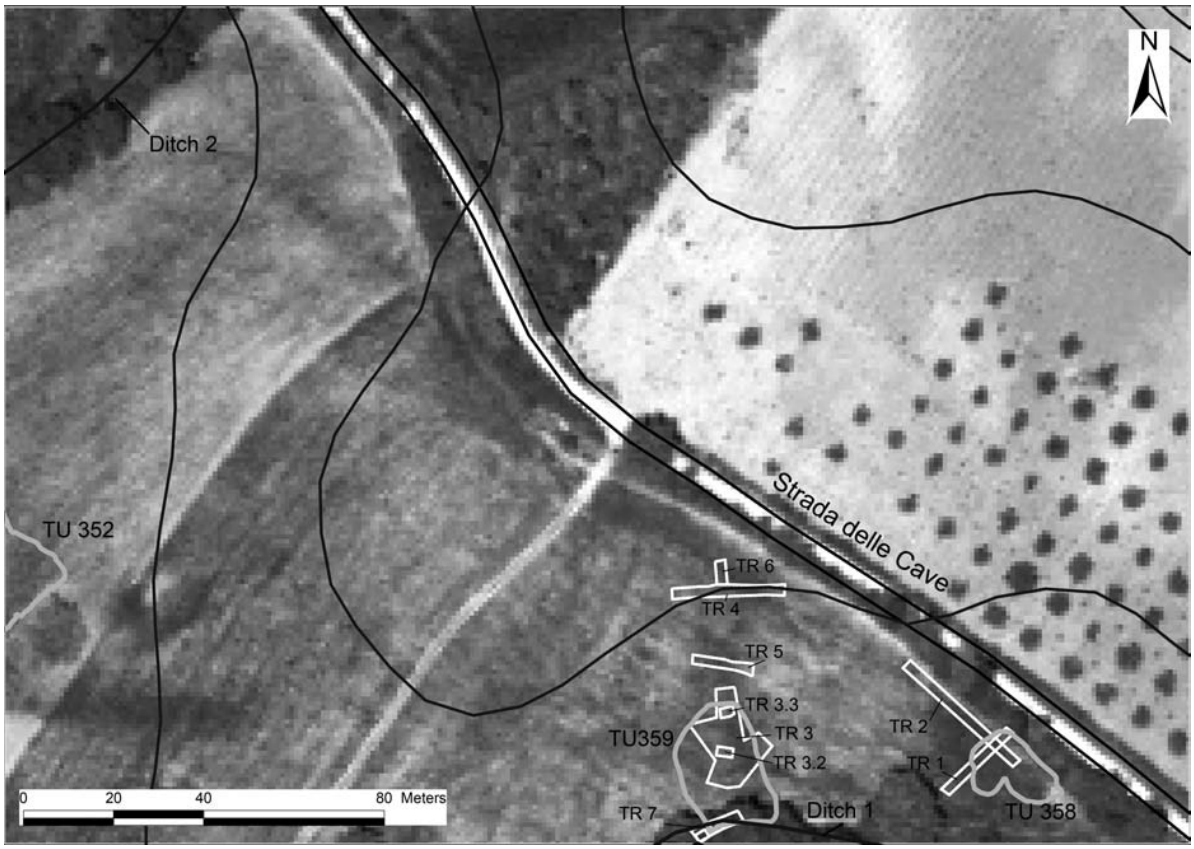


Fig. 8.2 Colle Massari Romano, location of scatters and trenches against aerial photograph (ERZ/MS).

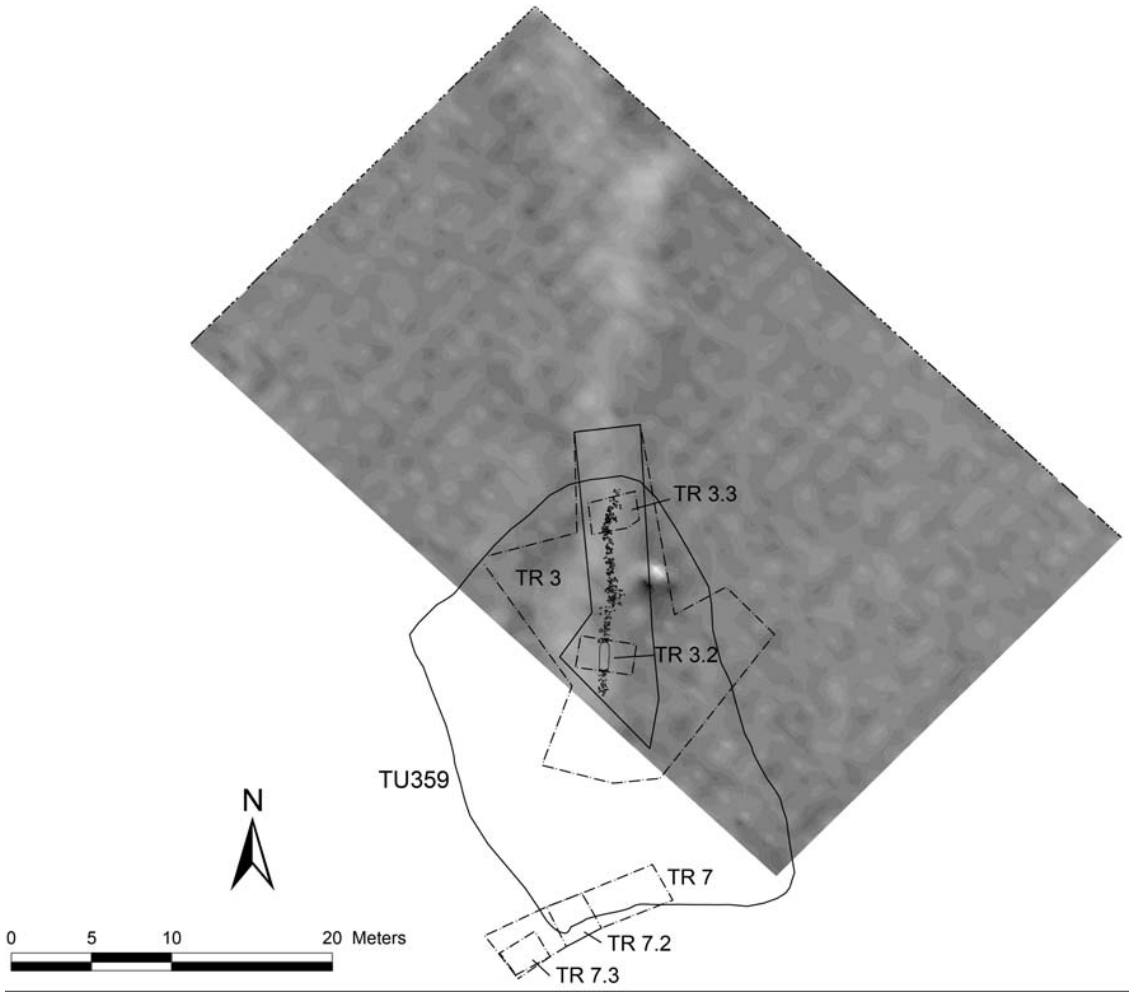


Fig. 8.3 Colle Massari Romano, remote sensing results, overlaid with excavated remains, Trenches 3 and 7 (ERZ/MS).

area of TU 359 revealed a 40 m long linear feature following the line of the small depression and running roughly N/S. At the N end, the anomaly seemed to branch in a "Y," while at its S end a stronger dipole was located on its E side.

8.3 Excavation (KB)

Excavation took place in two separate areas corresponding to TU 358 (Trenches 1–2) and TU 359 (Trenches 3–6) (Figs. 8.4–8.6). Trenches 1 and 2 produced no archaeological remains. A concentration of cobbles in Trench 1 was probably of geological origin. These two intersecting trenches excavated with the bulldozer revealed modern vegetation some 0.80–1 m in depth, suggesting that the area had been disturbed. One of Colle Massari's employees claimed that major earthmoving had taken place in this area in the 1970s, a fact denied by the current and previous landowners. Regardless, because the areas showed signs of modern disturbance, the excavation in Trenches 1–2 was abandoned.

Excavations in Trench 3 were more fruitful, revealing an N/S line (SU 7005) of small (10–15 cm maximum diameter) cobbles, broken tiles, and occasional ceramics, laid into a U-shaped cut (ca. 0.3 m) in the natural clay (SU 7023). (Figs. 8.4–8.6). The cobbles ranged in size from 2 cm to 15 cm, a mixture relatively consistent from top to bottom with no obvious foundation. To the E were found portions of the collapse of this feature atop a level of grey loam (SU 7004), suggesting

Fig. 8.4 Colle Massari Romano, overall view of site from S, showing SU 7005. (Paolo Nanini, by kind permission of the Soprintendenza per i Beni Archeologici della Toscana) (PN).

that the feature's original elevation extended above ground level, represented by SU 7004. The feature followed the natural micro-depression (described above), running downslope and terminating approximately 10 m from the edge of Ditch 1. It also aligned with the linear anomaly indicated by the geophysics. However, while the geophysics indicated a feature some 40 m in length with a Y-branching towards the top of the hill (see Fig. 8.3), the stone/tile feature we uncovered was only some 13 m in length, ending towards the N end of Trench 3. Attempts to find its continuation upslope in Trenches 4–6 failed, suggesting that the seemingly homogeneous geophysical anomaly actually represented two anomalies of different types—the man-made stone/tile feature to the S, and a possible natural anomaly, perhaps a bifurcated paleo-channel, to the N—and that the two joined mid-slope.

Give its location at the bottom of the micro-depression, its alignment parallel to that depression, its U-shaped cut and the consistent mixture of cobbles top to bottom, we have identified this feature as a drain. The fact that it stood above what appears to be the contemporary ground level suggests it may have also served as a field boundary.

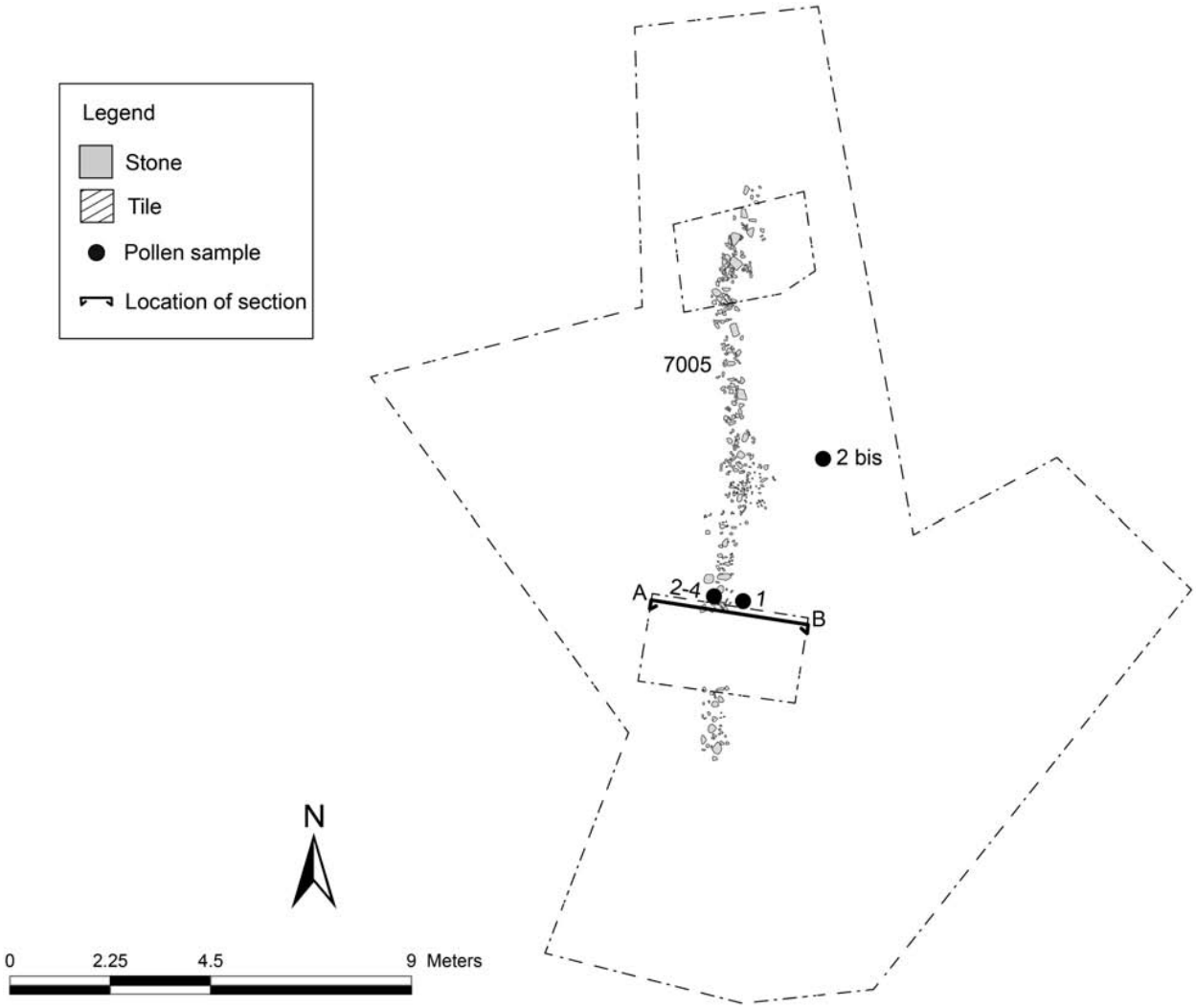


Fig. 8.5 Colle Massari Romano, plan of SU 7005 (ERZ/MS).

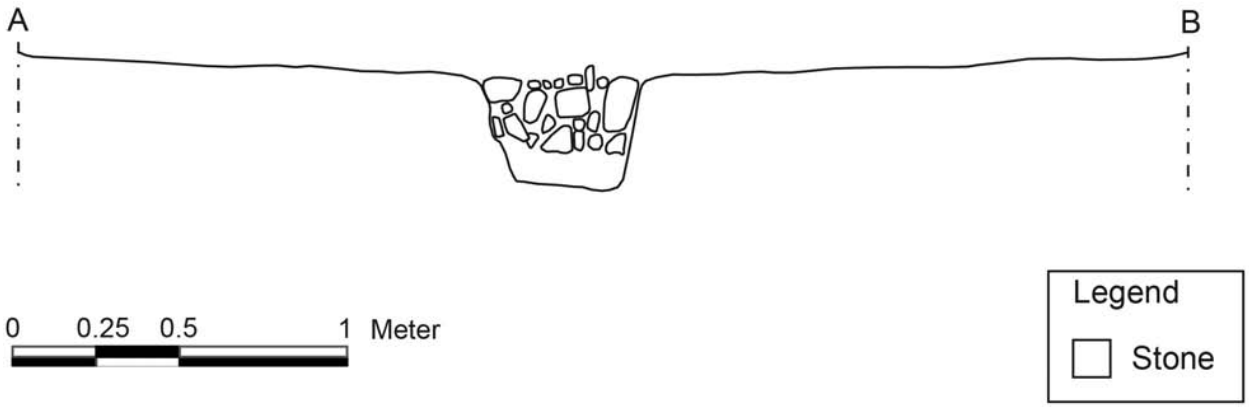


Fig. 8.6 Colle Massari Romano, section through SU 7005 (ERZ/MS).

Table 8.1 Colle Massari Romano, major excavated contexts with diagnostic ceramics/dates (EV).

Context	Chronological Information: Pottery	Total MNI	Possible date	Reliability
7005	Italic sigillata, Conspectus 22	1	Augustan-Tiberian	Poor
7002	Amphora, Spello "family"; cooking bowl/lid with pointed lip	1	Late Republican–early imperial	Poor

8.4 Chronology (EV)

Chronological material was limited to three datable ceramic sherds (Table 8.1). A tiny worn fragment of a possible cup Conspectus 22 in Italic sigillata (SU 7005) (Fig. 8.7.1) dates from the Augustan to Tiberian periods, while the handle fragment of an amphora referable to the Spello family (SU 7002) (Fig. 8.7.6) offers a very generic date between the Julio-Claudian period and the 2nd c. AD. The date ranges for this admittedly lacunose group intersect around the early 1st c. AD.

8.5 Ceramics (EV)

Ceramics at Colle Massari Romano consisted of a total of 146 potsherds, together with larger number of tiles and bricks (234 fragments) (Table 8.2 and Fig. 8.7). All showed the heavy wear and abrasion consistent with being used as part of the fill of a drain. The number of diagnostic sherds was very low and accounts for only 13 sherds or 11 MNI. As all the materials must have been moved as fragments to Colle Massari from one or more rural sites in the hinterland (the villa of Santa Marta seems to be a good candidate, although other small Roman sites were identified by Ghisleni's survey in the same area), functional analysis would be essentially useless. Finally, it is worth noting the presence of a loom weight, here clearly used as building material.

Table 8.2 Colle Massari Romano, ceramic classes by MNI and % MNI of diagnostics (EV).

Ware	Colle Massari Romano (13 diagnostics/11 MNI)
BGW	0 or 0%
Italic sigillata	1 or 9.09%
Thin walls	0 or 0%
Experimental sigillata	0 or 0%
ARS	0 or 0%
Color-coated ware	0 or 0%
SCT	0 or 0%
Late Italic sigillata	0 or 0%
Coarse ware	2 or 18.18%
Kitchen ware	5 or 45.45%
Tunisian kitchen ware	0 or 0%
Amphorae	2 or 18.18%
Coarse ware/amphorae	0 or 0%
VRI	0 or 0%
Dolia	0 or 0%
Lamps	0 or 0%
Loomweights	1 or 9.09%
Amphora stopper	0 or 0%
Other ware (*tubuli*? and kiln spacers)	0 or 0%
Thin walls/coarse ware	0 or 0%
Color-coated ware/coarse ware	0 or 0%

8.6 Faunal Materials (MM)

The site was essentially clean of faunal materials. One molar fragment of a sheep/goat was bleached and exposed, probably representing secondary deposition. Aside from a few unidentifiable fragments, no other materials were found here.

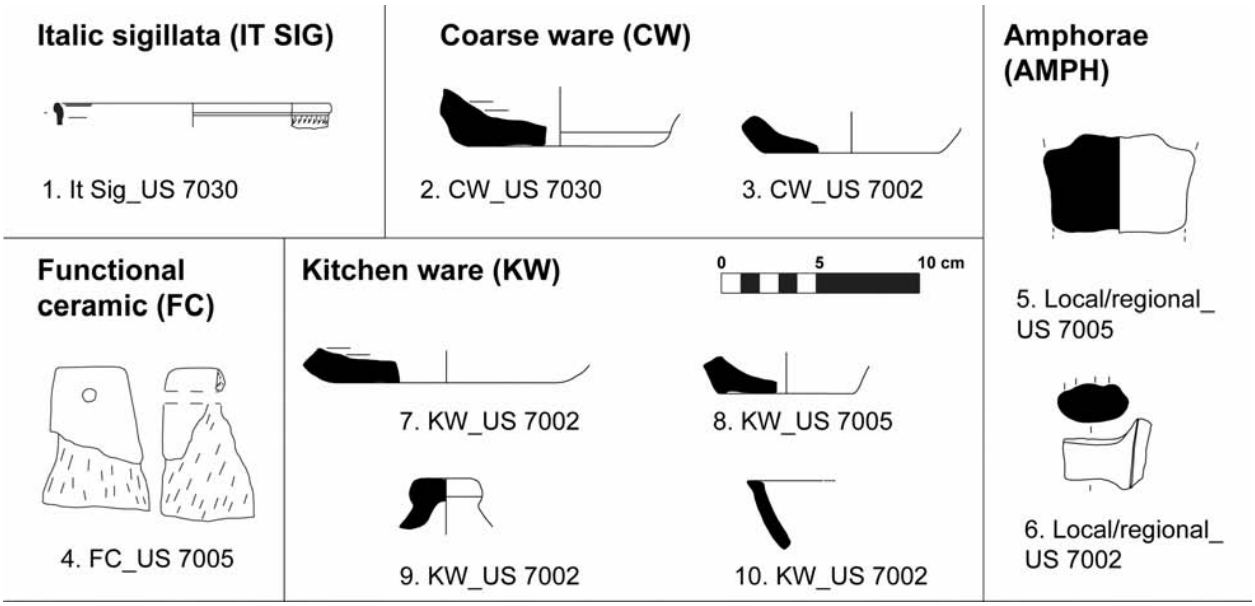


Fig. 8.7 Colle Massari Romano, representative diagnostic ceramics from SU 7002, 7030, 7005. Italic sigillata (IT SIG): 1. Bowl Conspectus 22. Coarse ware (CW): 2–3. Jugs. Functional ceramic (FC): 4. Loomweight. Amphorae (AMPH): 5–6. Local/regional types. Kitchen ware (KW): 7–8. Cooking pots; 9. Lid; 10. *Tegame*/cooking pan (EV).

8.7 Botanical Materials (AAM, ER, RR)

A total of 7 pollen samples and 4 samples for macroremains were collected and treated (Table 8.3). Pollen samples were taken from two different points: four samples from inside the drain in Trench 3 and two samples from the N section of Trench 5, above Trench 3, where the original seepage point was located (see below). One sample of surface soil sample was also studied to compare the past with current pollen rain of the sites. Sediments for the macroremain flotation were taken from SU 7028, 7029, 7003, and 7005.

A total of 3,089 pollen grains (441 p/sample), 594 NPPs, 255 microcharcoals, and 0 seeds/fruits were counted. The archaeological samples have similar medium/low concentration values, ranging from 4,466 p/g to 899 p/g. Preservation was fairly poor in the Trench 5 samples, while it was better preserved in the other samples. Secondary pollen (after erosion of the original sedimentary deposits and redeposition in other sediments) was quite common suggesting some reworking and waterborne transportation.

Landscape and Woodland Composition: The total number of taxa (95) was high, demonstrating good plant diversity. The AP/NAP ratio was on average 20/80, very low for the region and even lower (AP=10%) in the samples from Trench 5. In P1 (pre-drain sample), forest cover value is higher (AP/NAP=32/68). From this pre-drain sample, *Quercus* deciduous (17.6%) is the most represented tree, followed by *Pinus* (3.3%). Interestingly, the Mediterranean shrubs *Helianthemum* (3.1%) and *Erica arborea* cf. (1.2%) also have significant values. Thus, it is possible that the time of construction of the drain, woods and woody plants were closer to the site and more prevalent. In the drain samples not only do AP/NAP ratios go down to 18/82, but the dominance of oak over pine also changes, with *Pinus* and *Quercus* approaching equal levels.

In the archaeological samples, the most represented trees are *Quercus* (10%, including deciduous *Q.* cf. *cerris*), and *Pinus* (6.2%). The only tree of economic interest is *Olea* (0.1%) that was found with low percentages in two samples (P4 and P2 bis).

Wet environments: Surprising for a drain site, wetland plans were relatively low, with only 5% on average and no evidence (except for Cyperaceae) found in Trench 5, the supposed seepage point. The highest percentage was found in the pre-drain samples (CM11/1 and CM11/2), with ca. 3%, mainly *Alnus* and *Populus*. Besides the trees (*Alnus, Salix*, and *Populus*), there are small percentages of helophytes

Table 8.3 Colle Massari Romano, pollen analysis (AMM/ER).

COLLE MASSARI Percentage pollen spectra											
Sample (CM11)			***P2***	***P2bis***	***P3***	***P4***	***Ptr2/2***	***Ptr2/3***	***P1***	***Mean (inside drain)***	***Mean pollen spectrum***
Stratigraphic Unit			7003 (Trench 3)		7024 (Trench 3)		Trench 5		pre-drain (near-site)		
Depth (cm)					27	10					
Pollen concentration (p/g)			**1314**	**1932**	**2208**	**4466**	**899**	**2103**	**2806**	**2154**	**2247**
BETULACEAE	*Alnus* indiff.	Wt		0.4	0.4	1.1			2.0	0.3	0.6
	Alnus cf. *glutinosa*	Wt				0.6				0.1	0.1
	Carpinus betulus	Ow	0.2							0.0	0.03
	Corylus	Ow	0.2		0.8	0.2			0.2	0.2	0.2
	Ostrya/Carpinus orientalis	Ow	0.6		0.2					0.1	0.1
CISTACEAE	*Helianthemum*										
ERICACEAE	*Erica arborea* cf.	Md									
FABACEAE	Ulex type		0.2							0.0	0.03
FAGACEAE	*Castanea sativa*		0.6							0.1	0.1
	Quercus cf. cerris	Ow			2.4	0.6			2.4	0.5	0.8
	Quercus deciduous	Ow	13.0	11.6	10.2	4.8	4.4	3.3	17.6	7.9	9.3
	Quercus ilex type	Md			2.6					0.4	0.4
	Fagus		0.6	0.6	0.4					0.3	0.2
MALVACEAE	*Tilia*	Ow							0.6		0.1
JUGLANDACEAE	*Juglans*				0.2			0.4		0.1	0.1
OLEACEAE		Ow			0.4	0.2	0.4			0.2	0.1
	Olea europaea	Md		0.4		0.2				0.1	0.1
PINACEAE	*Abies*		0.4	0.6	0.2	0.2			0.6	0.2	0.3
	Picea								0.2		0.03
	Pinus		7.6	11.6	3.2	3.9	5.2	5.6	3.3	6.2	5.8
RHAMNACEAE	*Rhamnus*		0.4		0.8					0.2	0.2
ROSACEAE	*Prunus*				0.4	0.2			0.8	0.1	0.2
SALICACEAE	*Populus*	Wt	0.6			0.2			0.4	0.1	0.2
	Salix	Wt	0.8							0.1	0.1
ALISMATACEAE	*Alisma*	Wh	0.6		0.6					0.2	0.2
	Sagittaria	Wh		0.6					0.2	0.1	0.1
AMARANTHACEAE	*Atriplex*				0.6					0.1	0.1
	Chenopodium		0.2	0.2	0.6	0.2	2.2			0.6	0.5
APIACEAE	*Apiaceae*		1.6	1.2	1.2	0.4	1.1	0.7	1.0	1.0	1.0
ARACEAE	*Lemna*	Wh	0.4						0.6	0.1	0.1
ASTERACEAE	*Artemisia*		0.2	0.2	0.4	0.6	0.4	0.4	1.6	0.3	0.5
	Aster type	LPPl	2.4	1.0	2.0	3.5	6.7	5.9	1.8	3.6	3.3
	Carduus	LPPl			1.2	0.4	1.9	0.7	0.2	0.7	0.6
	Centaurea nigra type	LPPl	0.8	2.4	6.0	8.0	11.5	5.2	1.8	5.6	5.1
	Centaurea jacea					0.6			1.0	0.1	0.2
	Cichorieae	LPPl	25.0	35.6	35.2	47.6	45.2	57.0	13.9	40.9	37.1
BRASSICACEAE	*Brassica* type		0.2	1.6	0.6	1.1			0.8	0.6	0.6
	Brassicaceae indiff.		1.2	0.2	1.0	1.3		1.5	0.8	0.9	0.9
	Hornungia type			0.2						0.0	0.03

Table 8.3 cont'd Colle Massari Romano, pollen analysis (AMM/ER).

COLLE MASSARI Percentage pollen spectra											
Sample (CM11)			***P2***	***P2bis***	***P3***	***P4***	***Ptr2/2***	***Ptr2/3***	***P1***	***Mean (inside drain)***	***Mean pollen spectrum***
Stratigraphic Unit			7003 (Trench 3)		7024 (Trench 3)		Trench 5		pre-drain (near-site)		
Depth (cm)					27	10					
Pollen concentration (p/g)			**1314**	**1932**	**2208**	**4466**	**899**	**2103**	**2806**	**2154**	**2247**
CANNABACEAE	Cannabis		0.2	0.2				0.4		0.1	0.1
CARYOPHYLLACEAE	*Arenaria*			0.4						0.1	0.1
	Caryophyllaceae indiff.			0.6	0.6	0.7		0.7		0.4	0.4
	Silene dioica type		0.2							0.0	0.03
CONVULVULACEAE	*Convolvulus*		0.8	1.6	0.6	0.2	1.9	0.4		0.9	0.8
	Cuscuta europaea type		1.0		0.4				0.2	0.2	0.2
CYPERACEAE	Cyperaceae	(Wh)	5.0	3.2	1.6	2.0	3.0	4.4	6.7	3.2	3.7
DIPSACACEAE	Dipsacaceae		0.8						1.0	0.1	0.3
FABACEAE	*Coronilla*	le				0.2				0.0	0.03
	Dorycnium	le	0.8							0.1	0.1
	Fabaceae indiff.	le	0.6	2.4	0.2					0.5	0.5
	Lotus	le	0.8	0.2	0.8					0.3	0.3
	Trifolium pratense type	le	0.6		1.2	0.2			0.8	0.3	0.4
	Vicia	le	0.4			0.2				0.1	0.1
FABACEAE	*Coronilla*	le				0.2				0.0	0.03
	Dorycnium	le	0.8							0.1	0.1
	Fabaceae indiff.	le	0.6	2.4	0.2					0.5	0.5
	Lotus	le	0.8	0.2	0.8					0.3	0.3
	Trifolium pratense type	le	0.6		1.2	0.2			0.8	0.3	0.4
	Vicia	le	0.4			0.2				0.1	0.1
GERANIACEAE	Geraniaceae		0.6	0.2		0.2				0.2	0.1
IRIDACEAE	*Crocus*				0.2					0.0	0.03
LAMIACEAE	Lamiaceae indiff.		3.2	3.4	1.6	2.8	0.7		3.3	2.0	2.2
	Mentha type		1.2	5.2	0.8	0.6	1.1	0.7	5.3	1.6	2.1
	Salvia		1.0				1.1	0.4	2.4	0.4	0.7
HYACINTHACEAE	*Scilla*		0.4							0.1	0.1
MALVACEAE	*Malva*				0.6					0.1	0.1
NYMPHAEACEAE	*Nymphaea alba* type	Wh	0.2							0.0	0.03
OROBANCHACEAE	*Euphrasia*							0.4		0.1	0.1
PLANTAGINACEAE	*Plantago* indiff.			0.2	0.4		0.4	1.1		0.3	0.3
	Plantago lanceolata type				1.0					0.2	0.1
POACEAE	*Avena/Triticum* group	ce	0.8			1.1		1.1	2.2	0.5	0.7
	Hordeum group	ce	0.6	1.4	2.4	2.4		0.7	2.6	1.3	1.4
	Cerealia indiff.	ce	0.6	0.4	2.0	1.9	2.2	1.5	2.0	1.4	1.5
	Phragmites australis cf.	Wh	0.4		0.8					0.2	0.2
	Poaceae-wild group		5.4	4.6	3.8	1.9	5.9	5.2	5.5	4.5	4.6
POLYGONACEAE	*Persicaria maculosa* type				0.2					0.0	0.03
PRIMULACEAE	*Anagallis*		0.6			0.2			0.2	0.1	0.1
RANUNCULACEAE	Ranunculaceae indiff.	LPPl		0.6		0.6				0.2	0.2

Table 8.3 cont'd Colle Massari Romano, pollen analysis (AMM/ER).

COLLE MASSARI Percentage pollen spectra											
Sample (CM11)			***P2***	***P2bis***	***P3***	***P4***	***Ptr2/2***	***Ptr2/3***	***P1***	***Mean (inside drain)***	***Mean pollen spectrum***
Stratigraphic Unit			7003 (Trench 3)		7024 (Trench 3)		Trench 5		pre-drain (near-site)		
Depth (cm)					27	10					
Pollen concentration (p/g)			**1314**	**1932**	**2208**	**4466**	**899**	**2103**	**2806**	**2154**	**2247**
	Ranunculus type	LPPI	0.6	0.8	1.6	1.1	3.7	1.1	0.4	1.5	1.3
ROSACEAE	*Filipendula*								0.2		0.03
	Rosaceae indiff.		0.6	0.6	0.4	0.6	0.4			0.4	0.4
SAXIFRAGACEAE	*Saxifraga* cf.		0.2							0.0	0.03
SCROPHULARIACEAE	Scrophulariaceae								1.6		0.2
	Solanum nigrum type		0.2	0.6		0.4				0.2	0.2
URTICACEAE	*Parietaria* cf.		0.2							0.0	0.03
	Urtica dioica type		0.8					0.4		0.2	0.2
	Urtica cf. *pilulifera*		1.2					0.4	0.2	0.3	0.3
Unknown/Indet.			11.2	5.0	7.2	7.4	0.4	0.4	9.6	5.3	5.9
POLLEN SUM			**500**	**500**	**500**	**540**	**270**	**270**	**509**	**430**	**441**
NUMBER OF TAXA			**59**	**36**	**47**	**41**	**23**	**27**	**43**		
SUMS											
Arboreal pollen		AP	**26.2**	**25.2**	**22.2**	**12.0**	**10.4**	**9.3**	**32.4**	**17.5**	**19.7**
Non Arboreal pollen		NAP	**73.8**	**74.8**	**77.8**	**88.0**	**89.7**	**90.8**	**67.6**	**82.5**	**80.3**
Mixed oak wood		Ow	**14.0**	**11.6**	**14.0**	**5.7**	**4.8**	**3.3**	**20.7**	**8.9**	**10.6**
Mediterranean trees/shrubs		Md	**0.6**	**0.4**	**2.6**	**0.2**	**0.4**		**1.2**	**0.5**	**0.5**
Wet environments (trees)		Wt	1.4	0.4	0.4	1.9			2.4	0.7	0.9
Wet environments (herbs)		Wh	1.6	0.6	1.4				0.8	0.6	0.6
Wet environments (Cyperaceae)		(Wh)	5.0	3.2	1.6	2.0	3.0	4.4	6.7	3.2	3.7
Wet environments		WE	**8.0**	**4.2**	**3.4**	**3.9**	**3.0**	**4.4**	**9.8**	**4.5**	**5.2**
Cerealia		ce	**2.0**	**1.8**	**4.4**	**5.4**	**2.2**	**3.3**	**6.7**	**3.2**	**3.7**
Legumes/pulses (-fodder)		le	**3.2**	**2.6**	**2.2**	**0.6**			**0.8**	**1.4**	**1.3**
LPPI (-Cich)			3.8	4.8	10.8	14.1	23.7	13.0	5.1	11.7	10.7
LPPI		LPPI	**28.8**	**40.4**	**46.0**	**61.7**	**68.9**	**70.0**	**19.1**	**52.6**	**47.8**

(*Phragmites australis* cf.) and aquatics needing permanent water (*Lemna, Nymphaea alba* type, *Sagittaria*).

Cereal fields: Pollen of cereals is well represented in these spectra (3.7% on average) suggesting that the fields were cultivated in the site. One of the higher values in the study area (6.7%) was recorded in the pre-drain sample P1. *Hordeum* group (1.4% on average) is double than *Avena/Triticum* group and together with Cerealia indiff. are all present in the spectra.

Cultivated woody plants: *Olea* pollen was found only in traces suggesting that this plant was not cultivated near Colle Massari. While scarce, noteworthy is the presence of chestnut (*Castanea sativa,* 0.6% in P2) which is only rarely found in RPP sites. Possibly some *Prunus* and *Corylus* plants were grown for fruits near the site but they are low-producing pollen, and it is hard to evaluate the nature of their presence.

Pastures and fodder: As with the other sites in the RPP, pasture indicators are the most prevalent part of the pollen spectrum. At Colle Massari, this sum includes mainly Cichorieae (37% on average), *Ranunculus* type and Ranunculaceae indiff, and Asteroideae (including *Aster* type, *Carduus, Centaurea*). The pasture indicators have lower values in the pre-drain sample (19% in P1) and then increase in the drain samples (35% on average in P2 and P2 bis; 62% in the other samples). This shift is consistent with a concomitant decrease in cereals with the construction of the drain. Legumes

(1.3% on average), such as those represented by the pollen of *Dorycnium, Lotus, Trifolium*, and Fabaceae indiff., together with part of the Poaceae-wild group, may have been cultivated for fodder. For example, *Vicia* cf. *orobus* (identified within the pollen of *Vicia*) is known to be often cultivated for this purpose. Other herbs are common in pastures or in abandoned fields that can be browsed (such as Brassicaceae and Caryophyllaceae).

Non-Pollen Palynomorphs

Spores and hyphas of fungi, cysts and other elements of algae and zoomicroremains were found in all samples at low levels (Table 8.4).

Fungi (14 morphotypes plus some undifferentiated spores) amounted to ca. 362 NPP/g on average in the archaeological samples. Sordariaceae (40 NPP/g), coprophilous fungi which live on dung, were found in all samples; they are markers of pasturelands. *Chaetomium linaria* and *Chaetomium* cf., indices of fires, were found only in the samples CM11/2, 2 bis (62.5 NPP/g).

Algae (5 morphotypes) concentration were low (134 NPP/g on average). All samples contained HdV181, living at the surface of water bodies, and *Pseudoschizaea*, frequent in seasonally dried ponds (Geel 1986, 2001). In this context, the algae may be indicators of erosional events, or local transport of silt.

Microcharcoals (Table 8.4): Microscopic particles of charcoals >125 µm indicative of local fires, are found in the samples CM11/2, 3, 4, 2 bis. Low values were also observed in the pre-drain sample CM11/1. The concentration in the drain samples is ca. 156 ch/g. A few charcoals of very large size (>300 µm) were observed in drain samples CM11/2, 4.

Macroremains: None were preserved.

8.8 Hydrological/Geological Contexts, Land Units, and Land Evaluation (AA)

Why this area should have merited such a well-constructed, stone-filled drain, was suggested by geoarchaeological analysis of the surrounding area. The micro-area is characterized by the direct contact between the Macigno sandstone and the younger clays and fine sands (Fig. 8.8). Water tends to collect at such interfaces as multiple small springs, emerging eventually at conglomerate-sand-clay interfaces. Indeed, the surrounding area shows signs of being rich in subsurface water: a few tens of meters downslope from the site a spot of hydrophilic vegetation marked a small natural water outflow, and three modern drains

Table 8.4 Colle Massari Romano, non-pollen palynomorph and microcharcoal analysis (AMM/ER).

COLLE MASSARI Non-Pollen Palynomorphs and Microcharcoals								
Sample (CM11)		***P2***	***P2bis***	***P3***	***P4***	***Ptr2/2***	***Ptr2/3***	***P1***
Stratigraphic Unit		7003 (Trench 3)		7024 (Trench 3)		Trench 5		pre-drain (near-site)
Depth - cm				27	10			
NON-POLLEN PALYNOMORPHS (concentration NPP/g)								
FUNGI	*Amium,* Ascospora (HdV18), *Chaetomium* (HdV7), *Coniochaeta lignaria* (HdV172), HdV205, *Glomus* (incl. *G. fascicolatum*), *Sordaria type,* Sordariaceae indiff., *Valsaria uariospora* type, *Tilletia,*	1089	706	21	77	237	290	117
ALGAE	HdV181, HdV182, HdV492, HdV984, *Pseudoschizaea*	54	284	199	142	0	83	175
ZOOMICROREMAINS	Fragments of invertebrates indiff.	14	20	0	0	0	14	0
	Total Concentration of classified NPPs (NPP/g)	**1157**	**1010**	**220**	**219**	**237**	**386**	**292**
MICROCHARCOALS								
	125–200 µm (ch/g)	163	147	92	180	0	41	44
	201–500 µm (ch/g)	109	98	50	142	0	0	29
	Total Concentration of microcharcoals (ch/g)	**272**	**245**	**142**	**322**	**0**	**41**	**73**

draw ground water away from the nearby Strada delle Cave. Ditch 1 itself, some 10–15 m deep and not completely dry in the summer, must have been formed by such ground water runoff, while the spring of Santa Marta at the base of that ditch is still active.

In the N section of Trench 5, at the top of the drain, a clear depression with a maximum depth of ca. 1.5 m and with gradual lateral transitions was visible (Fig. 8.9). The upper part of the infill was composed of colluvial material similar to that forming the topsoil of Trench 1. In the central and W part of the section, this colluvium overlies a reddish loamy layer (which could be part of the geological substrate) whereas in the E part a whitish substrate layer crops out, composed of a laminated alternation dipping westwards, made up of fine and medium-fine sand and, more rarely, composed of small pebbles (SU 7044). These permeable sandy layers may indicate another, ancient point of water outflow.

It is important to note that while to the N the hill has an 8–9% slope, by Trench 5 and the point of the drain-feature, its slope decreases to 3–4%. Thus, if there were a water outflow above Trench 5, it might have tended to collect on the surface rather than drain naturally. Thus, it seems likely that the drain was built to channel and contain the water coming out from this outflow, directing towards the natural channel of Ditch 1.

Similar to nearby Case Nuove (see Fig. 5.28), the agricultural production potential of the locale is influenced by the transition of the steep "macigno" sandstone ridge to the W against the hilly clay-sand-conglomerate hills upon which Colle Massari is located (Fig. 8.10). The latter are characterized by calcareous soils with discrete water availability that are generally more suitable for crops and tree crops, while the "macigno" yields drier, more acidic soils that are less suitable. The result is a highly variable potential agricultural landscape, with pockets of good land alternating with stretches more suitable for forests or scrub. The predominance of pasture, suggested by

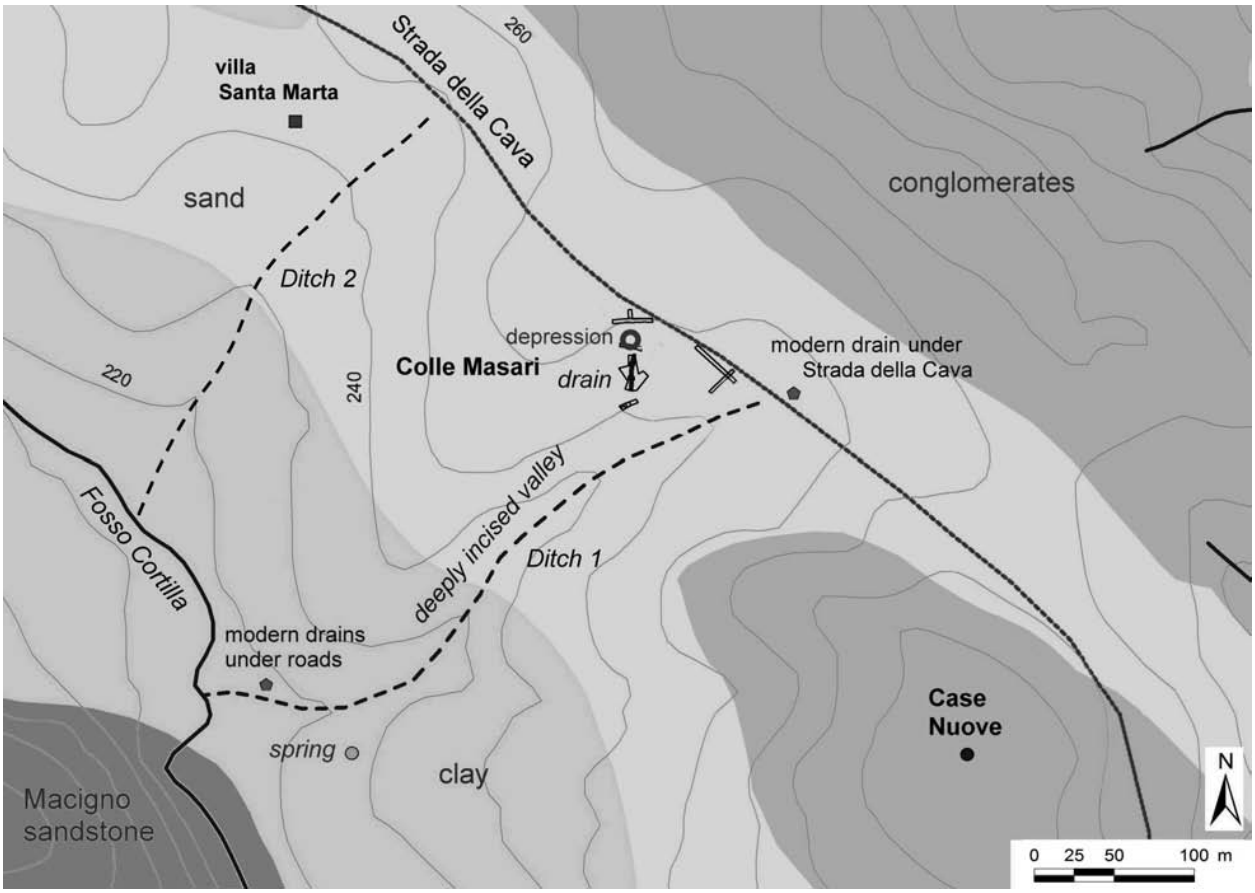


Fig. 8.8 Colle Massari Romano, map of locale showing geological and hydrological features (AA).

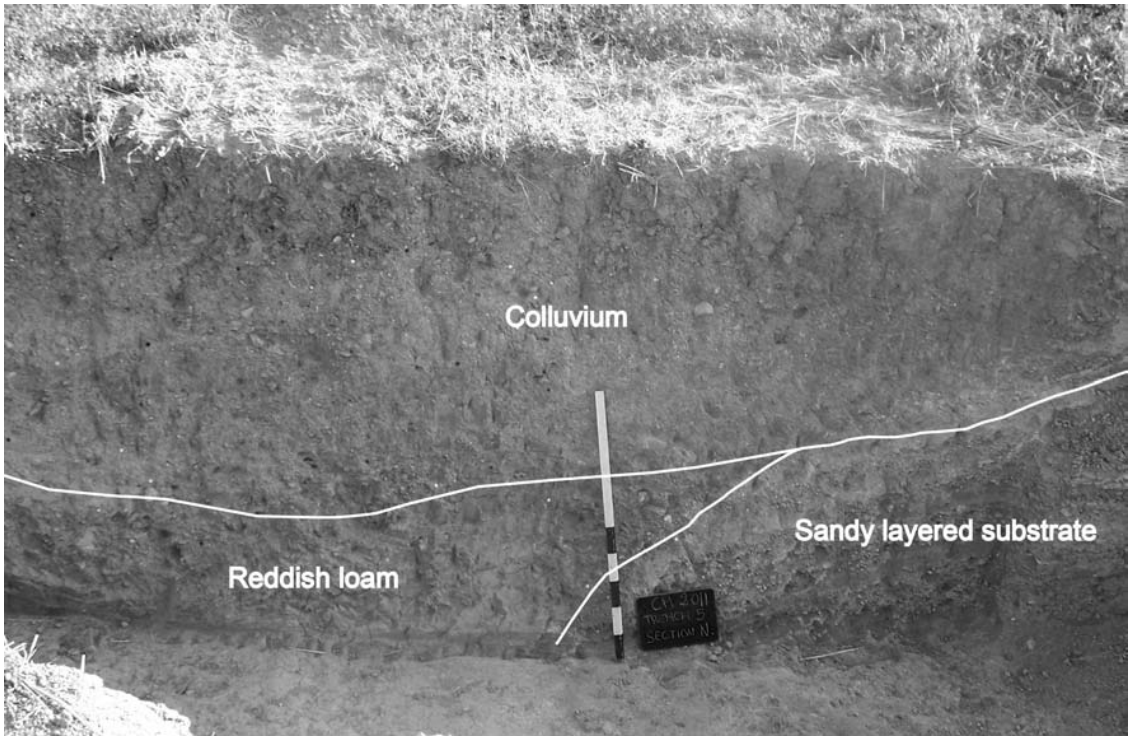


Fig. 8.9 Colle Massari Romano, view of N section of Trench 5, in depression shown on fig. 8, showing geological features (ERZ/MS). (See also color insert.)

the pollen data, indicates that even highly suitable agricultural land near the site (S1 and 2 categories) was probably alternated in use for pasture rather than "high-value" crops.

8.9 Small Finds (SCE)

Topsoil of Colle Massari yielded only one copper alloy fragment, probably a dress pin from SU 7002, whose dating could range from antiquity to the early modern period.

8.10 Building Materials (AA)

The drain at Colle Massari was constructed principally of rounded cobbles of marly limestone, while less common are dark grey blocks of marly limestone with crystalline veins. The nearest source for these is the large natural outcrop of the Flysch formation exposed along the Ombrone River near Sasso (see Fig. 5.26), while the cobbles were likely taken from the riverbed. It is unlikely that the cobbles derived from inclusions in the local conglomerate, found around the site: these conglomerate inclusions tend to be significantly smaller than the cobbles in the drain. The "road" distance from the Ombrone outcrop to the site is ca. 6 km.

8.11 Discussion (KB)

Colle Massari represents one of the first ever excavations of scatters identified, for reasons of their extremely sparse remains, as so-called "off-sites." The fact that no archaeological levels were found beneath one of these (TU 358) suggests either that the sparse surface materials were generated as part of road work on the nearby Strada della Cave or, perhaps, represented debris accumulated during the construction of the nearby field drain. Either interpretive scenario adds yet another set of options to those proposed as the origin of off-site materials. The emergence of a field drain beneath TU 359 suggests that small scatters may represent many functions besides living spaces. More importantly than the cautionary against functional determinations from remote sensing data, it provides information about land management in the area.

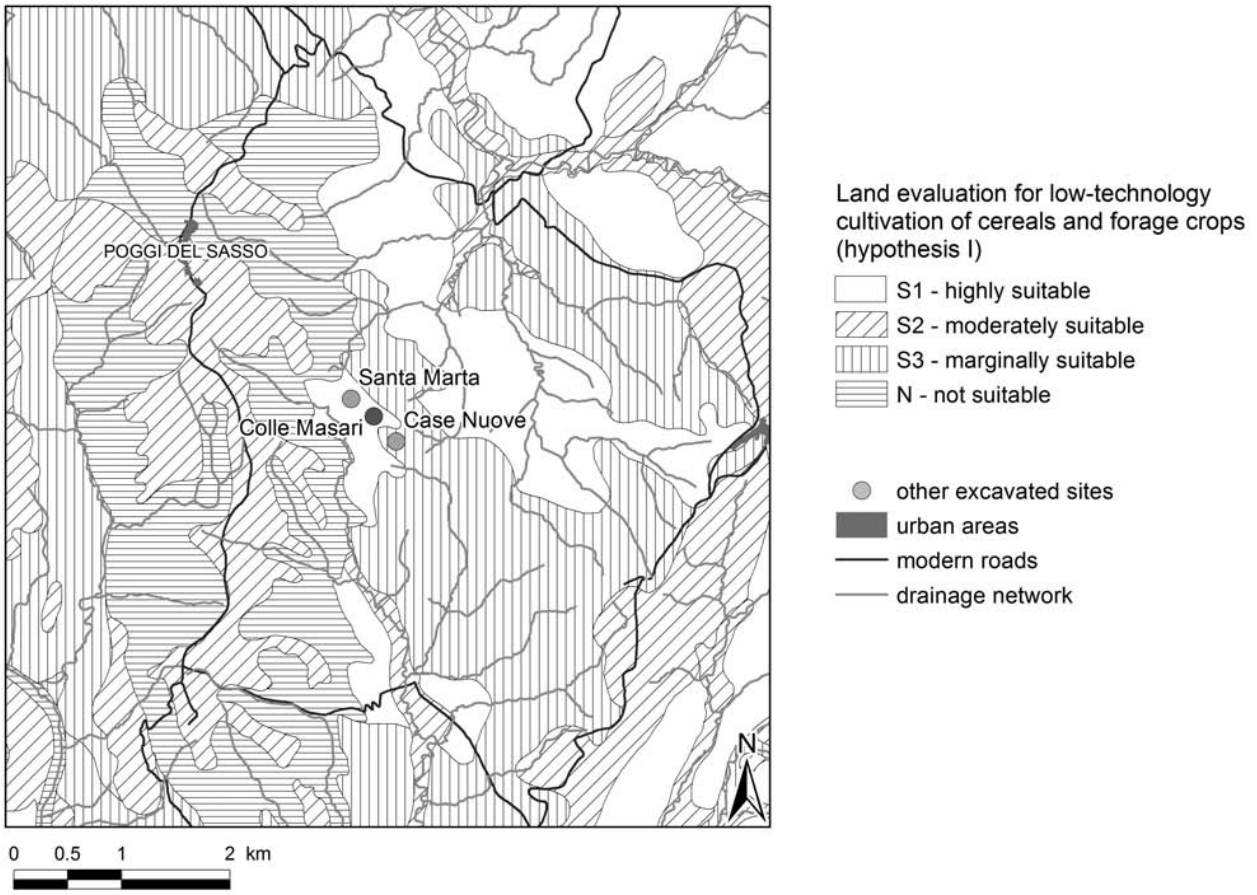


Fig. 8.10 Colle Massari Romano, land evaluation map, hypothesis I (AA).

The geoarchaeological evidence points to a groundwater seepage point at the head of the drain in Trench 5 (see Fig. 8.9). It is strange, but not definitive, that little botanical evidence for standing water was found either in the hypothetical seepage point or the drain. The long construction is nonetheless doubtless a drain, whose robust construction cut into the clay and the transportation of building materials, like the tiles and other ceramics and stones, from a site or sites nearby point to a certain expenditure of effort to drain a hillside. The Colle Massari drain points to a deliberate and careful management of the agricultural landscape and its hydrology.

Judging from the pollen evidence, the drain seems to be inserted into a field where most likely cereals, pasture, and/or legumes, either singly or in rotation, were grown. There is no evidence for specialized cash-crops like grape or olive which might seem to better merit such an investment in land curation.

The date of the drain is not precise enough to relate it with certainty to any specific phases at nearby Case Nuove or Santa Marta. Were it to date to the early 1st c. AD it would coincide with the abandonment of Case Nuove and a restructuring of the Santa Marta villa, but unfortunately its dates are too generic to prove this connection. It may be significant in this regard that, at some point after the drain's construction, local cereal production seems to decrease, pasture increases, and forest cover, already slim, diminishes still further. The drain, therefore, may be part of a general rearrangement of the Santa Marta lands at this time.

NOTES:

8.1 Dated as Upper Miocene on the CARG 10k geological maps of the Regione Toscana, and as Pliocene on the 100k geological map sheet 128 of the Servizio Geologico d'Italia.

Figs. 1.2 and 6.12 Reconstruction of San Martino site (Studio Inklink).

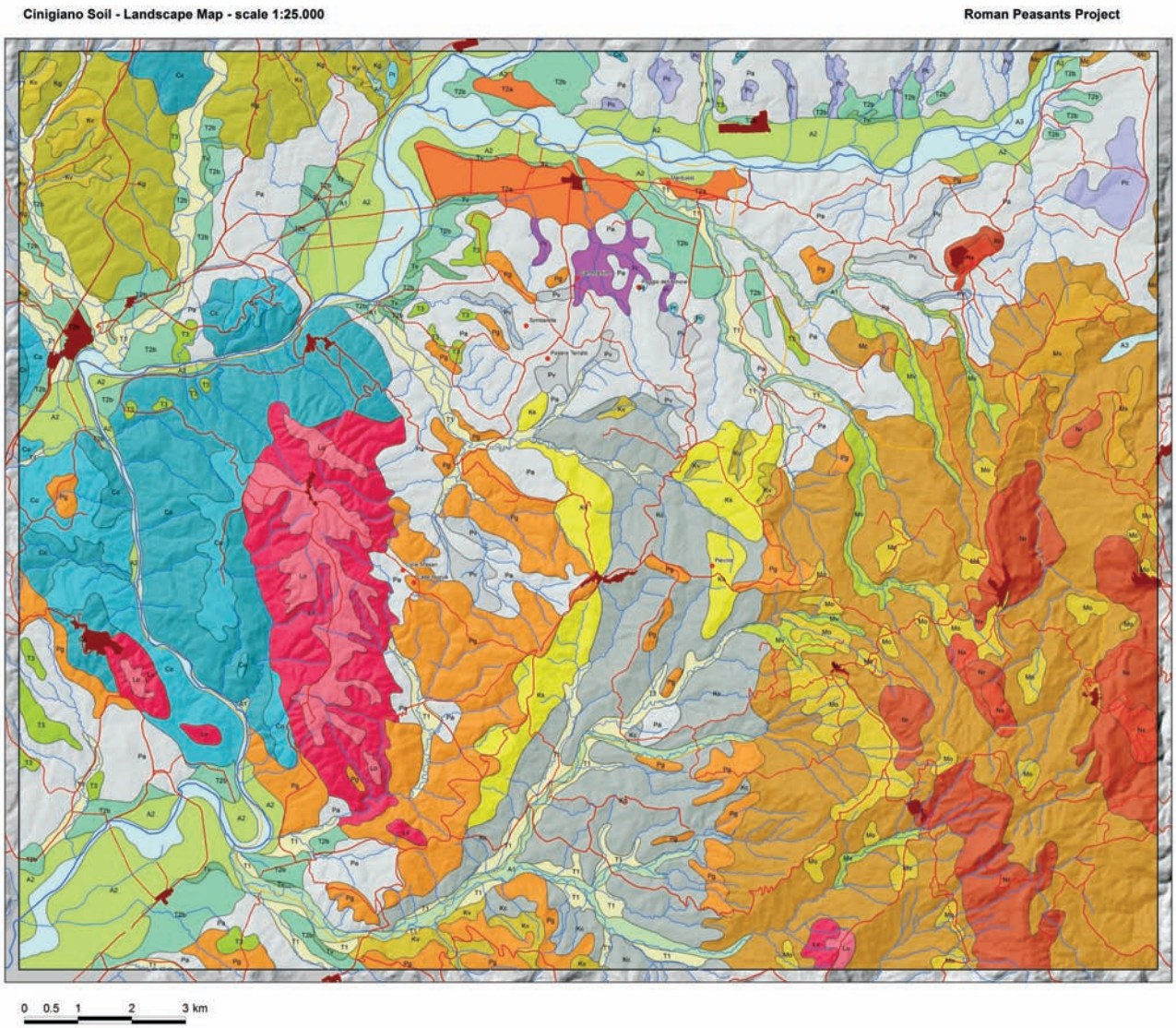


Fig. 3.19 Land units map and abbreviated legend (*facing*) (AA).

SOIL -LAND UNITS (abridged legend)

- Mc = moderately steep schist-carbonatic reliefs ("galestri e palombini", pre-Miocene)
- Mo = idem, undulating, concave
- Mx = idem, undulating, convex
- Mv = idem, very deep valleys
- Cc = moderately steep reliefs in marly shales ("argilloscisti", "alberese", pre-Miocene)
- Co = idem , rolling
- Nr = very steep and steep reliefs in shales and crystalline sandstone, pre-Miocene
- Nx =idem, rolling
- Lo = undulating broad hilltops in sandstone reliefs ("macigno", Lower Miocene)
- Lv = idem, steep to very steep slopes
- Kc = rolling, hilly, clayey in clay marly-conglomeratic landscape (Upper Miocene)
- Ks = idem, fine sandy
- Kg = idem, conglomerates, sand
- Kv = idem, deep valleys, steep slopes
- Pa = rolling, clayey in clayey-sandy-conglomeratic landscape (Mio-Pliocene)
- Pc = idem, rolling, hilly, clayey, strongly eroded (gullies)
- Pv = shallow depressions in Pa
- Pr = fluvial system dissecting Pa down to the level of the T2 terrace
- Pt = idem, travertine outcrops
- Pg = idem, hilly in conglomerates
- T1 = lower level fluvial terraces (Pleistocene)
- T2a = idem, intermediate level with red soils
- T2b = idem, intermediate level with grey soils
- T3 = idem, highest level
- Tv = terrace borders
- A1 =alluvial deposits (Holocene), valley floor of secondary rivers
- A2 = idem, valley floors of the Ombrone-Orcia river system
- A3 = active river bed of the Ombrone-Orcia system (1954)

topography

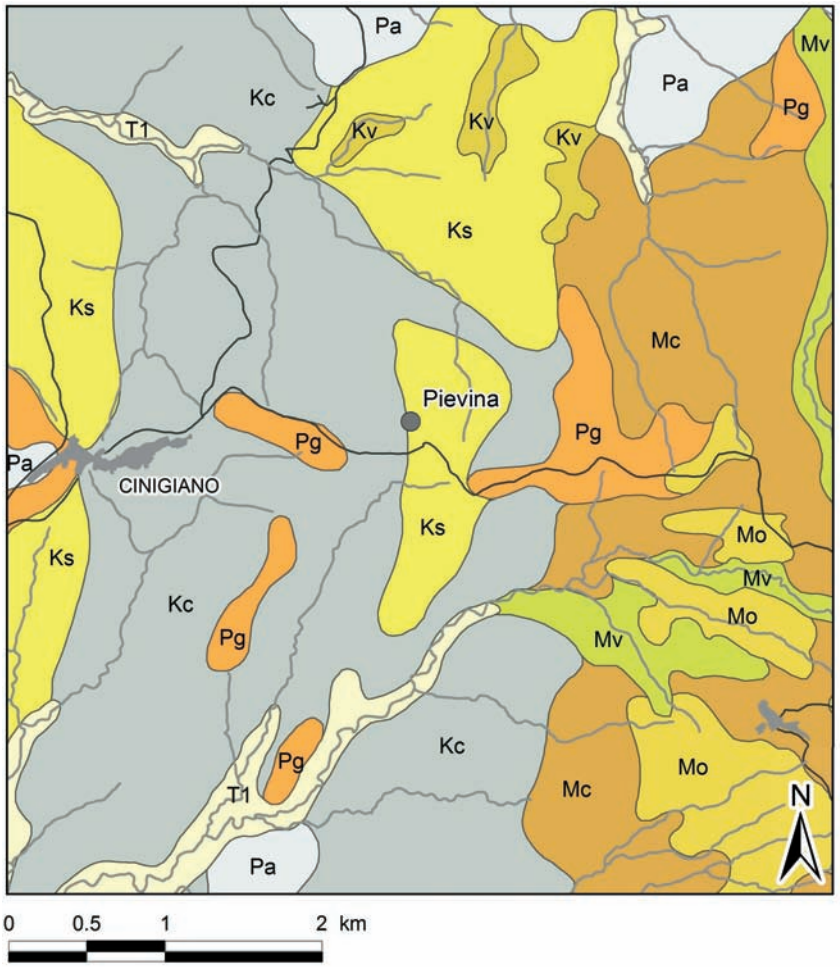
- natural drainage network
- municipality of Cinigiano
- urban areas
- railways
- state roads
- local roads
- provincial roads
- minor roads
- excavated sites

This thematic map pictures the spatial distribution of the Land Units, intended as portions of the territory with homogeneous characteristics as far as soil, substrate, geomorphology and hydrology are concerned.

Questa mappa tematica raffigura la distribuzione spaziale delle unità di terra, intese come porzioni del territorio con caratteristiche omogenee per quanto riguarda il suolo, il substrato, la geomorfologia e l'idrologia.

Author: Antonia Arnoldus-Huyzendveld 2009 - 2012

Fig. 4.11 Pievina, reconstruction of Phase 2.1 (Studio InkLink).



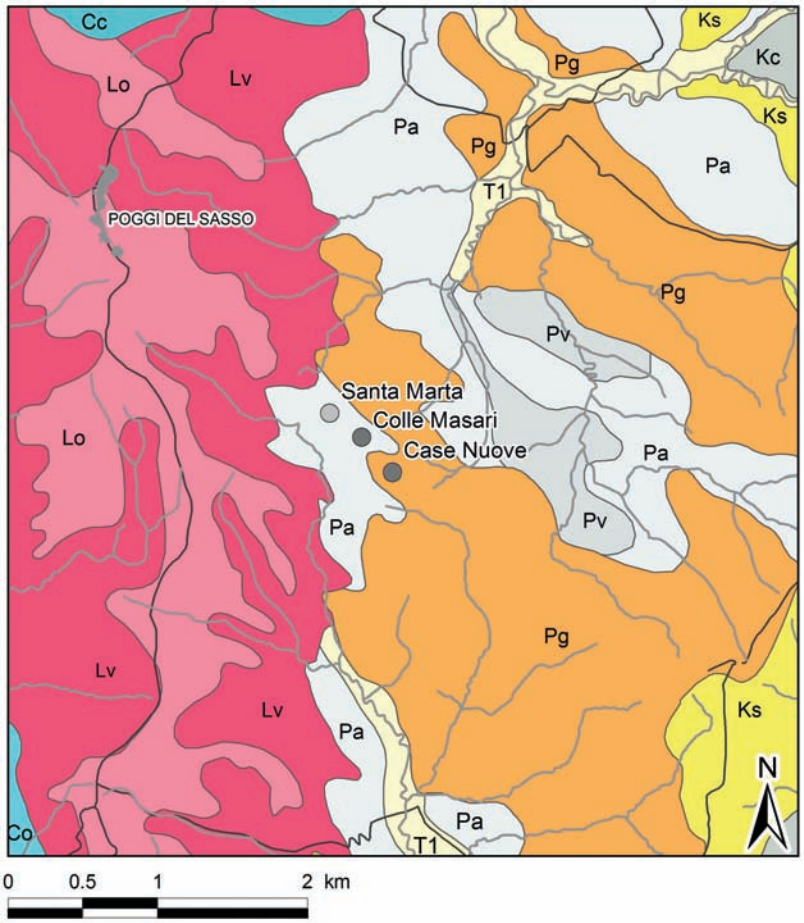
Land Units (concise legend)

- Mc = moderately steep schist-carbonatic reliefs (“galestri e palombini”, pre-Miocene)
- Mo = idem, undulating, concave
- Mv = idem, very deep valleys
- Kc = rolling, hilly, clayey in clay marly-conglomeratic landscape (Upper Miocene)
- Ks = idem, fine sandy
- Kg = idem, conglomerates, sand
- Kv = idem, deep valleys, steep slopes
- Pa = rolling, clayey in clayey-sandy-conglomeratic landscape (Mio-Pliocene)
- Pg = idem, hilly in conglomerates
- T1 = lower level fluvial terraces (Pleistocene)

- urban areas
- modern roads
- drainage network

Fig. 4.20 Pievina, land units map (AA).

Fig. 5.18 Case Nuove, reconstruction of press installation in Phase 1 (Studio InkLink).



Land Units (concise legend)

- Cc = moderately steep reliefs in marly shales (“argilloscisti”, “alberese”, pre-Miocene)
- Co = idem , rolling
- Lo = undulating broad hilltops in sandstone reliefs (“macigno”, Lower Miocene)
- Lv = idem, steep to very steep slopes
- Kc = rolling, hilly, clayey in clay marly-conglomeratic landscape (Upper Miocene)
- Ks = idem, fine sandy
- Pa = rolling, clayey in clayey-sandy-conglomeratic landscape (Mio-Pliocene)
- Pv = shallow depressions in Pa
- Pg = idem, hilly in conglomerates
- T1 = lower level fluvial terraces (Pleistocene)

- other excavated sites
- urban areas
- modern roads
- drainage network

Fig. 5.28 Case Nuove + Colle Massari, land units map of locale (AA).

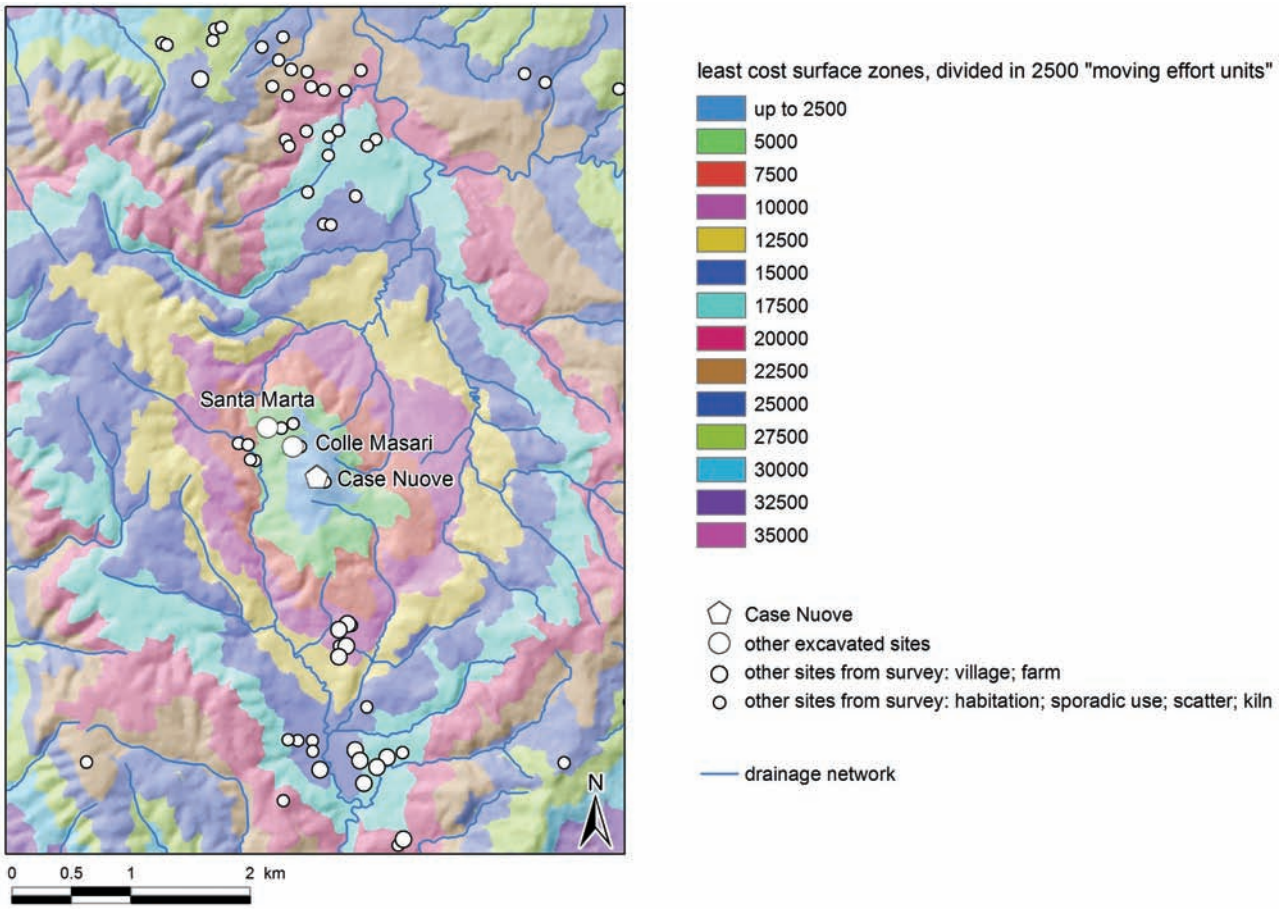
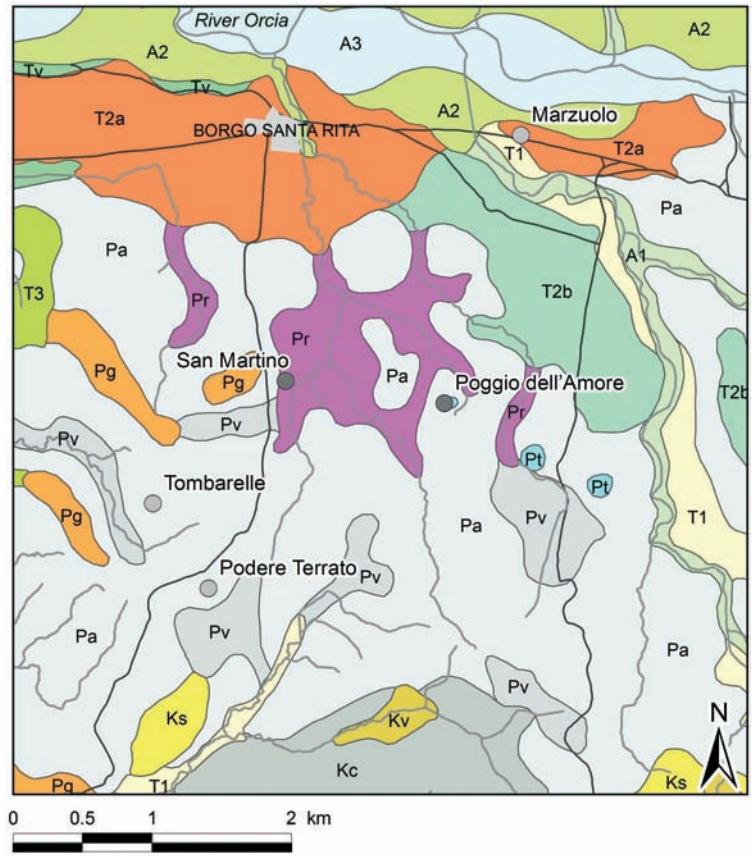


Fig. 5.32 Case Nuove, least cost path analysis for movement from surrounding Roman sites to Case Nuove, plotted as least-cost surface zones representing areas having the same effort-distance (AA).



Land Units (concise legend)

- Kc = rolling, hilly, clayey in clay marly-conglomeratic landscape (Upper Miocene)
- Ks = idem, fine sandy
- Kv = idem, deep valleys, steep slopes
- Pa = rolling, clayey in clayey-sandy-conglomeratic landscape (Mio-Pliocene)
- Pv = shallow depressions in Pa
- Pr = fluvial system dissecting Pa down to the level of the T2 terrace
- Pt = idem, travertine outcrops
- Pg = idem, hilly in conglomerates
- T1 = lower level fluvial terraces (Pleistocene)
- T2a = idem, intermediate level with red soils
- T2b = idem, intermediate level with grey soils
- T3 = idem, highest level
- Tv = terrace borders
- A1 = alluvial deposits (Holocene), valley floor of secondary rivers
- A2 = idem, valley floors of the Ombrone-Orcia river system
- A3 = active river bed of the Ombrone-Orcia system (1954)

- other excavated sites
- urban areas
- modern roads
- drainage network

Fig. 6.7 San Martino + Poggio dell'Amore locales, land units map (AA).

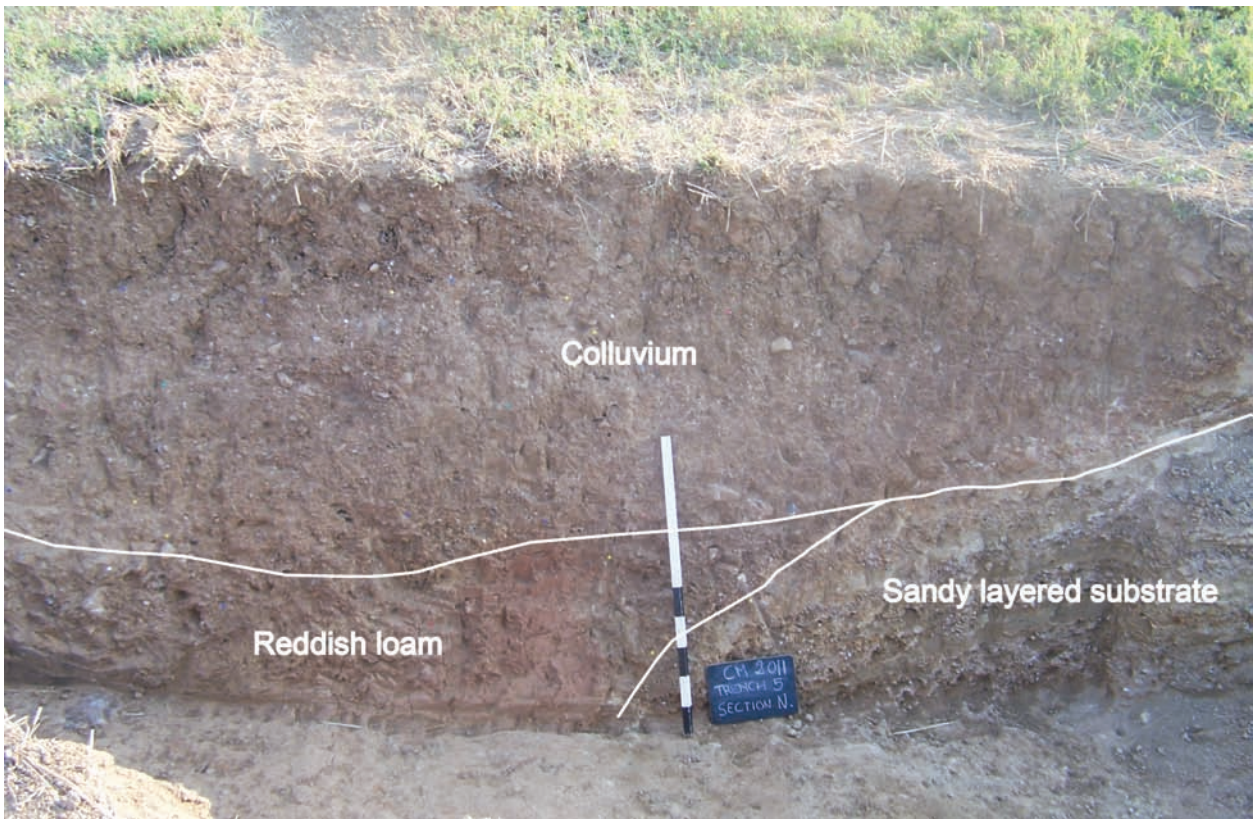
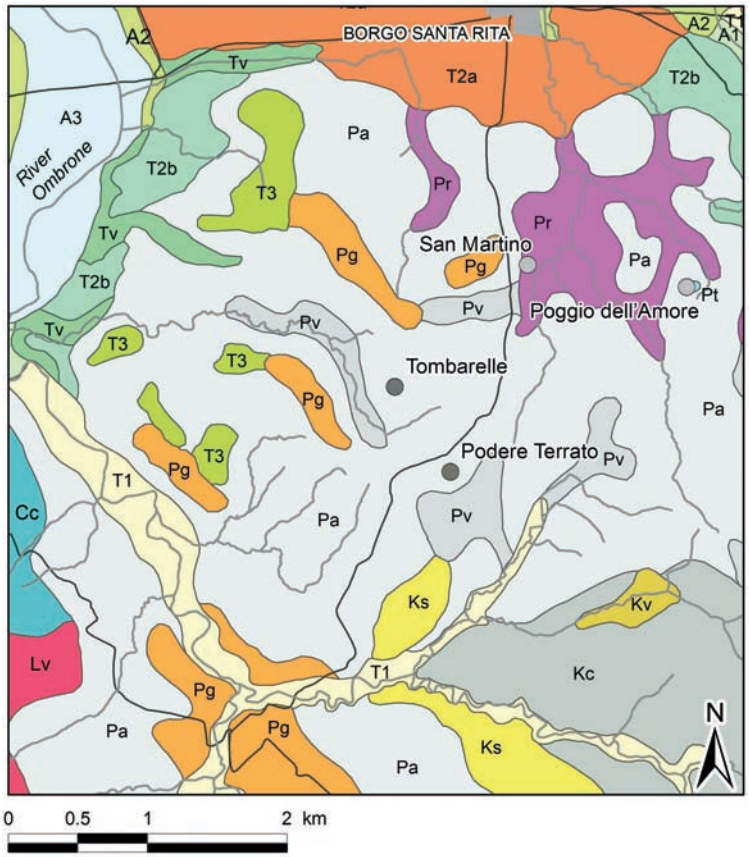


Fig. 8.9 Colle Massari Romano, view of N section of Trench 5, in depression shown on fig. 8, showing geological features (ERZ/MS).



Land Units (concise legend)

- Cc = moderately steep reliefs in marly shales ("argilloscisti", "alberese", pre-Miocene)
- Lv = idem, steep to very steep slopes
- Kc = rolling, hilly, clayey in clay marly-conglomeratic landscape (Upper Miocene)
- Ks = idem, fine sandy
- Kv = idem, deep valleys, steep slopes
- Pa = rolling, clayey in clayey-sandy-conglomeratic landscape (Mio-Pliocene)
- Pv = shallow depressions in Pa
- Pr = fluvial system dissecting Pa down to the level of the T2 terrace
- Pt = idem, travertine outcrops
- Pg = idem, hilly in conglomerates
- T1 = lower level fluvial terraces (Pleistocene)
- T2a = idem, intermediate level with red soils
- T2b = idem, intermediate level with grey soils
- T3 = idem, highest level
- Tv = terrace borders
- A1 =alluvial deposits (Holocene), valley floor of secondary rivers
- A2 = idem, valley floors of the Ombrone-Orcia river system
- A3 = active river bed of the Ombrone-Orcia system (1954)

- other excavated sites
- urban areas
- modern roads
- drainage network

Fig. 9.13 Podere Terrato and Tombarelle, land units map (AA).

Fig. 10.15 Marzuolo, Area I, Trench 1, Italic sigillata from SU 10093 in course of excavation.

Fig. 10.16 Marzuolo, Area I, Trench 1, Italic sigillata from SU 10093 after cleaning.

Fig. 10.51 Marzuolo, Phase 2, details of the Italic sigillata deposit (50–70 AD) US 10093: 1. Stack of Conspectus 3 dishes manufactured by MANNEIVS under excavation; 2. Overview of deposit US 10093; 3. Overfired large dishes Conspectus 20.4 and 21.3 stamped by A.M.VRBANVS; 4. Partially reconstructed stacks of forms (from left to right) Conspectus 4.6.1, Conspectus 34 (two modules) and Conspectus 3.3. Worth noting are the firing defects increasing from the bottom to the top (EV).

1. Stack of Conspectus 3 dishes during the excavation

2. Overview of deposit US 10093

3. Overfired large dishes, Conspectus 20.4 and 21.3

4. Partially reconstructed stacts of forms Conspectus 4.6.1, Conspectus 34 and Conspectus 3.3

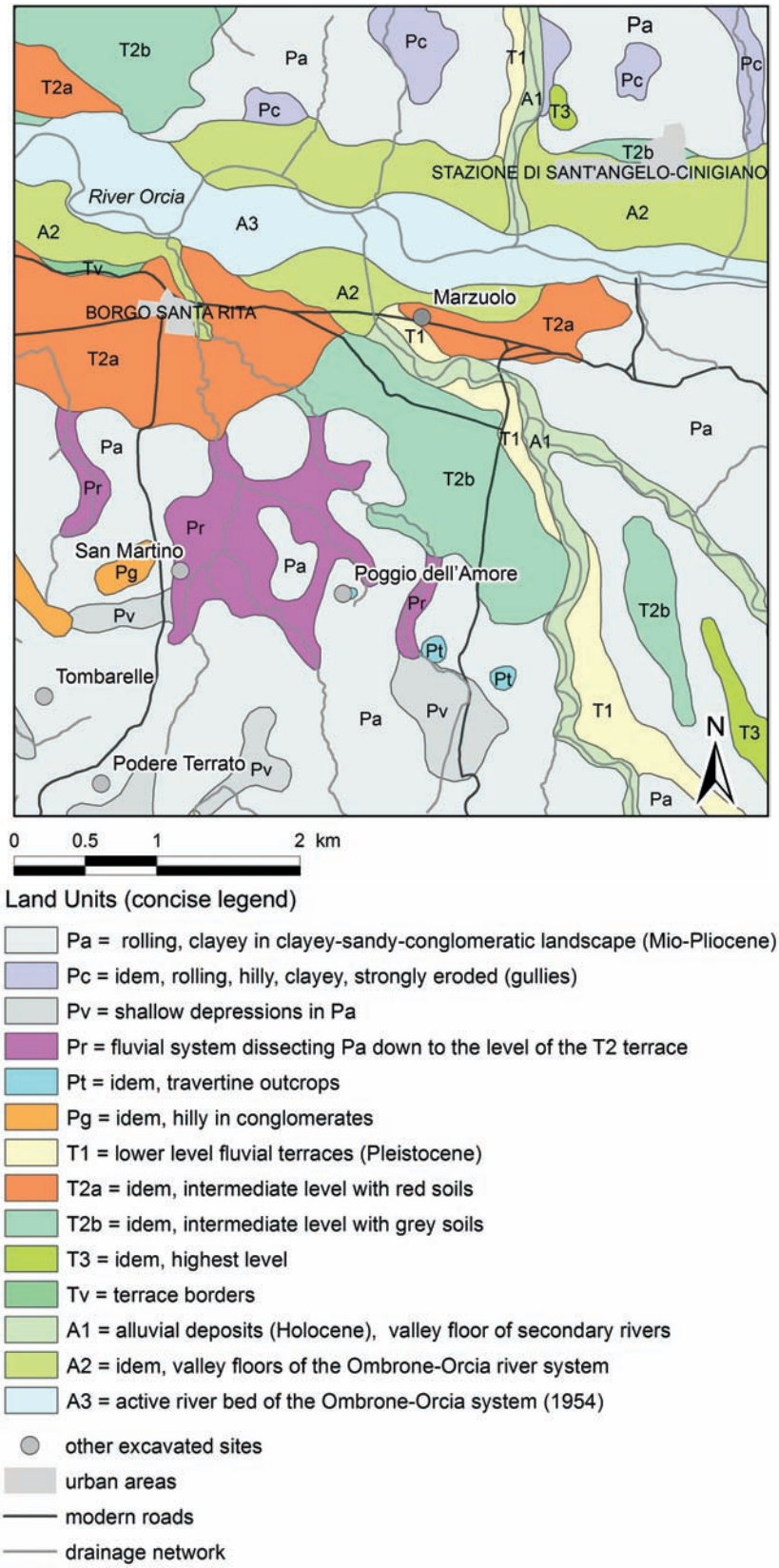


Fig. 10.60 Marzuolo locale, land units map (AA).

9

Podere Terrato

9.1 Situation (AA, MG)

The site at Podere Terrato lies in the rolling plains around Borgo Santa Rita in the northern part of the *comune* (Figs. 9.1 and 9.2), an area rich in Roman sites—Poggio dell'Amore lies some 2.2 km aerial distance to the NE and San Martino 1.5 km to the N. At Podere Terrato, the Mio-Pliocene clays to the N, the area where San Martino and Poggio dell'Amore are situated, meet bands of sand and pebbly conglomerates (see Fig. 9.13). The site of Tombarelle (Ch. 11), 800 m to the N, lies in the same zone.

The site is located on a mid-slope, sloping NW to SE, sheltered beneath a small hill to the NW.

9.2 Remote Sensing (MG)

Ghisleni's survey located here two surface scatters: a large one (TU 404) measuring some 50 x 40 m, rich in tiles and some Italic sigillata with densities 1–5 sherds/m^2, and a minor one (TU 405) measuring some 7 x 5 m to the W, which yielded only tiles (Ghisleni 2010) (Fig. 9.3). Topographic unit 404 was classified as a small *fattoria* or farm, a functional category thus far not excavated by the project, while the minor site was classed as a habitation. Only TU 404 was investigated further.

Magnetometry survey was carried out over TU 404 with a 50 x 50 m grid, revealing two areas of anomalies. The first in the SW part of the magnetometry grid included two perpendicular linear anomalies, suggesting a square or rectangular structure; the second, to the NE of the first, a single dipole. The values in all cases were very low, pointing against large quantities of tile, mortar, or other burned construction materials. Open area excavation took place in both areas (Areas I and II, respectively).

9.3 Excavation (KB)

Area I: As anticipated by the surface and magnetometry, excavation revealed a site considerably larger than San Martino or Poggio dell'Amore (Figs. 9.4 and 9.5). In Area I was revealed a complex of six walls, composed of unworked limestone blocks set directly in the natural clay and oriented with the slope of the hill, that is, NW/SE. The absence of stone in the plow soil and surrounds suggest that upper portions of these walls were made of pisé rather than stone. This complex of walls seems to have formed one enclosed room (Room 1) with doors in the E and W walls. To the W, the room opened into a second space (Room 2), which appeared to be open on the W and N, its NW corner supported by a square pier. Room 1's E door appeared to give onto an open area, as no other walls

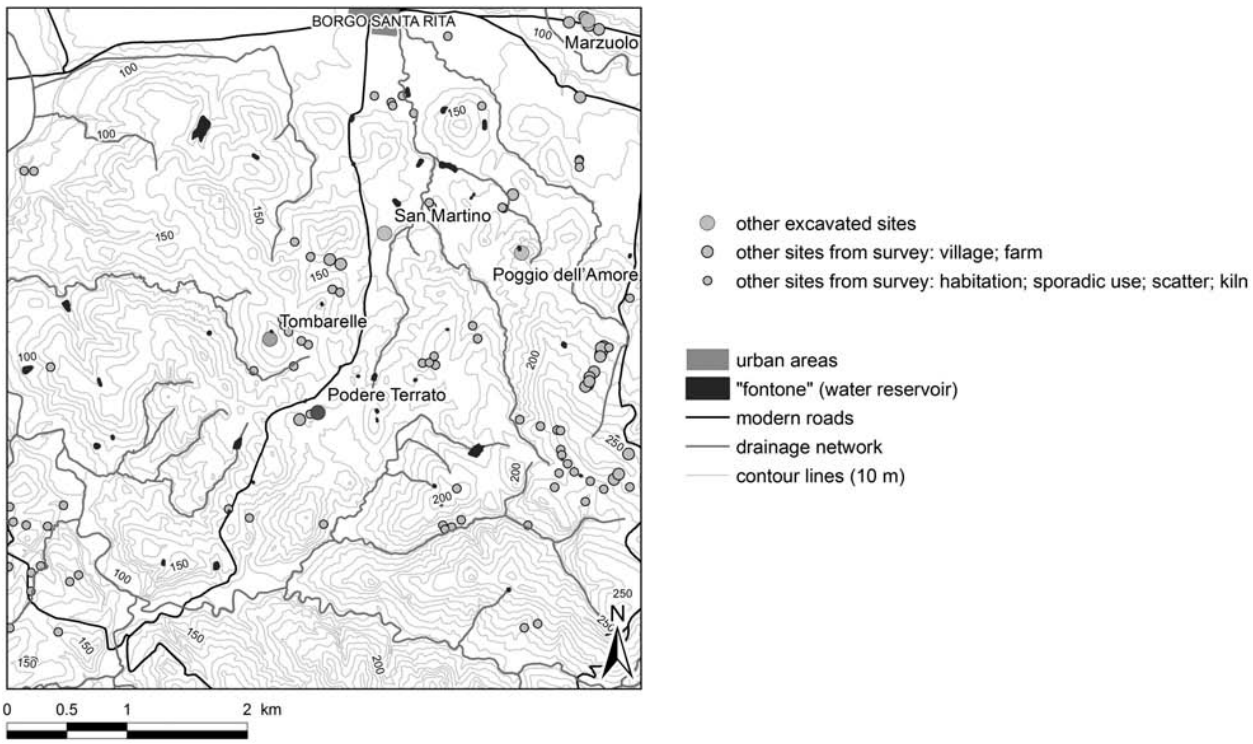


Fig. 9.1 Podere Terrato, general topography and Roman sites (AA).

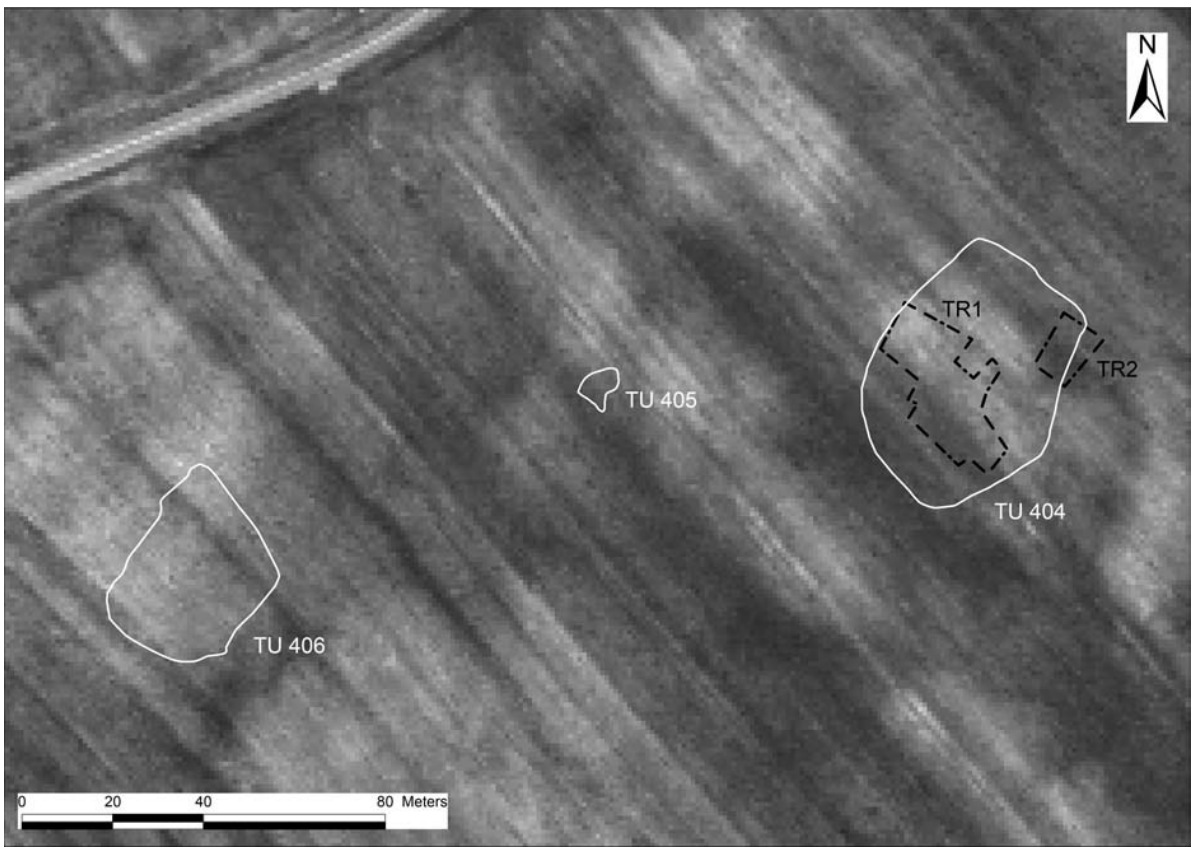


Fig. 9.2 Podere Terrato, surface scatters (ERZ/MS).

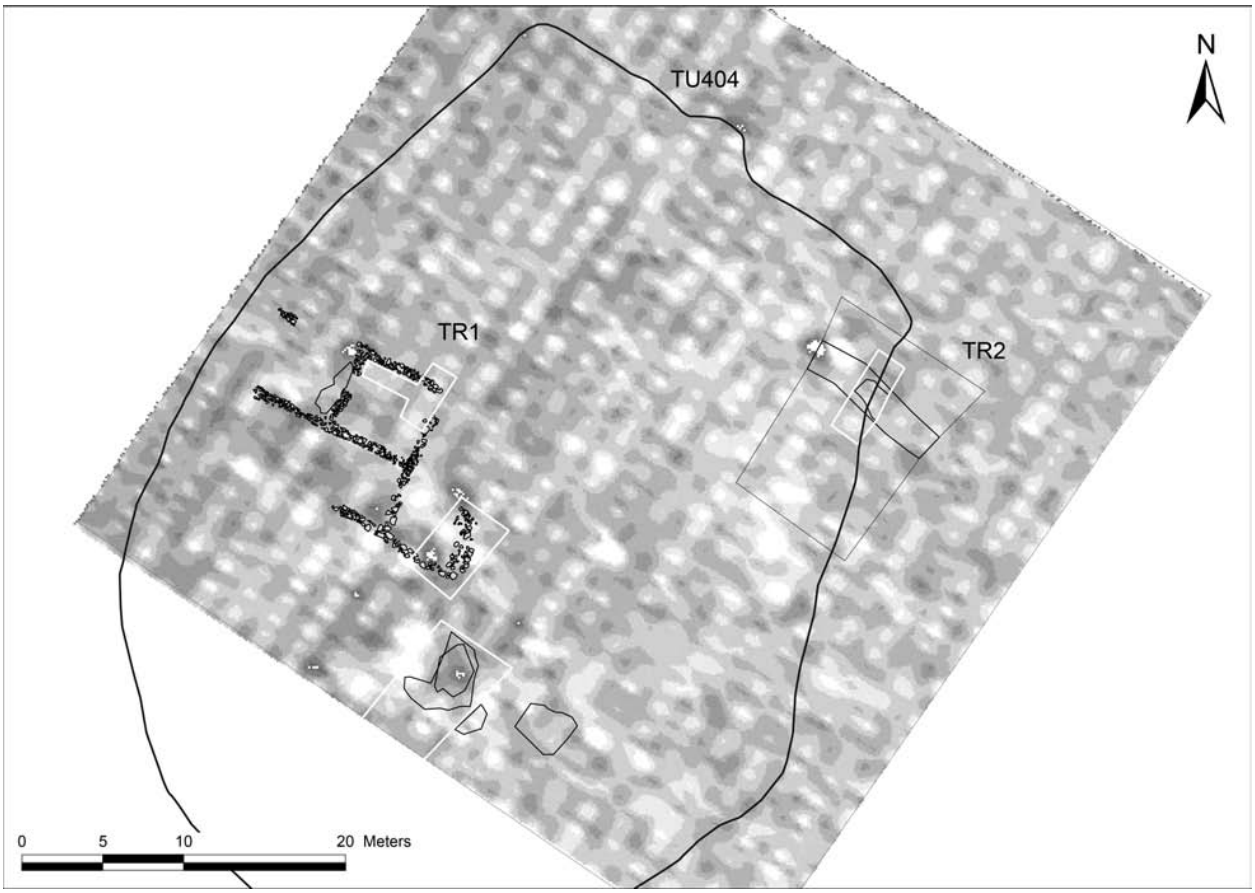


Fig. 9.3 Podere Terrato, remote sensing results for TU 404, overlaid with excavated remains (ERZ/MS).

or features were found here, although the trench was only opened about 2 m in this direction. Room 1's E wall (SU 8014), continued to the S, where it formed a corner with another long wall (SU 8013). To the E, this wall formed a corner with a badly damaged wall (SU 8023), whose N terminus was not found, while to the W, SU 8013 seems to have simply ended. The resultant areas were labeled Rooms 3 and 4, but in neither case did these rooms have four walls, Room 3 being open to the W and Room 4 being open to the N. All walls were bonded, with the possible exception of SU 8013/8023, suggesting a maximum of two construction phases.

We reconstructed the structures in Area I as a series of open sheds or terraces, organized around a single enclosed room (Room 1). To the W of Room 1 opened a porch (Room 2) whose pier indicates the presence of a roof, while to the S, the absence of a W wall in Room 3 suggests a shed or terrace, abutted against Room 1's S wall. The resultant structure composed of Rooms 1 and 2, measured 11.5 x 5 m. The E area, Room 4, is the least clear: while the fragmentary 8023 suggests a wall running N/S in this area, paralleling SU 8014, no walls were found joining SU 8014 that would indicate the closure of this area. Thus, we must reconstruct either a rectangular room running the whole length of 8014 but with a large doorway to the N (explaining the lack of join at the N corner of SU 8014/8019), or more likely, an L-shaped enclosure composed of the extant walls SU 8014, 8013, and 8023. Such an enclosure might be covered with a shed roof or left open.

No evidence of roofing was found in situ. However, the abundant presence of broken and abraded tile in the area to the SE (see below) and the presence of a robust roof pier (rather than posthole) for the porch roof on Room 2, suggest a tiled roof over Rooms 1 and 2 at a minimum.

Very few discernible features were found in these rooms. With the exception of two areas, natural

Fig. 9.4 Podere Terrato, view of excavated site from the W.

yellow clay was encountered immediately beneath the plow soil. This fact, and the poor preservation of the majority of materials in the lowest parts of the site suggest that the site was heavily abraded by erosion, probably starting in ancient times. The first exception was the SE corner of Room 2, extending into the doorway with Room 1, where a thin lens of charcoal (SU 8003) was found, accompanied by some fragments of Italic sigillata. The context was very thin and poorly defined but could represent the collapse of a wooden shelf or other wall installation placed in this corner. Alternatively, it could simply represent mixed materials washed from the upper portions of the site and captured by the wall corner.

The second exception was a substantial area of highly abraded tiles, often in large pieces, abraded ceramics with occasional animal bones, well packed with a sticky black matrix (8004), located in a roughly circular area to the S of SU 8013. The S edges of this context extended into the S trench wall. Excavation of this area revealed other packed surfaces, concentrically contained within and below SU 8004 (SU 8007, 8010, 8011, 8026) with matrices of varying (although still dark) color and texture (Fig. 9.6). Two interpretations of this area suggested themselves: because it lay somewhat lower than the rest of the site, it may represent an accumulation of erosion-born materials from the rest of the site. The lower contexts (SU 8011, 8026), however, seem too well packed to represent alluvial deposits. Alternatively, the area may represent an outdoor yard, in which a topographic low spot was repeatedly leveled and holes patched with whatever debris lay to hand. Against this notion is the absence of large quantities of animal bones and non-abraded ceramic in primary deposit, that is, domestic rubbish, which would be an obvious filler material so close to

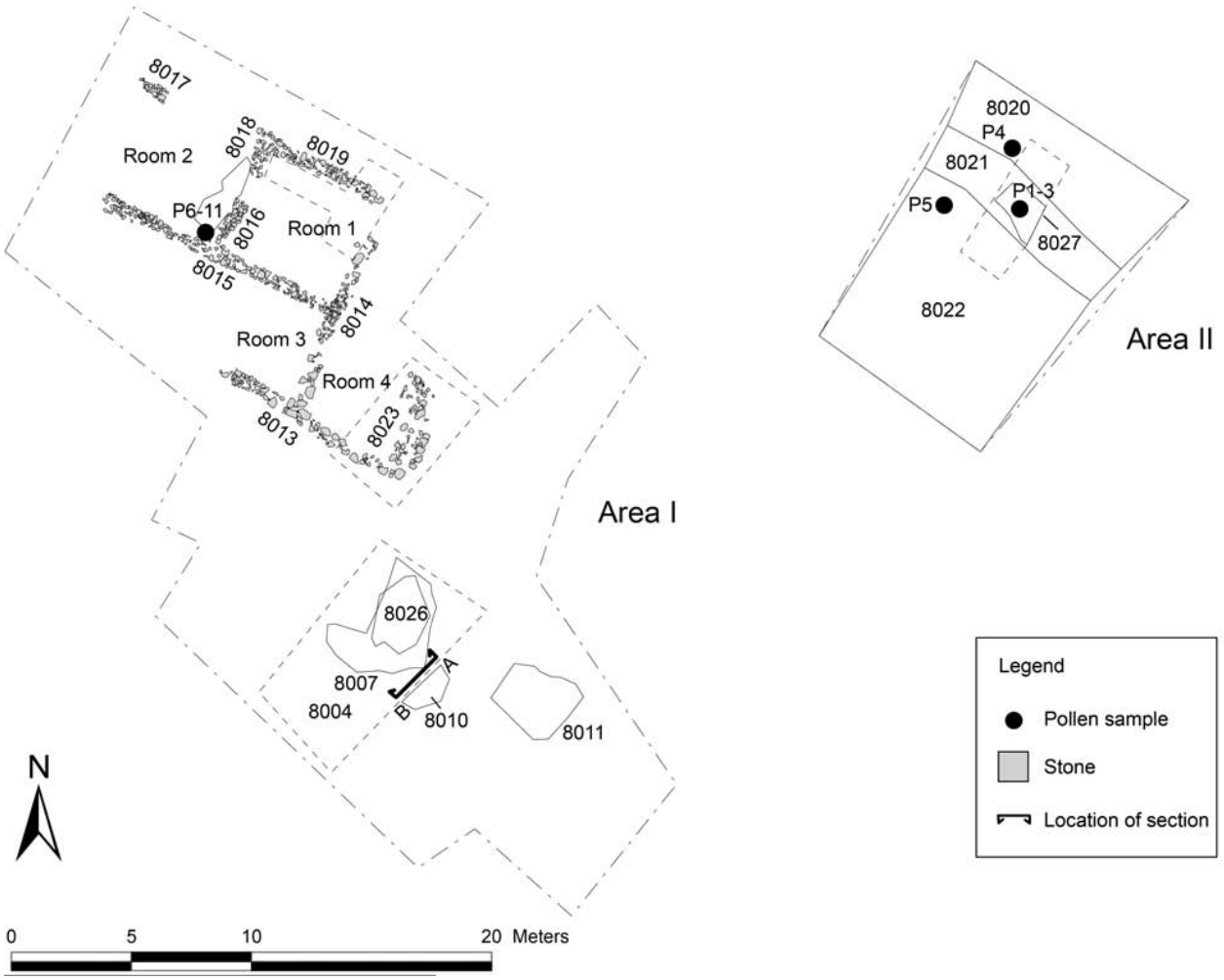


Fig. 9.5 Podere Terrato, overall site plan (ERZ/MS).

the main structure. On balance, we prefer the second hypothesis as it better explains the concentric (versus bedded) stratigraphy.

Area II: Located some 20 m to the NE of Area I, Area II was excavated to investigate the other magnetic anomaly. Here was found a NW/SE alignment of yellow, sandy loam (SU 8021), some 2 m across, running the entire length of the trench (8.8 m) and clearly delineated on either side by dark clay, very similar to that found in the NE areas of Area I. A section was excavated across this feature, revealing a fairly regular U-shaped cut (SU 8027), containing at its base a consistent level of small cobbles (SU 8028), filled by the yellow sand of SU 8021 (Fig. 9.7).

The regular shape of the cut and the consistent bedding of cobbles and tiles again led us to identify this as a man-made drain, whose orientation echoed that of the structures nearby. The sandy fill also indicates a drain, as sand is a coarser, heavier sediment than the surrounding clay and would preferentially accumulate where water energy existed to carry it. The distance of this drain from the excavated structures, and the absence of any geophysical anomalies that might suggest other structures in the unexcavated area between, further suggest this drain was not used to drain habitation areas. It was most likely an agricultural field drain of the type found at Colle Massari (Ch. 8) and that continue to be employed in this landscape.

9.4 Chronology (EV)

Four coins from the interface between the topsoil and the first archaeological strata (SU 8001) point to a

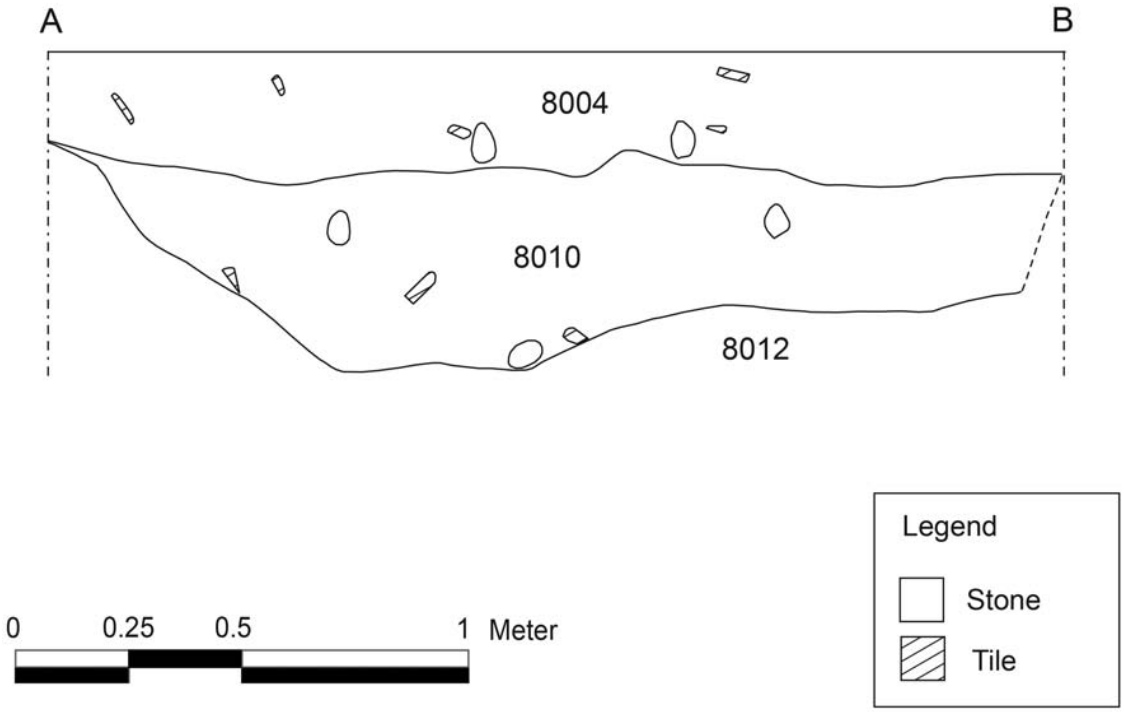


Fig. 9.6 Podere Terrato, S section, "yard" (ERZ/MS).

Fig. 9.7 Podere Terrato, view E section of drain SU 8021 after excavation.

general date for Podere Terrato to 9 BC–55 AD: an Augustan *quadrans* from 9 BC, an Augustan *as* from 7 BC, a *dupondius* of Gaius 37–41 AD, and a Claudian *dupondius* from 41–54 AD (see Small Finds/Coins below).

A quantity of more precisely datable ceramics plus a stratified coin suggest a similar, if somewhat tighter chronology. SU 8003 seems to relate to a living or abandonment surface and yielded three fragments of Conspectus cups and a dish dating to the first half of the 1st c. AD or slightly later, while another possible collapse context (SU 8002) yielded a Tiberian *as* from 23 AD. Despite the relative sequence offered by contexts excavated in the yard, the best datable context is SU 8026 as it contains a significant amount of Italic sigillata covering the time span between the Augustan period and the mid-1st c. AD and possibly slightly beyond. This date is also confirmed by the presence of one Campanian Dressel 2/4 and a Baetican amphora for fish-sauce.

Thus, like Poggio dell'Amore, the site may have originated in the Augustan period but saw its principal period of use in the first half of the 1st c. AD and possibly a bit beyond (Table 9.1).

9.5 Ceramics (EV)

Excavations at Podere Terrato yielded a larger quantity of Roman potsherds than the other sites of its general size group (i.e., San Martino, Poggio dell'Amore, Colle Massari), some 466 sherds (Tables 9.2 and 9.3). The incidence of diagnostics is quite high with 102 fragments (21.8%) accounting for a total of 62 MNI. Although erosion took a toll on the overall quantities and preservation of the site, the relatively better collected and preserved materials from the yard (SU 8004/8026) yielded sufficient data to point to a wide range of activities, particularly dining, but also including cooking and more minimally storage, as well as the episodic import of both regional and extra-regional products. The assemblage diversity was moderate with seven ceramic classes and 15 distinct forms.

Like most other sites of this period, the assemblages were dominated by tableware classes (74.74% of the total by MNI) as opposed to kitchen (17.74%) or amphora/storage (8.06%) classes. Compared to the contemporary site at Poggio dell'Amore the ceramic repertoire at Podere Terrato is larger with seven classes, containing thin wall dining wares and *vernice rossa interna* cooking wares.

Although its percentages by MNI of Italic sigillata (33.8%) are lower than the contemporary Poggio dell'Amore, it nonetheless received a significant quantity (Fig. 9.8) and, thus, took part in what appears to be the robust supply of fine wares to small, even tiny, rural sites in this region. Like Poggio dell'Amore it lacks larger drinking vessels such as chalices that were present at Case Nuove and at Marzuolo (where they were part of the 50–70 AD production). The Conspectus 21.3 dish and Conspectus 34 cup (Fig. 9.8.9

Table 9.1 Podere Terrato, major excavated contexts with diagnostic ceramics/dates (EV).

Context	Chronological Information: Pottery	Total MNI	Possible date	Reliability
8001	Cup Consp 34 (Thin Section Analysis CNG 19) *not* from Marzuolo; Cup Consp 26; Dish Consp. 11; Rouletted cup Consp. 32; Dish, Consp. 20; Dish. Consp. 3; Cup Consp. 22	12	Tiberian-Flavian	Poor – just below plow soil
8003	Dish Consp. 27; Cup, Consp. 27; Cup, Consp. 26; *tegame*, VRI	12	Tiberian-Neronian	Good
8005	Dish Consp 20.4 (Thin Section Analysis CNG 16, *not* from Marzuolo)	1	mid-1st c. AD	Good
8007	CW jug, double handled band shaped rim; handled closed form jugs	9	early imperial	Good
8010	KW pot; banded jug. Handled jug	5	early imperial	Good
8026	Amphora, Baetican fish sauce; cup Consp. 34?; dish Consp. 4.3–.4; Dish Consp. 3.1–.2; Dish Consp. 18.1; Dish Consp. 18.1/ Dish Consp. 20; CW handled closed forms; Amphora Campanian Dressel 2/4; CW closed and handled form jugs	18	Tiberian-Flavian	Good

and 1, respectively) subjected to thin section analysis did not prove a match with the Marzuolo fabrics (see Vaccaro, Capelli, and Ghisleni 2017 and Ch. 10).

Amphorae are more abundant, too, with 4 MNI at Podere Terrato compared to only 1 MNI at Poggio dell'Amore (Fig. 9.10.1–5). Two of the amphorae from Terrato should refer to small regional/local types, whereas two more specimens belong respectively to a Campanian Dressel 2/4 (wine) and a Baetican fish sauce amphora, attesting to both regional and longer-distance supply of wine and fish sauce.

Tablewares are characterized by a balance between open (35.47%) and closed (37.07%) forms, with somewhat fewer open forms than most sites of this period. Of closed forms, the most common is the coarse ware jug (16.12%) (e.g., Fig. 9.9.3, 5–8, 11–21), including a number of versions of a double handled type with a band-shaped rim, and a variety of generic closed ware forms (11.29%). Three MNI of thin walled beakers (Fig. 9.9, 1–2) were also part of this closed form group. Open forms, as is also typical of our sites, were dominated by dishes (19.35%) and cups (14.51%), mostly in Italic sigillata including dishes in Conspectus 3, Conspectus 20, and Conspectus 11, and cups in Conspectus 34, a carinated cup in Conspectus 26, and a rouletted cup in Conspectus 32 (see Fig. 9.8).

Cooking wares also showed a balance between closed and open shapes. Closed forms found: pots (6.45%) (Fig. 9.10.8–10), including some generic early Roman cooking pots and a "cordonata" form pot, and cooking jugs (1.61%) (9.10.11). Open forms included coarse ware casseroles (3.22%) and *tegami* (4.83%) in *vernice rossa interna* (Fig 9.10.7).

The tiles from this site were not studied.

Table 9.2 Podere Terrato, ceramic classes ceramic classes by MNI and % MNI (EV).

Ware	Podere Terrato (102 diagnostics/62 MNI)
BGW	0 or 0%
Italic sigillata	21 or 33.87%
Thin walls	3 or 4.83%
Experimental sigillata	0 or 0%
ARS	0 or 0%
Color-coated ware	0 or 0%
SCT	0 or 0%
Late Italic sigillata	0 or 0%
Coarse ware	22 or 35.48%
Kitchen ware	8 or 12.9%
Tunisian kitchen ware	0 or 0%
Amphorae	4 or 6.45%
Coarse ware/amphorae	1 or 1.61%
VRI	3 or 4.83%
Dolia	0 or 0%
Lamps	0 or 0%
Loomweights	0 or 0%
Amphora stopper	0 or 0%
Other ware (*tubuli*? and kiln spacers)	0 or 0%
Thin walls/coarse ware	0 or 0%
Color-coated ware/coarse ware	0 or 0%

Table 9.3 Podere Terrato, ceramic formal/functional classes by MNI and %MNI (EV).

FORMS	Podere Terrato (102 diagnostics/62 MNI)
KITCHEN (includes KW and VRI)	**11 or 17.74%**
Generic closed forms for kitchen	0
Cooking pots	4 or 6.45%
Cooking jugs	1 or 1.61%
Generic open forms for kitchen	0
Casseroles	2 or 3.22%
Cooking bowls	0
Frying pans/*tegami*	3 or 4.83%
Bread-baking pans/*testi*	0
Clibani	0
Cooking lids	1 or 1.61%
DINING/STORING (includes CW, FW and CCW)	**46 or 74.19**
Generic closed forms for table and storage	7 or 11.29%
Jugs	10 or 16.12%
Jars	1 or 1.61%
Jugs/jars	0
Beakers	3 or 4.83%
Small table pot	2 or 3.22%
Bottles	0
Flasks	0
Chalice	0
Flanged-Bowls	0
Generic opens forms for table	1 or 1.61%
Bowls	0
Cups	9 or 14.51%
Dishes	12 or 19.35%
Bowls/Dishes	0
Basins	1 or 1.61%
Lids	0
Small vessels for sauces or perfumes(?)	0
Uncertain (food processing?)	0
Mortaria	0
TRANSPORT and STORAGE	**5 or 8.06%**
Amphora stoppers	0
Amphorae	5 or 8.06%
Dolia	0
Table amph/jar	0

Table 9.3 cont'd Podere Terrato, ceramic formal/functional classes by MNI and %MNI (EV).

FORMS	Podere Terrato (102 diagnostics/62 MNI)
LIGHTING	**0**
Lamps	0
OTHER "FUNCTIONAL" CERAMICS	**0**
Loomweights	0
Drains	0
Unguentaria	0
Kiln spacers	0
Molds	0
Tubuli	0
RESIDUALS	**0**
UNCERTAIN	**0**

9.6 Faunal Materials (MM)

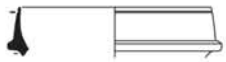
Recovered faunal materials from the site comprise two groups (Table 9.4). First is a relatively wide assortment of fossilized shells, many broken and fragmentary. Represented taxa include *Dentalium* sp., *Venus* sp., and *Turitella* sp. These shells were fairly ubiquitous across many deposits at the site, but rarely in quantities of more than a few within each deposit. Presumably they represent fossils associated with Pliocene sediments in the area, which, given the nature of erosion in this region, could readily have been incorporated into the various archaeological levels at the site.

The second category of faunal remains from the site includes 3 adult equid molar or premolar teeth (collectively weighing 94 g) and 12 small fragmentary long bone pieces that fit within the range of a medium-sized (cf. sheep/goat or pig) mammal (combined weigh 15 g). The long bone fragments are scattered across SU 8003, 8007, 8025, and 8026, with the bulk associated with the latter two contexts. Two of the three equid teeth (one maxillary, one mandibular) came from SU 8007. An exact taxonomic identification is not possible, but on the basis of the relatively small width of the maxillary tooth represented (22.3 mm) it (perhaps both) may derive from a donkey. The third equid tooth (a maxillary premolar/molar) derives from SU 2025; it may denote a horse or mule (its width measurement is 26.1 mm).

While the entire collection of faunal materials from the site is relatively small and mixed with fossilized and archaeological specimens, what unites the entire assemblage is a high degree of taphonomic uniformity. Materials show marked traces of sun-bleaching, surface exposure, exfoliation, and other signals consistent with heavy erosion. In this respect, a case may be made for a secondary depositional nature to all of these remains. Given the low

Fig. 9.8 (*facing*) Podere Terrato, Italic sigillata (IT SIG) from SU 8001, 8002, 8003, 8005, 8026: 1, 14. Cups Conspectus 34; 2, 12. Cups Conspectus 26; 3. Dish Conspectus 11; 4. Cup Conspectus 32; 5, 8, 10, 18. Dishes Conspectus 20; 6, 16. Dishes Conspectus 3; 7. Cup Conspectus 22; 9. Dish Conspectus 21; 11. Cup Conspectus 27; 13. Cup Conspectus 14; 15. Dish Conspectus 4; 17. Dish Conspectus 18; 19. Unidentified dish (?). (EV).

Italic sigillata (IT SIG)



1. Conspectus 34_US 8001

2. Conspectus 26_US 8001

4. Conspectus 32_US 8001

3. Conspectus 11_US 8001

5. Conspectus 20_US 8001

6. Conspectus 3_US 8001

7. Conspectus 22_US 8001

8. Conspectus 20.4_US 8005

9. Conspectus 21.3_US 8002

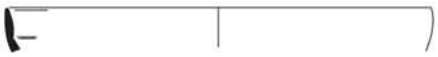
10. Conspectus 20.4_US 8003

11. Conspectus 27_US 8003

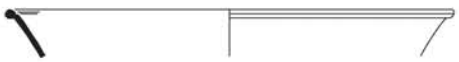
12. Conspectus 26_US 8003

13. Conspectus 14.2_US 8003

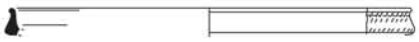
14. Conspectus 34 (?) with *planta pedis* stamp_US 8026



15. Conspectus 4.3/4.4_US 8026



16. Conspectus 3.1/3.2_US 8026



17. Conspectus 18.1_US 8026

18. Conspectus 20_US 8026

19. Non id_US 8026

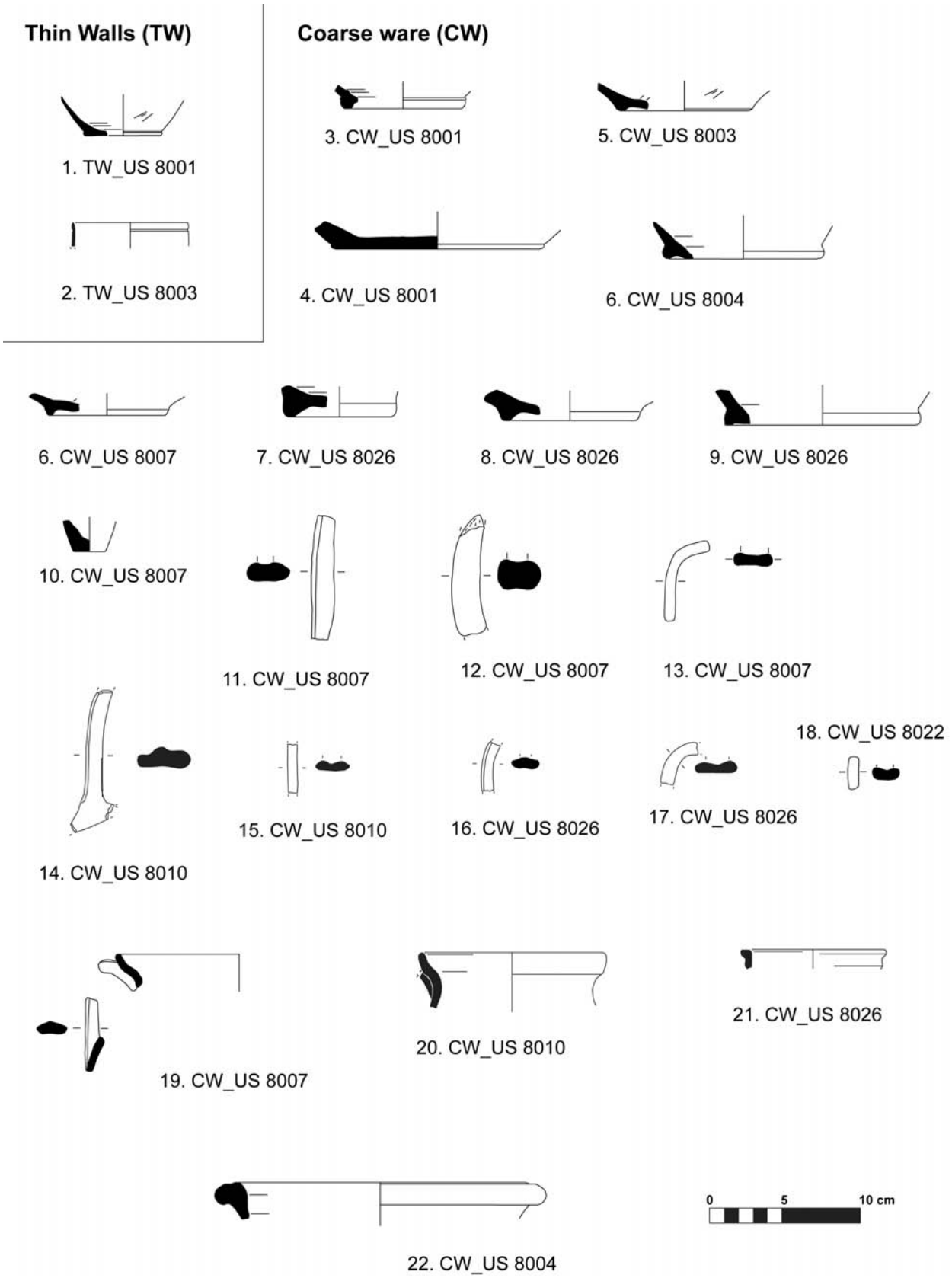


Fig. 9.9 Podere Terrato, Thin Wall ware (TW) and Coarse wares (CW) from SU 8001, 8003, 8004, 8005, 8007, 8010, 8022, 8026: 1–2. Thin Wall ware beakers; 3, 5–8, 11–21. Various sized jugs; 4, 9. Table jars; 10. Small table-pot; 22. Basin (EV).

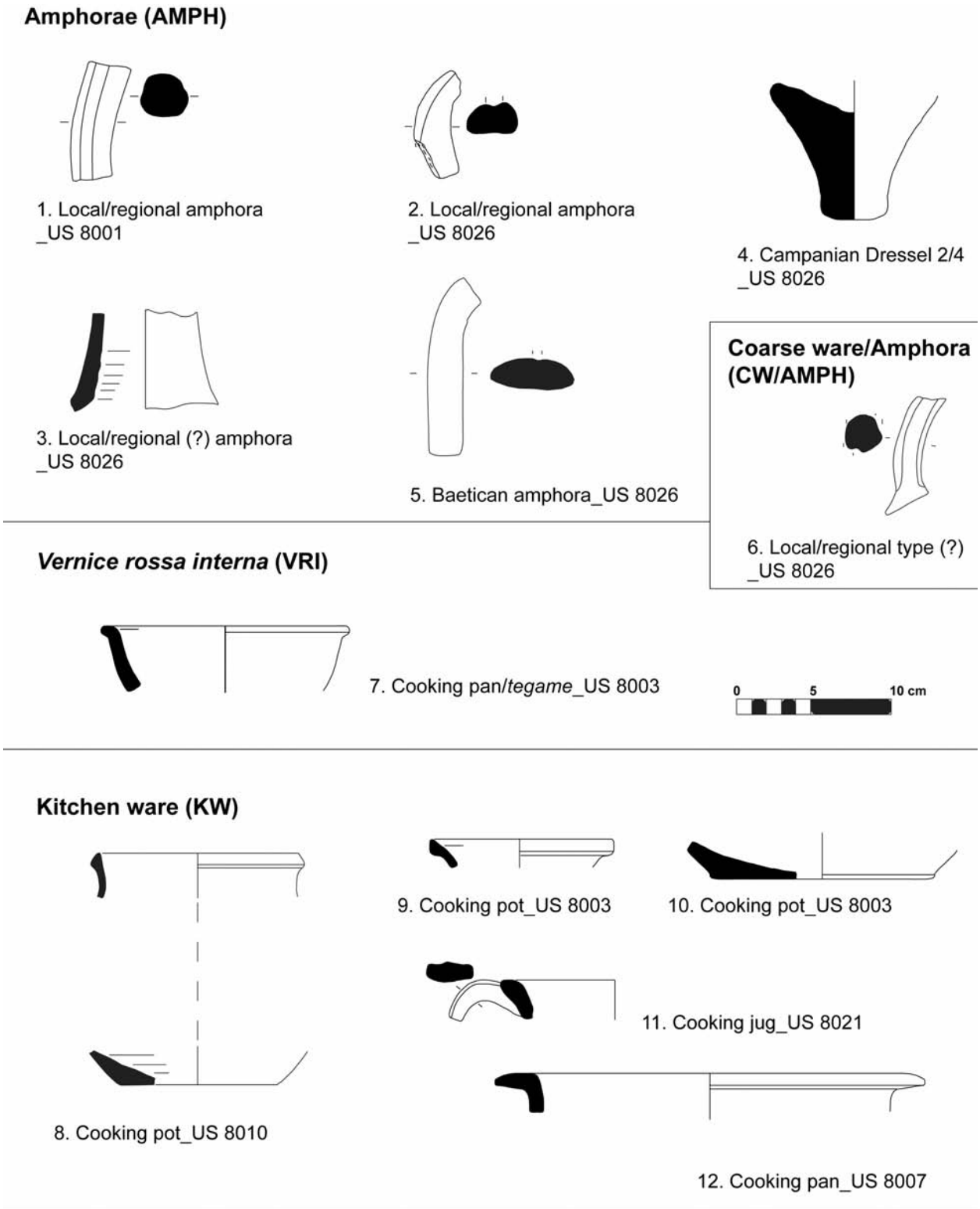


Fig. 9.10 Podere Terrato, Amphorae (AMPH), Coarse ware/Amphora (CW/AMPH), *Vernice rossa interna* (VRI) and Kitchen ware (KW) from SU 8001, 8003, 8007, 8010, 8021, 8026: 1–3. Local/regional amphorae; 4. Campanian Dressel 2/4; 5. Baetican fish-sauce amphora; 6. Local/regional Coarse ware/Amphora; 7. Cooking pan/*tegame* (VRI); 8–10. Cooking pots (KW); 11. Cooking jug (KW); 12. Cooking pan (KW) (EV).

Table 9.4 Podere Terrato, faunal remains (MM).

NISP total (cattle+sheep/goat+pig)	% cattle	% sheep/goat	% pig	NISP of other principal mammalian and avian taxa present
—	—	—	—	3 equid (tooth fragments), various fragments of geological, fossilized marine shells; 12 unid. long bone fragments

proportion of faunal remains that might otherwise be connected to food consumption and animal processing activities within the recovered assemblage, it can be argued that the site is relatively "clean" of faunal rubbish, an argument that is also proposed for other sites with a comparable dearth of zooarchaeological remains (e.g., Poggio Amore, San Martino) Nonetheless, finding three equid teeth, in a context where equid bones and teeth are relatively rare (if at all present) among most other sites in the region is significant, and may indicate a heightened presence of equids at the site. Such animals could variously fulfill work-related roles (pack animals, traction, transport) at the site, and presumably find shelter or housing (as required) among the various conjectured outdoor and indoor spaces (covered or otherwise).

9.7 Hydrological/Geological Contexts, Land Units, and Land Evaluation (AA)

As described above, the site sits at an intersection between the impermeable Mio-Pliocene clays to the S and more hilly sands/conglomerates to the N (Fig. 9.11).

The geology is ideal for natural upwellings as subsurface water is blocked by the impermeable clays and emerges at these clay/sand interfaces. The micro-undulations in the landscape (see Fig. 9.12) here are a product of this water-rich environment: on the land units map (see Color Fig. 9.13) this area is classified as unit Pv: depressions in the clay landscape with an undulating to rolling morphology. In the upslope area just W of the site two shallow morphological depressions are visible. All these undulations suggest a landscape rich in spots of water outflow. Furthermore, abrupt changes in slope around the site, from about 4% increasing towards the W to ca. 8%, would have caused this water to pool over the surrounding land. Indeed, the landscape shows several modern drainage channels, some running in the direction ca. NE-SW, while others, including a modern example that ran through the site itself, run ca. NW-SE—all moving generally in the direction of the Fosso della Vigna di Poggialto, a tributary of the Torrente Trisolla to the SE.

Thus, the ancient field drain (SU 8021) in Area II along the southern margin of the site seems to be the forerunner in a landscape which continues to be drained today (Fig. 9.12). The need for the drain relates both to the presence of water seepage and possibly to the change in topography from a steeper slope to the W to a more moderate one in the area of the drain. Water would have collected on these flatter slopes, requiring drainage.

The land units map (Color Fig. 9.13) shows clear dominance of clayey soils, alternating with large spots of conglomerates and fine sands, both as Pleistocene river terraces and Mio-Pliocene low hills. The latter increase towards the S and W. In detail, this texture variation is richer than shown on the land evaluation map of Figure 9.14, as illustrated by the detailed lithology of Figure 9.11. This variation, in combination with the frequent natural water outflows now often domesticated in the form of *fontoni*, gives the locale a good potential for the cultivation of crops and tree crops as well as for pasture. As was the case for San Martino and Poggio dell'Amore, the land suitability around the site declines somewhat if the heavy clayey soils are imagined to have been hard to plow (Fig. 9.15).

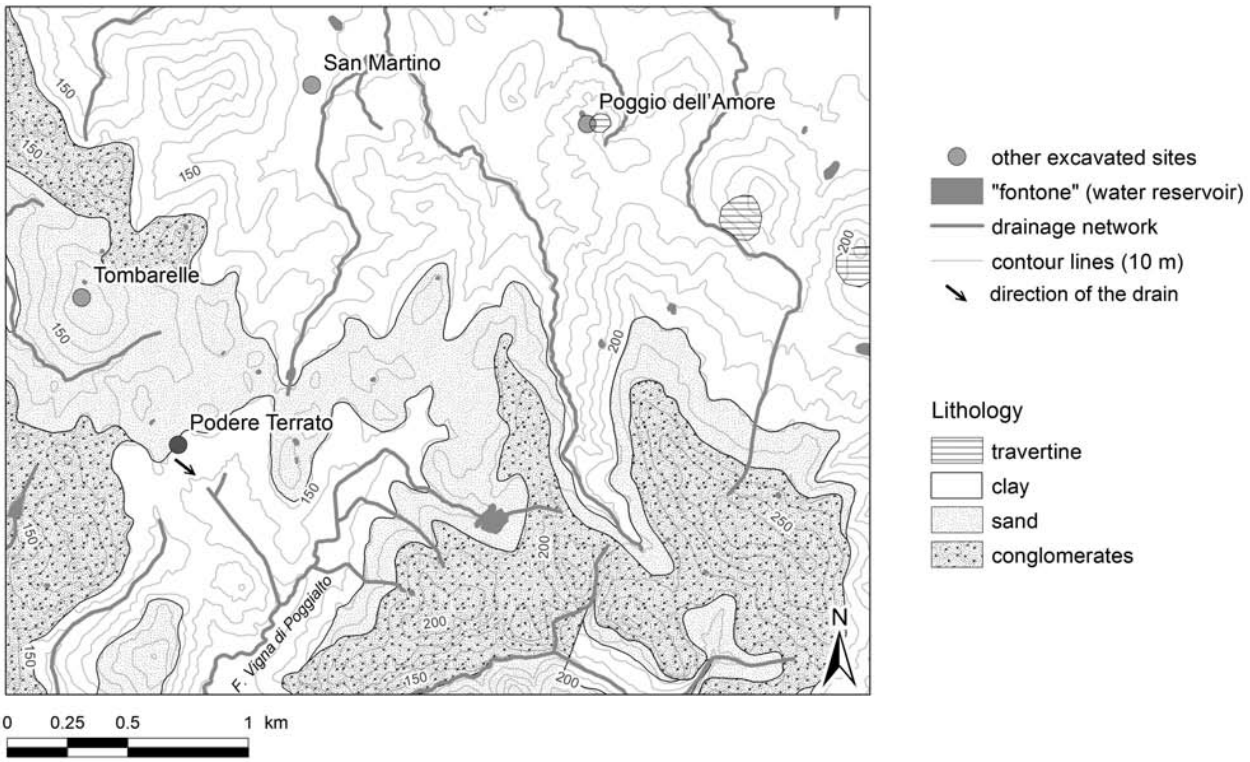


Fig. 9.11 Podere Terrato, map of locale showing geological and hydrological features (AA).

Fig. 9.12 Podere Terrato, view of landscape to W, showing undulations and modern drainage canals.

9.8 Botanical Materials (AAM, ER, RR)

A total of 17 archaeobotanical samples were collected and treated (Tables 9.5–9.7). Eleven pollen samples were taken from Areas I and II: Area I, inside the structure (six samples from three contexts: SU 8004, 8010, 8012), Area 2, out of the structure and inside the drain (five samples from four layers SU 8022, 8020, 8021, 8028) (see Fig. 9.5). Six macroremain samples were taken for flotation from six contexts: Area I, inside the structure (SU 8003) and outside (SU 8026) the structure; Area II, out of the structure and inside the channel (four sample from four contexts [SU 8022, 8020, 8021, 8028]).

A total of 6,010 pollen grains (ca. 550 p/sample on average), 1,169 NPPs, 74 microcharcoals, and 280 seeds/fruits were counted (Table 9.5). Pollen was found in all samples and the concentrations are high (16,567 p/g on average), and no differences were observed between samples taken inside the structure and those taken in the channel. The state of preservation of pollen was generally poor, but some differences were observed in grains from the two areas. Besides well-preserved grains, pollen from the structure (Area I) was sometimes crumpled, distorted, and dark. Pollen from the channel (Area II) was clear, due to thin, sometimes transparent, exines: this may be a result of hydration-dehydration phases. The secondary or reworked pollen (i.e., pollen which are included in rocks, and then eroded by river flows) are present in all samples and are more abundant in the channel—again indicating significant erosion action at the site. Also pollen clumps, of one or more mixed types, are more abundant in

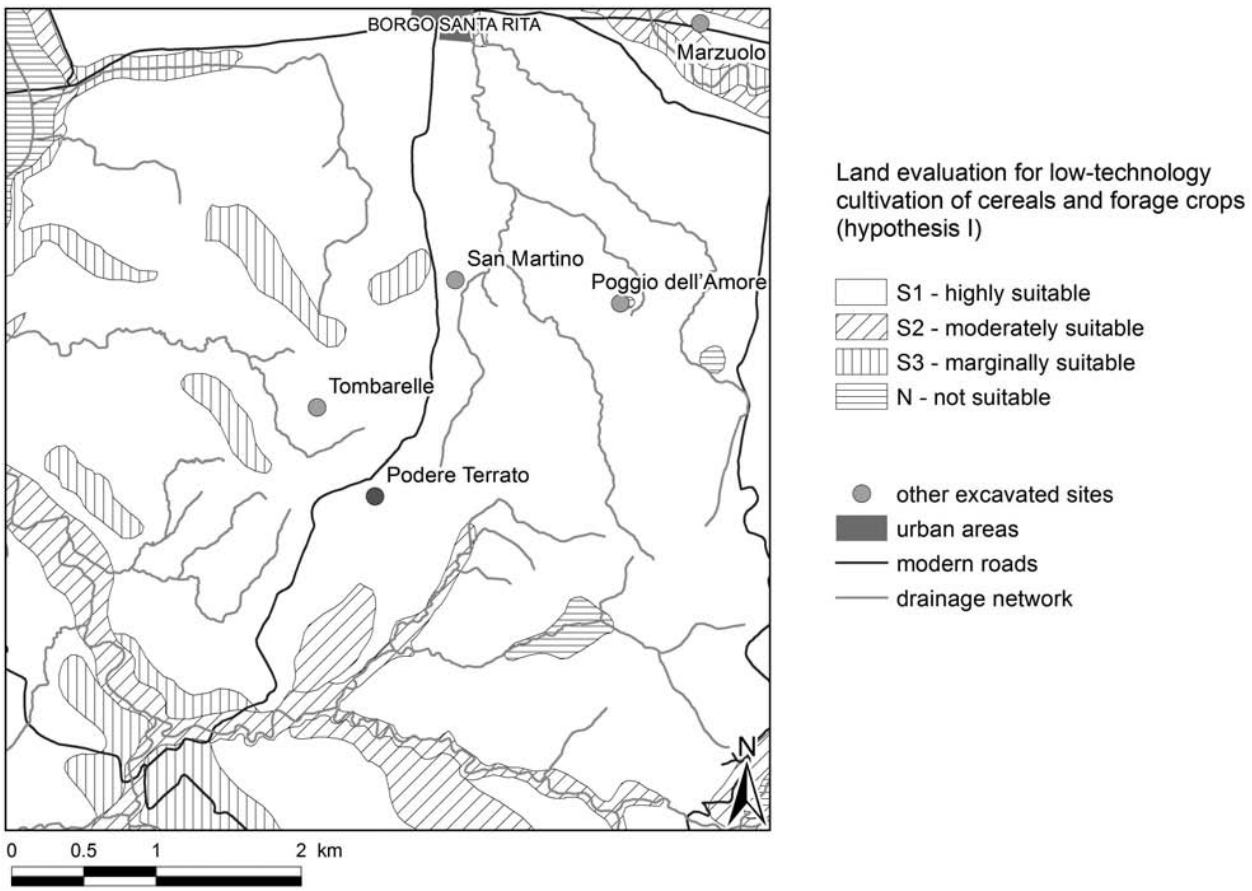


Fig. 9.14 Podere Terrato, land evaluation map, hypothesis I (AA).

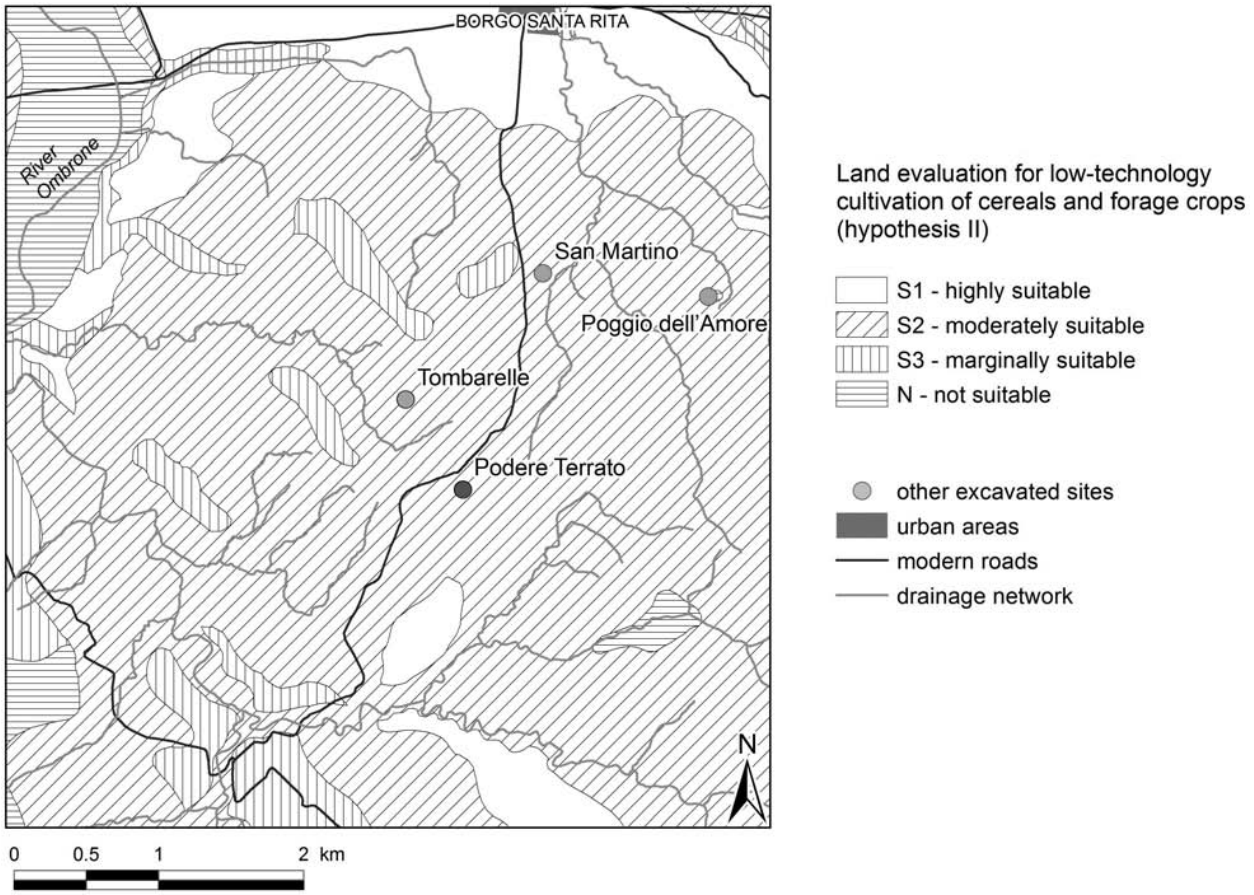


Fig. 9.15 Podere Terrato, land evaluation map, hypothesis II (ERZ).

the channel, particularly groups of Cichorieae, Apiaceae, and *Quercus*. Immature pollen grains of one single type are sometimes grouped as they are in anthers.

Landscape and Woodland Composition: Pollen diversity was relatively high, ranging from 39 to 51 per sample with a total of 96 taxa identified. Trees, shrubs, and lianas are represented by 25 taxa, about one third of those are herb plants (63 taxa). The number of taxa in the samples ranged from a minimum of 39 (samples P6, P7) to a maximum of 51 taxa (P1). Arboreal/Non Arboreal pollen ratios (AP/NAP) were low, 17/83 on average. Woodland percentages represent different types of woodlands: conifer woods, oakwoods, possibly mixed conifer and broadleaf woods, Mediterranean woods, hygrophilous woods. Trees were somewhat more common in the vicinity of the channel (sample P4 shows the maximum AP of 27%), where the plants probably found a good water supply. Conifers (6%) include *Pinus* and *Abies*, while the mixed oakwoods (6.1% on average) are represented by deciduous *Quercus* associated with *Carpinus betulus*, *Corylus*, and *Ostrya*.

Several trees of economic interest or with edible fruits are present in traces. *Corylus* and *Vitis* are present in the two areas: the hazelnut tree was present in almost all samples of the channel (except P5) and in one sample of the structure (P9), with 0.2% on average; grape was present in the samples P1, 7, 9, and 11, with 0.1% on average. *Rubus* type was present only in Area I (P10). A number of woody plants are represented in Area II, the channel: *Olea* and *Cornus mas* were found, each with 0.1% on average; *Myrtus* was present only in PT11/1, and *Prunus* only in P2.

Wet Environments: Wet environments and freshwater habitats were well represented (5.4% on average): trees (*Alnus, Salix*), helophytes (Cyperaceae,

Table 9.5 Podere Terrato, pollen analysis (AMM/ER).

PODERE TERRATO Percentage pollen spectra														
Sample (PT)			***P1***	***P2***	***P3***	***P4***	***P5***	***P6***	***P7***	***P8***	***P9***	***P10***	***P11***	***Mean pollen spectrum***
Area			Drain					Structure/Yard						
Stratigraphic Unit			8028	8021		8020	8022	8012	8010	8004	8012	8010	8004	
Depth - cm			55	42	34	20	20	44	30	13	60	39	14	
Pollen concentration (p/g)			**18762**	**7775**	**8604**	**14409**	**36844**	**8746**	**25968**	**26269**	**11538**	**14726**	**8599**	**16567**
BETULACEAE	*Alnus*	Wt	0.3	1.7	2.0	3.0	1.9	0.9	1.2	1.3	2.7	1.5	0.6	1.6
	Carpinus betulus	Ow	0.3				0.2	0.2	0.2	0.2	0.2	0.6		0.2
	Corylus	Ow	0.2	0.9	0.2	0.4					0.4			0.2
	Ostrya/Carpinus orientalis	Ow	0.6	0.2	0.4	0.2	0.2	0.2	0.2	0.6	0.9	1.5	2.2	0.6
CANNABACEAE	*Celtis*						0.3	0.2						0.05
CISTACEAE	*Helianthemum*		0.2		0.7	0.8		0.5		0.2	1.1	0.4	1.0	0.4
	Cistus			0.2		0.9	0.2				0.4	0.4		0.2
CORNACEAE	*Cornus mas*		0.2	0.8		0.4								0.1
EPHEDRACEAE	*Ephedra fragilis* type			0.2										0.02
ERICACEAE	*Erica arborea* cf.	Md		0.6	1.3	0.6	0.3	0.5	0.2		0.4	1.1	0.8	0.5
FAGACEAE	*Fagus*		0.2								0.2		1.0	0.1
	Quercus deciduous	Ow	6.7	3.2	4.1	10.6	5.2	6.0	3.3	3.0	4.7	3.4	2.8	4.8
	Quercus ilex type	Md	0.3		0.2				0.2					0.1
MYRTACEAE	*Myrtus*	Md	0.4											0.04
OLEACEAE	*Fraxinus* cf. *angustifolia*	Ow	0.2	0.9	0.9	0.2				0.2		0.2	0.8	0.3
	Olea europaea	Md		0.2	0.4									0.1
	Syringa cf.												0.2	0.02
PINACEAE	*Abies*			0.2	1.1	0.9			0.2		0.2	0.4		0.3
	Pinus		4.0	6.1	7.2	9.3	5.6	7.2	6.2	6.0	5.0	6.1	3.6	6.0
RHAMNACEAE	*Rhamnus*					0.2	0.2							0.03
ROSACEAE	*Prunus*			0.2										0.02
	Rubus type											0.2		0.02
	Rosa		0.3	0.4		0.4		0.7	1.0	1.3	0.5	1.0	1.0	0.6
SALICACEAE	*Salix*	Wt	1.0	0.6	2.0	0.2		0.7	0.2	0.2	0.7	1.5		0.6
TILIACEAE	*Tilia*	Ow					0.2							0.02
VITACEAE	*Vitis*		0.2						0.2		0.2		0.4	0.1
ALISMATACEAE	*Sagittaria*	Wh	0.2	0.8		1.5	0.3	0.2		0.2	0.4	1.5		0.5
AMARANTHACEAE	*Chenopodium*		1.6	3.2	1.5	0.2		0.2	2.1	3.0	0.9	0.8	2.4	1.4
APIACEAE	Apiaceae indiff.		2.4	1.7	1.3	0.2	0.5	0.7	1.2	1.9	0.9	0.6	1.6	1.2
	Peucedanum					0.9								0.1
ARACEAE	*Lemna*	Wh					0.2	1.0		0.8	0.7		1.0	0.3
ASTERACEAE	*Artemisia*		0.5	0.8	0.2	0.2	0.2	0.2		0.4	0.4	0.2	2.2	0.5
	Aster type	LPPl	4.6	4.9	5.9	5.7	6.3	9.5	4.6	1.7	6.6	5.7	4.2	5.4
	Cardus	LPPl			1.3					0.2	0.4		0.2	0.2
	Centaurea nigra type	LPPl	5.3	4.6	4.8	3.0	3.1	8.6	5.0	4.9	8.9	3.8	6.6	5.3
	Cichorieae	LPPl	35.7	23.9	23.8	28.2	36.5	31.1	38.1	38.1	29.7	27.4	35.0	31.6
BORAGINACEAE	*Echium*						0.2			0.4				0.1
BRASSICACEAE	*Brassica type*		1.6	0.8	1.5	1.1	1.0	1.0	1.2	0.4	0.9	2.7	1.2	1.2

Table 9.5 cont'd Podere Terrato, pollen analysis (AMM/ER).

PODERE TERRATO Percentage pollen spectra														
Sample (PT)			***P1***	***P2***	***P3***	***P4***	***P5***	***P6***	***P7***	***P8***	***P9***	***P10***	***P11***	***Mean pollen spectrum***
Area			Drain					Structure/Yard						
Stratigraphic Unit			8028	8021		8020	8022	8012	8010	8004	8012	8010	8004	
Depth - cm			55	42	34	20	20	44	30	13	60	39	14	
Pollen concentration (p/g)			**18762**	**7775**	**8604**	**14409**	**36844**	**8746**	**25968**	**26269**	**11538**	**14726**	**8599**	**16567**
	Brassicaceae indiff.		0.6	0.6	0.2	0.6	1.6	0.5	1.5		1.1	0.4	0.8	0.7
CAMPANULACEAE	Campanula												0.2	0.02
CANNABACEAE	*Cannabis*											0.2		0.02
CARYOPHYLLACEAE	Caryophyllaceae indiff.		1.0	1.5	2.0	1.7	0.3	4.0	1.0	1.5	1.6	3.6	1.4	1.8
	Paronychia		1.0											0.1
	Silene										0.2			0.02
CONVULVULACEAE	*Convolvulus*		0.2		0.2	0.2			0.4	0.2		0.2	1.2	0.2
	Cuscuta europaea		0.3	0.2	1.5		0.3	0.2	0.6					0.3
CRASSULACEAE	*Sedum*			0.6										0.1
CYPERACEAE	Cyperaceae	(Wh)	0.3	0.9	2.0	1.7	0.7	0.7	0.8	0.8	2.3	1.7	1.8	1.3
	Scirpus	(Wh)					0.2							0.0
DIPSACACEAE	Dipsacaceae indiff.				0.9	0.2							0.2	0.1
	Knautia arvensis			0.2										0.02
EUPHORBIACEAE	Euphorbiaceae			0.2	0.7		0.3						0.6	0.2
FABACEAE	*Astragalus*	le			1.3							0.2		0.1
	Dorycnium	le	0.6	0.4	0.7	0.8	0.2	1.0	0.4	0.4	0.4	0.6		0.5
	Fabaceae indiff.	le	0.8	1.7	0.7	1.3	2.3	0.9	0.8	0.2	1.6	0.4		1.0
	Lotus	le	0.5	0.8						0.2		0.2		0.1
	Medicago	le		0.8			0.2	0.2		1.3	0.5		1.6	0.4
	Trifolium	le	0.8	0.2	0.4	0.9	1.0		0.4		0.5	0.8	0.8	0.5
GERANIACEAE	*Geranium*				0.6	0.2					0.4	0.2		0.1
HYDROCHARITACEAE	*Hydrocharis*	Wh										0.2		0.02
LAMIACEAE	Lamiaceae indiff.		2.7	4.0	2.0	0.9	3.0	2.7	1.4	0.9	2.0	4.6	2.0	2.4
	Mentha type		0.5	0.2		0.2	0.3		0.4	0.4		0.2		0.2
	Salvia									0.2				0.02
LILIACEAE	Liliaceae indiff.						0.2							0.02
MALVACEAE	*Malva*				0.2									0.02
NYMPHAEACEAE	*Nymphaea alba* type	Wh	0.5	0.4	0.2	0.9	0.5				0.9	1.5		0.4
PLANTAGINACEAE	*Plantago*		2.1	0.6	0.6	0.8	1.2	2.4	1.0	1.9	1.3	1.3	0.6	1.2
POACEAE	*Avena/Triticum* group	ce	0.3		1.1	0.4	0.7	0.3	0.2	0.2	0.5		0.2	0.4
	Hordeum group	ce			2.0	2.3	0.5	1.0	1.5	1.5	0.7	1.3	1.0	1.1
	Secale	ce			0.2	0.6	0.3							0.1
	Cerealia indiff.	ce	0.6	2.3	0.9	2.5	1.7	1.2	3.7	1.9	0.9	1.9	1.8	1.8
	Phragmites australis cf.	Wh	0.2	0.9	1.7	0.6		0.2	0.6	0.2	0.4		1.0	0.5
	Poaceae-wild group		10.7	11.8	12.5	7.8	9.7	7.4	9.7	13.2	10.9	10.1	5.0	9.9
POLYGONACEAE	*Persicaria maculosa* cf.						0.2	0.5					0.2	0.1
	Rumex												1.0	0.1
PONTEDERIACEAE	*Pontederia* cf.		0.2											0.01

Table 9.5 cont'd Podere Terrato, pollen analysis (AMM/ER).

PODERE TERRATO Percentage pollen spectra													
Sample (PT)			***P1***	***P2***	***P3***	***P4***	***P5***	***P6***	***P7***	***P8***	***P9***	***P10***	***P11***	***Mean pollen spectrum***
Area			Drain					Structure/Yard						
Stratigraphic Unit			8028	8021		8020	8022	8012	8010	8004	8012	8010	8004	
Depth - cm			55	42	34	20	20	44	30	13	60	39	14	
Pollen concentration (p/g)			**18762**	**7775**	**8604**	**14409**	**36844**	**8746**	**25968**	**26269**	**11538**	**14726**	**8599**	**16567**
RANUNCULACEAE	*Ranunculus* type	LPPI	1.1	5.3	2.6	1.5	3.3	2.7	1.4	3.0	1.3	0.8	0.2	2.1
ROSACEAE	*Filipendula*												0.6	0.1
	Potentilla type	LPPI									0.2			0.02
RUTACEAE	*Ruta* cf.				0.2									0.02
SAXIFRAGACEAE	*Saxifraga* cf.					0.2	0.9		0.2	0.2	0.9	1.7	0.8	0.4
SCROPHULARIACEAE	Scrophulariaceae		1.0	1.1	0.6	0.4	2.8						0.6	0.6
	Linaria												0.8	0.1
SOLANACEAE	*Solanum nigrum* type		1.6					0.3		0.2	1.1	1.0		0.4
TYPHACEAE	*Typha latifolia* type	Wh		0.2				0.3				0.8		0.1
URTICACEAE	*Urtica dioica* type		0.2	0.6	0.2		0.3			0.2			0.2	0.1
	Urtica cf. *pilulifera*		0.5	1.3	0.6		0.5		1.7	0.4		1.0	1.0	0.6
VALERIANACEAE	*Valerianella*				0.2									0.02
Unknown/Indet.			5.1	6.5	2.0	4.5	4.2	4.0	7.4	6.2	3.4	4.4	6.0	4.9
POLLEN SUM			**625**	**527**	**538**	**528**	**576**	**582**	**517**	**530**	**559**	**525**	**503**	**546**
NUMBER OF TAXA			**51**	**49**	**50**	**45**	**47**	**39**	**39**	**43**	**47**	**47**	**47**	
SUMS														
Arboreal pollen		AP	**15.0**	**16.3**	**20.6**	**28.0**	**14.2**	**17.0**	**13.0**	**13.0**	**17.4**	**18.3**	**14.3**	**17.0**
Non Arboreal pollen		NAP	**85.1**	**83.7**	**79.4**	**72.2**	**85.8**	**83.0**	**87.1**	**87.0**	**82.6**	**81.7**	**85.7**	**83.0**
Mixed oak wood		Ow	**8.0**	**5.3**	**5.6**	**11.4**	**5.7**	**6.4**	**3.7**	**4.0**	**6.1**	**5.7**	**5.8**	**6.1**
Mediterranean trees/shrubs		Md	**0.7**	**0.8**	**1.9**	**0.6**	**0.3**	**0.5**	**0.4**		**0.4**	**1.1**	**0.8**	**0.7**
Wet environments (trees)		Wt	1.3	2.3	4.1	3.2	1.9	1.5	1.4	1.5	3.4	3.0	0.6	2.2
Wet environments (herbs)		Wh	0.8	2.3	1.9	3.0	1.0	1.7	0.6	1.1	2.3	4.0	2.0	1.9
Wet environments (Cyperaceae)		(Wh)	0.3	0.9	2.0	1.7	0.9	0.7	0.8	0.8	2.3	1.7	1.8	1.3
Wet environments		WE	**2.4**	**5.5**	**8.0**	**7.9**	**3.8**	**4.0**	**2.7**	**3.4**	**8.1**	**8.8**	**4.4**	**5.4**
Cerealia		ce	**1.0**	**2.3**	**4.3**	**5.7**	**3.3**	**2.6**	**5.4**	**3.6**	**2.1**	**3.2**	**3.0**	**3.3**
Legumes/pulses (-fodder)		le	**2.7**	**3.8**	**3.2**	**3.0**	**3.6**	**2.1**	**1.5**	**2.1**	**3.0**	**2.1**	**2.4**	**2.7**
LPPI (-Cich)			11.0	14.8	14.7	10.2	12.7	20.8	11.0	9.8	17.4	10.3	11.1	13.1
LPPI		LPPI	**46.7**	**38.7**	**38.5**	**38.4**	**49.1**	**51.9**	**49.1**	**47.9**	**47.0**	**37.7**	**46.1**	**44.7**

Scirpus lacustris, *Hydrocharis*, *Phragmites australis* cf., *Typha latifolia* type), and hydrophytes, water-floating plants (*Lemna*, *Nymphaea*, *Sagittaria*).

Cereal Fields: Pollen of cereals was somewhat higher than the nearby Poggio dell'Amore and San Martino (3.3% on average) to support the hypothesis that cereal fields were grown in the vicinity of the Podere Terrato. Different cereals were cultivated, represented in the spectra by *Hordeum* group, *Avena-Triticum* group and *Secale*, while Cerealia undiff. include the folded crumpled grains that cannot be distinguished and ascribed to the previous groups.

Cultivated Woody Plants: *Olea* pollen was found in the channel (only in two samples from SU 8021) suggesting that the tree was not cultivated in any large quantities near the site. *Vitis* was found as pollen, in one sample of the channel, three samples from the structure, and as fragments of seeds. Therefore, its presence near the site may be reasonably supposed. The other woody plants mentioned above as fruit-bearing plants are especially diversified in this site: hazelnut (*Corylus*), cornelian cherry (*Cornus mas*), and sloe species (*Prunus*) lived probably scattered around the site. They were possibly collected on the wild as the raspberry/blackberry (*Rubus* type), living just at the border of the fields, or also cultivated as individual plants in small orchards/gardens near the site.

Pastures and Fodder: As with the other sites, pasture indicators are strong (LPPI = 44.7%) and consistent in their taxa. Besides Cichorieae, that cover one third of the spectra (31.6% on average) and are key pasture indicators, pasturelands are indicated also by Asteroideae (*Artemisia*, *Aster* type, *Carduus*, *Centaurea nigra* type), *Ranunculus* type, and *Potentilla* type. Moreover, legumes such as *Trifolium*, *Medicago* and *Dorycnium*, *Lotus*, Fabaceae undiff., *Astragalus*, which were 3% on average, together with Poaceae-wild group (9.9% on average), include species that may have been cultivated for fodder. Other herbs common in pastures or in abandoned fields were Apiaceae undiff., *Brassica* type and Brassicaceae undiff., Caryophyllaceae undiff., and *Chenopodium*. The landscape around the site was probably used as a grass pasture, alternating with fields of cereals.

Garden Plants: Some taxa are particularly interesting as they can be both wild plants/weeds or cultivated useful plants, possibly grown in a kitchen garden. Some flowers are represented by pollen of *Syringa* type (lilac), *Campanula*, and *Geranium* (bellflowers and geranium, also found as seeds); they comprise 3% of the spectrum. Moreover, herbs such as *Peucedanum palustre* (milk parsley), Apiaceae undiff., *Echium*, *Sedum*, *Malva*, *Mentha* type, *Salvia*, *Ruta* cf., and *Valerianella* could be cultivated for food. Finally, the site also had relatively higher pollen presence of *Brassicaceae* (1.2%) than other sites: Brassicaceae, which include cabbage, broccoli, and radish, were consumed in quantity by Romans and pollen has often, although not always, been found at Roman sites (cf. Russo Ermolli et al. 2013). The presence of these taxa in the plant record, together with those of fruit trees described above, suggest that a small area was possibly also used for some horticultural practices, perhaps a kitchen garden.

Non-Pollen Palynomorphs

Spores and hyphas of fungi, spores and other elements of algae and zoomicroremains were present but low in all samples (Table 9.6). All the identified non-pollen biological remains totaled ca. 1,200.

Fungi (17 morphotypes plus some undifferentiated spores, ca. 2,681 NPP/g on average) were present in most samples. Most represented are *Glomus* and *Coniochaeta linaria*: the first is an indicator of soil erosion, and the second one lives on decomposed wood. Sordariaceae undiff. are coprophilous fungi, including *Valsaria* and *Chaetonium*, and were found in almost all samples in good quantities. It is noteworthy that *Valsaria*, which is often found in deposits formed under eutrophic wet conditions, prevails in the channel; *Chaetonium*, though in low quantities, is an indicator of fire.

Algae (7 morphotypes) concentration was low (553 NPP/g on average). All samples contain the *Pseudoschizaea* (or *Concentricystes*), an anthropogenic indicator of soil erosion, that lives in fresh water or moist environments (Grenfell 1995). All samples also contain HdV181, which lives at the surface of water, as well as HdV984. Also, HdV182 is fairly common. The other algal remains are scattered in the samples.

Zoomicroremains (4 morphotypes) were few (88 NPP/g on average) and included presence of parts of animals (mandibles, appendages, and hair) and some invertebrate organisms. In the samples from the channel, there are some parasite eggs of *Capillaria* and *Dicrocoelium*. The latter one includes roundworms and parasites of domestic animals and rodents, while human infection can occur under poor hygiene conditions (capillariasis). In PT11/11, a hair of beetle, *Trogoderma*, was found: its larvae in the early stages of maturation may cause damage to stored food.

Microcharcoal particles

Microscopic particles of charcoals >125 μm, indicative of local fires, are present in all samples except PT11/7 bis (Table 9.6). However, the concentration is very low ca. 300 ch/g on average.

Table 9.6 Podere Terrato, non-pollen palynomorph and microcharcoal analysis (AMM/ER).

PODERE TERRATO Non-Pollen Palynomorphs and Microcharcoals												
Sample (PT)		*P1*	*P2*	*P3*	*P4*	*P5*	*P6*	*P7*	*P8*	*P9*	*P10*	*P11*
Area		Drain					Structure/Yard					
Stratigraphic Unit		8028	8021		8020	8022	8012	8010	8004	8012	8010	8004
Depth - cm		55	42	34	20	20	44	30	13	60	39	14
NON-POLLEN PALYNOMORPHS (concentration NPP/g)												
FUNGI	*Amium*, *Ascospora*, *Chaetonium*, *Coniochaeta* (incl. *C. linaria*), *Delitschia* type, *Gelasinospora*, *Glomus* (incl. *G. fascicolatum*), *Pleospora*, *Scleroderma*, Sordariaceae indiff., *Sporormiella* HdV113, *Valsaria variospora* type, *Tilletia*, *Urocystis*, HdV265, HdV16, HdV35, Fungal spores indiff.	583	313	414	745	6290	2252	3984	4461	1777	3549	5127
ALGAE	HdV181, HdV984, HdV182 cf., *Pseudoschizaea*, *Spirogyra*	758	522	474	440	2026	294	477	1338	528	904	492
ZOOMICROREMAINS	*Capillaria*, *Dicrocoelium* Fragments of invertebrates indiff., *Trogoderma*	233	104	89	169	107	13	0	0	18	33	232
	Total Concentration of classified NPPs (NPP/g)	**1573**	**940**	**977**	**1355**	**8422**	**2559**	**4462**	**5799**	**2322**	**4486**	**5852**
MICROCHARCOALS												
	125–200 µm (ch/g)	204	235	30	678	426	38	167	446	35	0	261
	201–500 µm (ch/g)	0	0	15	68	107	0	24	446	0	0	0
	Total Concentration of microcharcoals (ch/g)	**204**	**235**	**44**	**745**	**533**	**38**	**191**	**892**	**35**	**0**	**261**

Macroremains

Six samples from six layers were examined; due to the larger quantities of material in the third fraction (0.25 mm), 3 samples (SU 8026, 8021, 8028) were split into smaller subsamples (Table 9.7). A few uncharred seeds and fruits were preserved in the deposit, and, in general, the remains show poor preservation. Only pip fragments were found charred. The total number of remains is low (281 records in 165 liters). Therefore, there is no clear evidence of plant accumulation or processing in site.

There is an interesting record of *Vitis vinifera*, found in traces in four samples as broken pips and small pieces, but it is too scanty to support plant transport/processing on site. Cereals are absent, and crop fields are not evident from seeds/fruits. As with the other sites in the area, the archaeobotanical record is dominated by seeds and fruits of herbaceous plants from ruderal environments and pasturelands. The species *Brassica* sp. and *Helminthotheca echioides* are weeds typical of ruderal environments and fields. Importantly, there are genera and species of Fabaceae, that may have been cultivated as fodder (in particular *Trifolium*).

Unlike the other sites, however, Podere Terrato had some evidence for the cultivation of edible plants for humans: two vegetables *Apium graveolens* (celery) and *Atriplex hortensis* (orache) were found, as well as the flower *Geranium*. This corresponds with similar or overlapping pollen evidence.

9.9 Coins/Small Finds (SCE)

Although a small, single-phased site similar to San Martino and Poggio dell'Amore, Podere Terrato differed in having more abundant finds of metal, coins, and glass. The metal and glass finds all come from four contexts: the topsoil transition (SU 8001, 8004), the lens of carbon-rich occupation within the house (SU 8003), the yard fills located to the south of the structure (SU 8007, 8026), and the bottom and sides of the drain (SU 8022, 8028).

The coins from Podere Terrato comprise a set of five well preserved, small-denomination bronze

Table 9.7 Podere Terrato, macroremains analysis (AMM/RR).

PODERE TERRATO Macroremains							
Sample (PT)		***M1***	***M2***	***M3***	***M4***	***M5***	***M6***
Area		**Structure/Yard**		**Drain**			
Stratigraphic Unit		**8003**	**8026**	**8021**	**8020**	**8022**	**8028**
Sediment volume (liters)		20	45	20	20	20	30
Vitis vinifera	grapeseed	1				1	(1)
Rubus fruticosus aggr.	endocarp			(1)			
Fruit trees		**1**		**(1)**		**1**	**(1)**
Tilia cordata L.	fruit					1	
Conifers	seed	1					
Other trees		**1**				**1**	
Apium graveolens L.	mericarp			(4)			(1)
Atriplex hortensis L.	achene			(1)			
Vegetables s.l.				(5)			(1)
Ajuga chamaepytis (L.) Schreb.	mericarp	1		(1)	1	3	
Anagallis arvensis L.	seed	32		(1)	4	5	(1)
Euphorbia peplus L.	seed			(2)			
cf. *Filago* sp.	seed					1	
Fumaria officinalis L.	seed	1				4	
Geranium cf. *columbinum* L.	seed	3					
Geranium sp.	seed	2					
Hedysarum coronarium	legume		1				
Helminthotheca echioides (L.) Holub	achene	80		1(1)	1	2	
Lotus corniculatus L.	seed	1					
Malva sp.	seed			(1)	2		
Medicago sp.	seed						
Melilotus cf. *alba*	seed				1		
Pimpinella sp.	seed			(1)			
Polygonum aviculare group	achene				2	1	
Thymelaea passerina (L.) Coss. Germ.	seed			(2)			
Trifolium arvense L.	legume						
Trifolium campestre L.	legume	2	(1)		1	1	
Trifolium hybridum L.	legume			(2)		1	
Trifolium cf. *incarnatum* L.	legume	5					
Trifolium micranthum L.	legume	1					
Trifolium pratense L.	legume					1	
Trifolium repens L.	legume	1					
Trifolium sp.	chalice						
Verbena officinalis L.	mericarp	2		2(1)	1	4	
Ruderals s.l.		**131**	**1(1)**	**3(12)**	**13**	**23**	**(1)**

Table 9.7 cont'd Podere Terrato, macroremains analysis (AMM/RR).

PODERE TERRATO Macroremains							
Sample (PT)		***M1***	***M2***	***M3***	***M4***	***M5***	***M6***
Area		**Structure/Yard**		**Drain**			
Stratigraphic Unit		**8003**	**8026**	**8021**	**8020**	**8022**	**8028**
Sediment volume (liters)		20	45	20	20	20	30
Callitriche sp.	achene						1
Carex sp.	achene	2	(1)				
Leersia oryzoides (L.) Sw	caryopsis	8					
Wet Environments		**10**	**(1)**				**1**
Medicago minima L.	legume	3				1	
Other Environments		3				**1**	
Brassica sp.	seed	33		(2)	1	5	
Poaceae-wild group	caryopsis	7			2	2	
Persicaria sp.	seed	2					
Primula sp.	seed				4		
Umbelliferae sp.	seed			(2)			1
Alia		**42**		**(4)**	**7**	**7**	**1**
UNDETERMINED		3			1		1(2)
TOTAL		**191**	**1(2)**	**3(22)**	**21**	**33**	**3(5)**

(x) = number of records found in the 3rd sieve from which 100 ml were observed

issues dating to the Julio-Claudian period (Fig. 9.16). All of the coins were located in secondary/tertiary contexts and can be seen as random losses, whether throughout the duration of the site's occupation or clustered toward its final moment of abandonment. The earliest is an Augustan *quadrans* issued in 9 BC (SF 208001) and an Augustan *as* dated to 7 BC (SF 208004). A Tiberian *as* (SF 208002) dated to 22–23 AD (SU 8002) bears the image of Drusus the Younger, an issue which was also found in the topsoil at Marzuolo (SF 211002). The last two issues are a *dupondius* of Gaius dated 37–41 AD (SF 211005), of the common type celebrating the recovery of the standards by Germanicus and his triumph in 17 AD, and a *dupondius* of Claudius dating to the duration of his reign, 41–54 AD (SF 211003).

Aside from two iron nails, the metal finds from Podere Terrato were all copper alloy items. Noteworthy are fragments of three copper alloy fibulae (SF 308001, 308003, 308010), two of which are of the Aucissa type, datable from late 1st c. BC to the first half of the 1st c. AD (Fig. 9.17). Both of these fibulae are lacking their pin, and the extant bow is heavily worn. Additional finds include a copper alloy cord or wire (SF 308009), one ring (SF 308004), probably a finger ring, as well as one small pin (SF 308002), and fragments of a chain (SF 308011). It is important to note here that at least two, if not more of these items are associated with personal dress, making the overall composition of the small finds assemblage from Podere Terrato peculiar within the panorama of sites excavated by the project. The attestation of domestic or personal artifacts might suggest a more permanent mode of occupation than the smaller sites of San Martino, Poggio dell'Amore, and Colle Massari, which were largely lacking in coinage and metal finds. At the same time, the dearth of nails and iron slag as well as degraded fragments of lamina suggest the absence of activities like craft production, which has left no trace on the site. Small finds associated with agricultural production are also lacking, but this is not unusual given that agricultural tools

Fig. 9.16 Podere Terrato, coin finds (SCE).

Fig. 9.17 Podere Terrato, fibulae of Aucissa type (SF 308003, 308010) (SCE).

and implements, otherwise clearly identifiable from known archaeological examples and their representation in visual depictions (White 1967, 1975), were not discerned clearly in the RPP small finds assemblage overall. The absence of production and the prevalence of domestic artifacts, in conjunction with its small size, make Podere Terrato a fairly noteworthy rural site.

9.10 Glass (SCE, ERR)

Podere Terrato yielded 20 fragments of vessel glass (17.5 g, EVE 0.28), with no examples of window glass. Grouping these twenty fragments into shard families across all contexts gives 4 MNI for vessels, which include a colorless bowl or cup, a sky-blue carinated bowl or cup, a brown ring base, and a light green unidentifiable vessel. The diagnostics are consistent with a date in the first half of the 1st c. AD: SF 408002, a yellow ring base, SF 408007, a tubular rim fragment of a blue green bowl (cf. Cool 2016:140), as well as a body shard of a cast vessel with ribbing on the exterior, sky blue in color.

9.11 Building materials (AA)

The walls at Podere Terrato were composed of (Fig. 9.18):

1. A majority (80–90%) of crystalline sandstone and hard conglomerates.
2. Occasional presence of pebbles and boulders.
3. Occasional presence of blocks of dark, grey, marly limestone with crystalline veins.
4. Travertines.

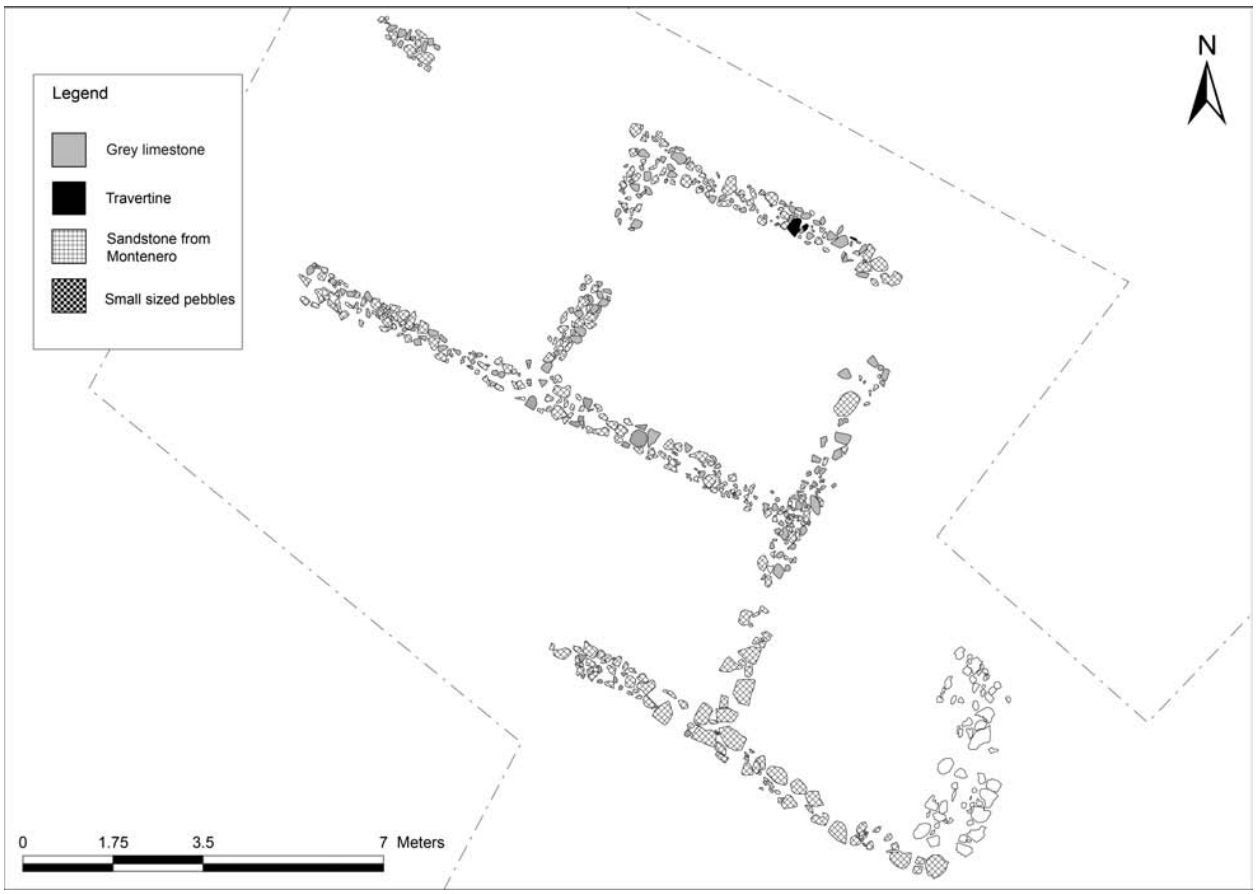


Fig. 9.18 Podere Terrato, plan showing various types of building stones (ERZ/MS).

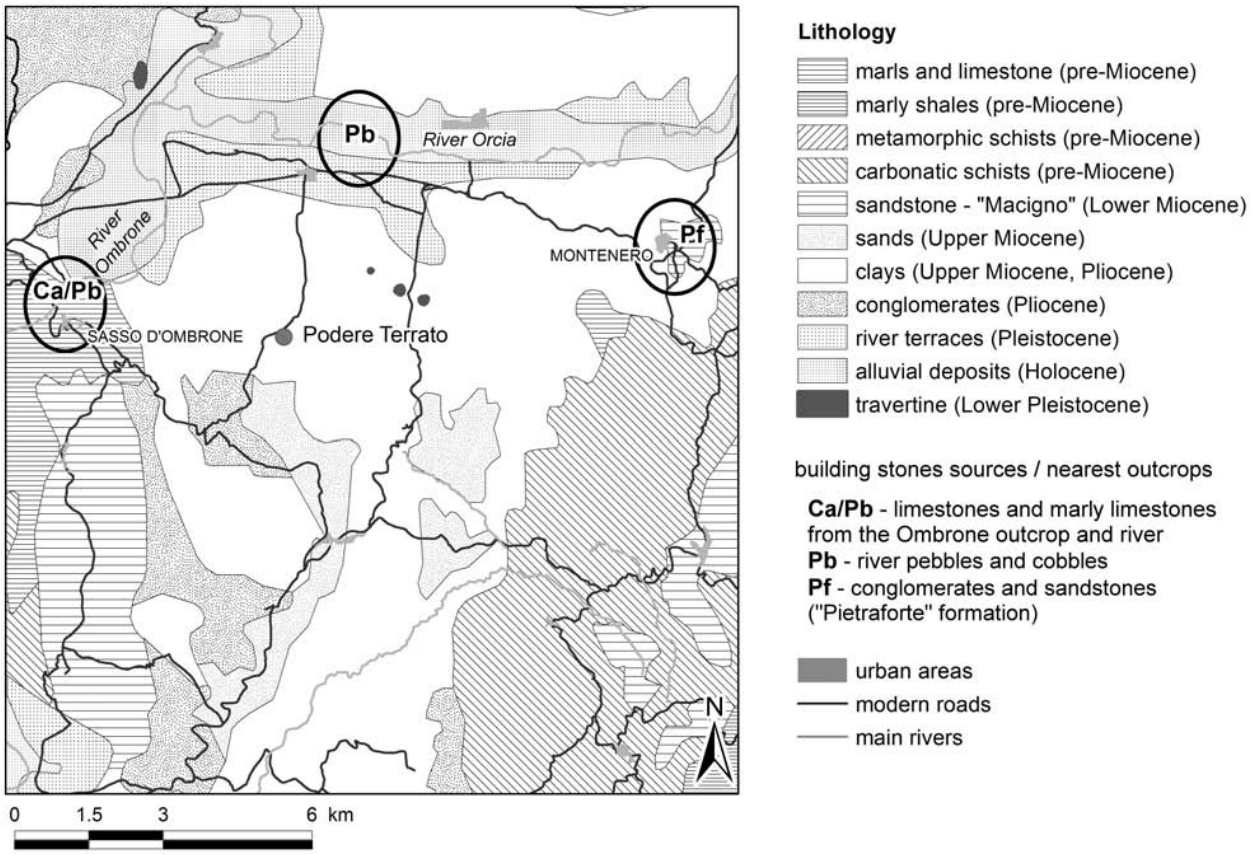


Fig. 9.19 Podere Terrato, map showing map showing nearest geological outcrops of building stones (AA).

The plausible origin of the dominant group of building stones, the crystalline sandstone and hard conglomerates, is the area of Montenero. The blocks of marly limestone derive from the natural outcrop along the Ombrone, while the pebbles and cobbles may have been collected directly from the riverbeds of the Orcia or Ombrone. The action radius in aerial distance is 4.5–8 km (Fig. 9.19).

9.12 Discussion (KB)

Despite the erosional damage evident everywhere in the material record, the cumulative analysis of that record suggests a site closer to the "permanent" side of the habitation spectrum than its neighbors San Martino and Poggio dell'Amore.

Architecturally, it is distinguished by having two separate, seemingly tile roofed spaces: Room 1 and the porch, Room 2. Thus, unlike its sister sites, it was constructed with two different kinds of spaces—one closed and one open. The other "rooms" with their L-shaped form are probably best identified as terraces and with the additional information from the pollen and macroremains, may have served as the beds for the flowers and vegetables that surrounded the site. Owing to the erosional damage to the site, nothing in the way of hearth, storage or other installations survive, only the multiple leveling efforts to the exterior yard.

The likelihood of this garden, either built in these terraces close to the house or elsewhere, is one of the stronger arguments for greater permanence. While gardens or fruit trees obviously do not require the daily presence of humans, the herbs and flowers grown here speak to seasoning and aesthetics, rather than only to foodstuffs and, thus, to groups or individuals around to enjoy them.

Similarly, the material culture of the site—ceramics, coins, metal, and glass finds—describe a more materially robust and processually complex footprint of occupation. The quantities alone are

important—even in its eroded state Podere Terrato yielded 35% more ceramics by sherd count than San Martino, 250% more than Poggio dell'Amore, and double that of the much larger Pievina Phase 1. Dining activities dominated that profile, both in glass and ceramic. Several metal items (fibulae, ring, and pin), likely used for clothing, provide evidence of dressing. Finally, as at Pievina, the inhabitants also carried about with them low denomination coinage, used in the course of daily small-scale transactions.

It is significant in the case of the fibulae and the coins that these items were discarded or lost, only to find their way into the leveling layers of the small yard. Not only were these items available, but enough so to make replacement possible. Likewise access to fine wares (some perhaps from Marzuolo), glass drinking cups as well as coins, describes an access to consumer goods that we have found at every site throughout the project. Finally, the presence, although small in number, of equid remains indicates transport and/or plow animals.

Given the likelihood of a small garden, some fruit trees, dining, dressing, and other activities, the absence of some markers is puzzling. Why there should be so few cooking pots and storage vessels is strange when the aforementioned activities, carried out over any period of time, would seem to require them. Most puzzling, however, is the absence again of faunal materials. In this case, the high degree of post-depositional erosion, also evident in the extant examples, may help to account for this.

As the geological evidence suggests, this was a particularly ground-water rich area that proved both a benefit and a challenge. The site may have been chosen to take advantage of local groundwater for gardening and agricultural purposes, but as the drain is evidence, the constant and multiple seepage points throughout the area required careful draining and management. This impulse to carefully manage hydrological resources we have also seen at Pievina and Colle Massari.

The nearby field drain also suggests that the structures of Podere Terrato lay amongst or beside agricultural fields. While this might seem obvious in the case of small rural buildings, inhabitants of such structures might work fields at some distance from their lodgings, and, at least in Italy, it has been rarely possible to identify the exact spaces of agricultural use. Indeed, the drain at Podere Terrato and possibly that at Colle Massari, represent some of the first evidence for field drains and, thus, for field systems of Roman date in central Italy. Those fields, the pollen evidence suggests, were occupied by grapes as well as cereals, fodder crops, and pasture.

While Podere Terrato may have had a more permanent population than its sister sites, its occupation may have been similarly short. Again, we are hampered by small ceramic assemblages and poor stratigraphy that do not permit the distinction of residual items from the occupation-phase materials. The total picture of coins, ceramics, and a mono-phase architecture suggests a span ranging ca. 50–70 years in the first half of the 1st c. AD. After it was abandoned, the site probably swiftly succumbed to the water runoff from the hill above.

Although distant in space but more or less contemporary in time, it is worth noting a very similar site found in southern France, near Nîmes (Raynaud 2009:145). Chemin de Coudou was a two-room structure, measuring some 25 m^2, with a well and possible pond set adjacent. Nearby, a series of intersecting ditch and other alignments have suggested a garden and the building, well and pond have been interpreted as an agricultural annex associated with the working of that garden and the adjacent fields. While they differ in some details—the pond versus yard, and the quantities of material culture—Podere Terrato and Chemin de Coudou both attest to yet another heretofore unknown rural building type, a kind of field house supporting the cultivation of both a garden and more extensive nearby fields.

10

Marzuolo[1]

10.1 Situation (AA, MG)

The site of Marzuolo is located upon an elongated strip of middle terrace of the Orcia, close to the inflow of the Ribusieri tributary from the S (Fig. 10.1) in the N part of the study area. The extension of this platform is about 50 ha. Altitudes upon the terrace gradually rise from W to E, ca. from 110 to 120 m asl, and stand about 15–20 m above the Orcia river floor. It is bordered by the steep slope of the Orcia River cut to the N and more gradual slopes to the S and W.

Like Case Nuove, the position of Marzuolo is notable for its proximity to transportation routes in and out of the study area. The modern E-W connection Paganico to Castel del Piano road ("strada provinciale Cipressino") crosses the Marzuolo terrace, with a bridge passing over the canalized section of the Ribusieri. This road was constructed after 1954, the year of the G.A.I. aerial photographs. Before that period, as is evident by the ca. 1825 Catasto Leopoldino (Fig. 10.2), the main road bypassed Marzuolo to the S along the present Via di Vallanzano. As discussed in more detail in Chapter 17, while not a main road by any means, Marzuolo was located adjacent a natural route passing into and out of the locale.

10.2 Remote Sensing

The site was discovered by Ghisleni in 2007 and consisted of three major scatters on either side of the modern road. The scatters were thick and consistent, composed of roof tiles, coarse and fine wares, large quantities of iron slag, and mill-stones with a ceramic density of 10–25 sherds/m^2 that extended some 2.5 ha. (Fig. 10.3). The most concentrated area appeared on the terrace described above (TU 100), but a large swath of material also extended down its S side (TU 403 and 402), on the other side of the modern road. Subsequent gridded survey suggested that much of this southern scatter was extremely attenuated (Fig. 10.4) and that the majority of the settlement may have been atop the terrace at TU 100. As part of a rescue excavation conducted by the Soprintendenza, Ghisleni also carried out a preliminary magnetometry survey and excavated two small trenches, one at the site's SE edge, the other further to the N (Fig. 10.5). The first trench uncovered well-constructed walls aligned NW by SE, composed of medium-sized cobbles, laid without mortar. Stratigraphy appeared well preserved, significant quantities of iron slag were found and material from the 1st c. BC to 1st c. AD was found associated with it. The second trench revealed

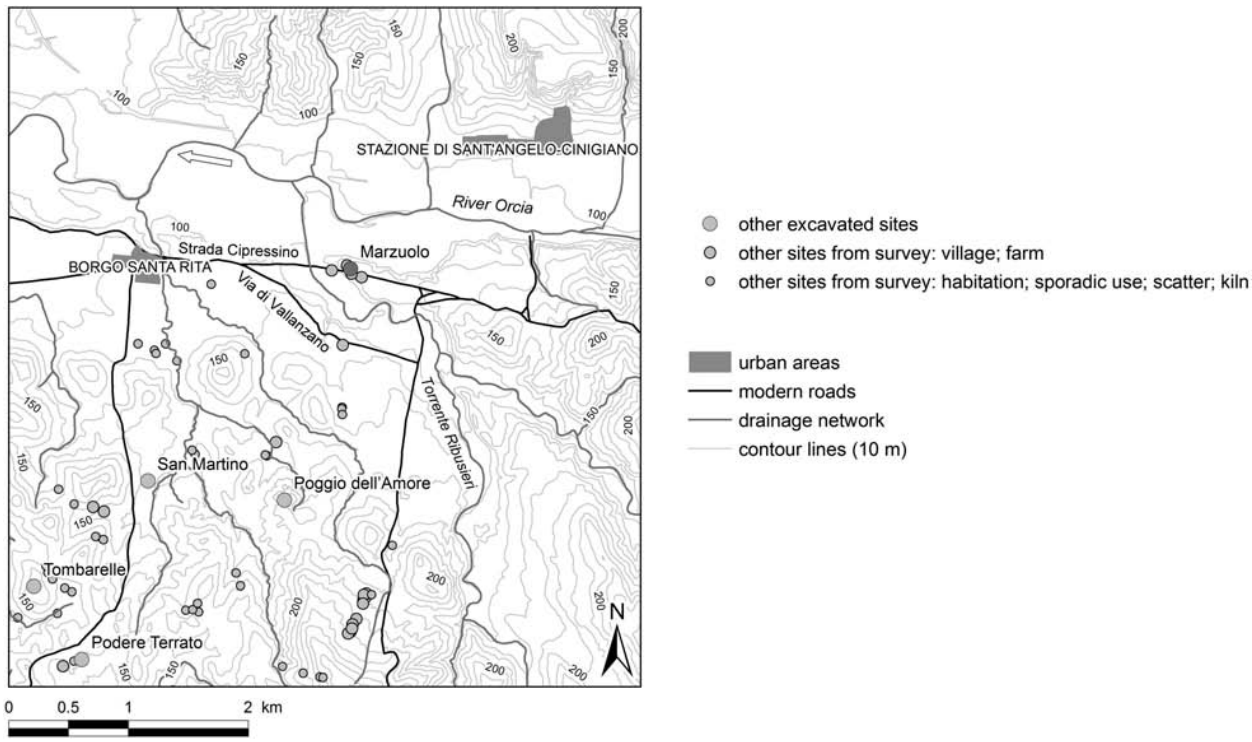


Fig. 10.1 Marzuolo, general topography and Roman sites (AA).

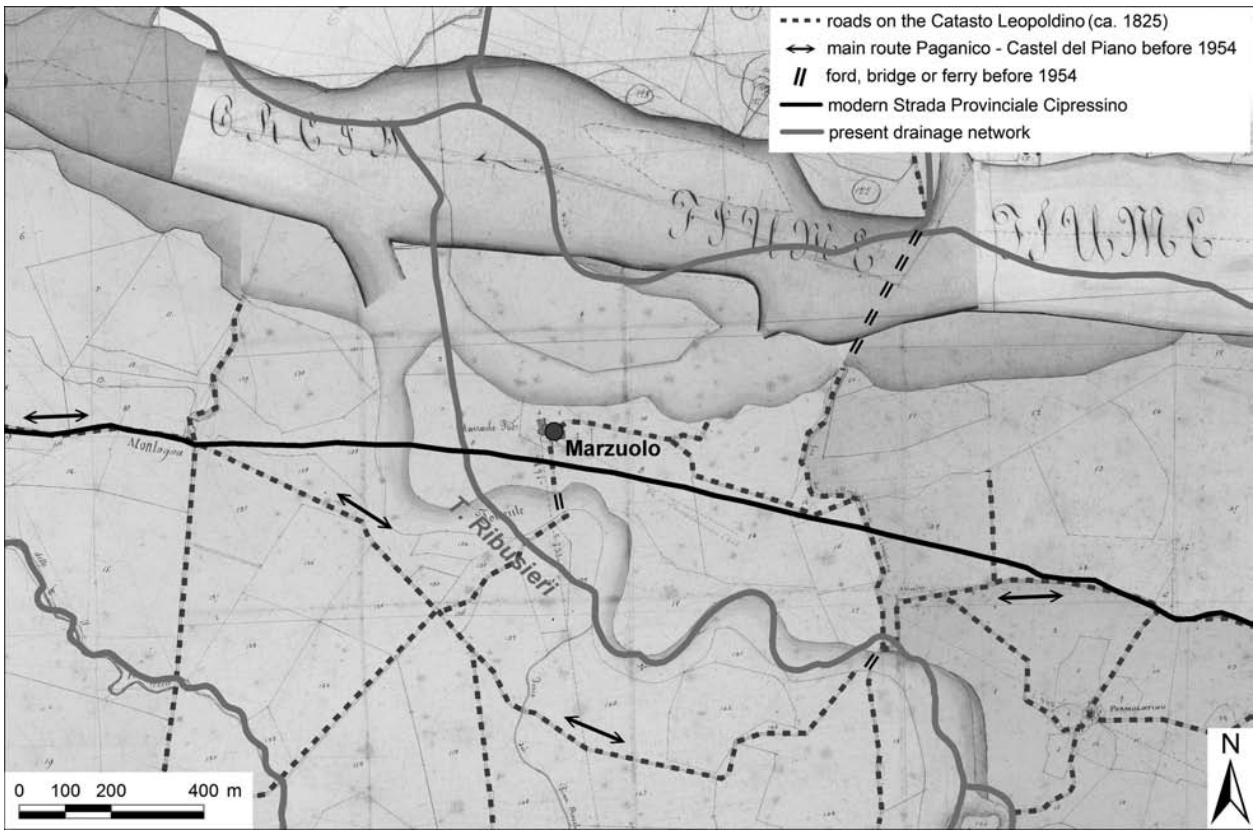


Fig. 10.2 Marzuolo, map of the Catasto Leopoldino (ca. 1825), showing location of the site and adjacent roads (AA).

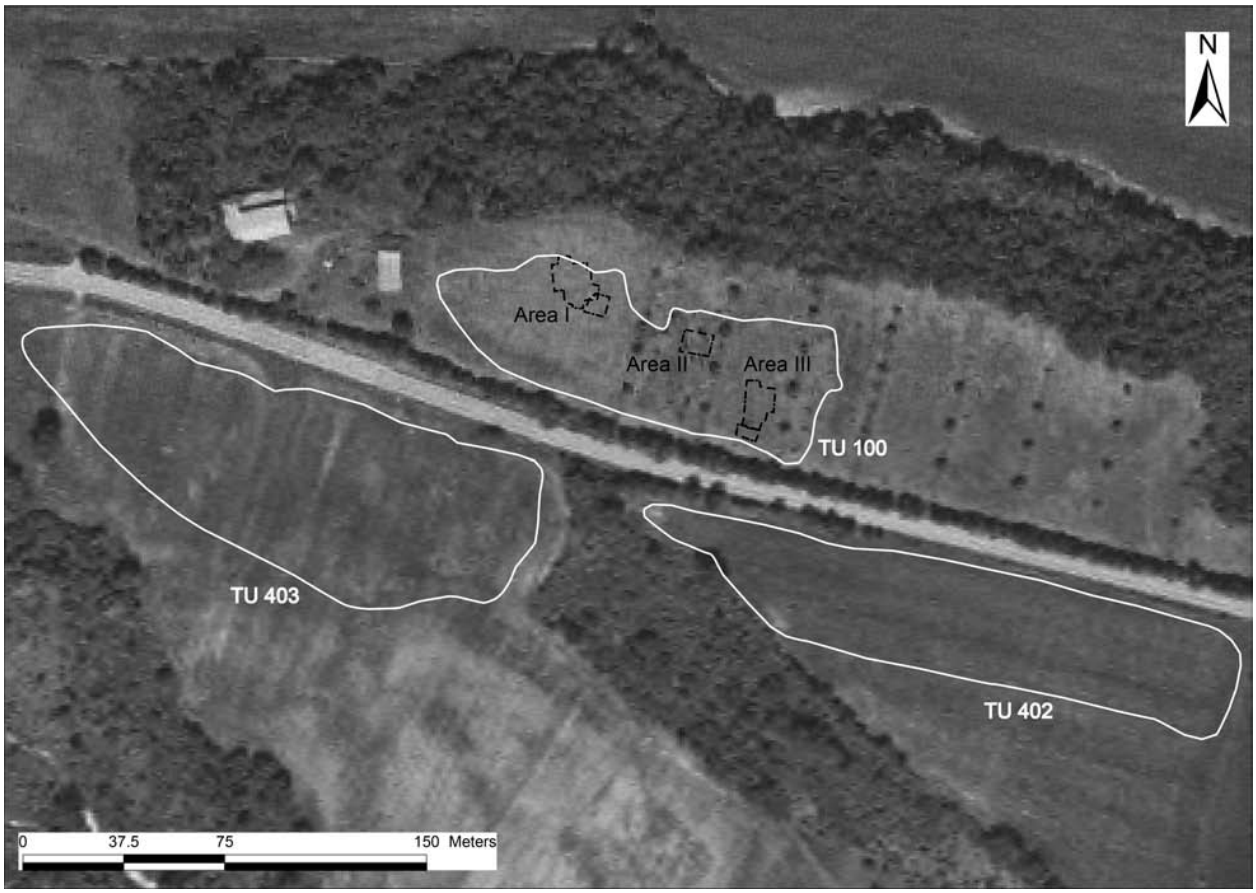


Fig. 10.3 Marzuolo, surface survey results (TU 100, 402, 403) (ERZ/MS).

a wall with similar orientation, also composed of cobbles without mortar but of bigger dimensions, and a well-preserved tile collapse.

Ghisleni defined the site as a "village" with possible craft activities and it was for this possibility that it represented an agglomeration of peasant homes that the project excavated the site in 2012–2013.

Beginning in 2012, two further campaigns of geophysics over TU 100 were carried out: a magnetometry survey prior to excavation in 2012, and a second Automatic Resistivity Profiling (ARP) survey—a high-speed, carted variant of resistivity—prior to the excavations of 2013. The magnetometry survey was laid out over three grids, one of 50 x 50 m and two of 50 x 40 m, laid out in a NW-SE line over TU 100. Eliminating from consideration the three parallel lines of circular anomalies representing modern olive and vine trenches, a major circular anomaly was detected in the NW part of Grid 1, and more dispersed anomalies in the southern-central portion of Grids 2–3 (see Fig. 10.5). Fewer anomalies were detected between these areas, despite the fact that the surface scatter continued. The size and shape of the NW anomalies pointed to a major kiln or other manufacturing space.

The ARP survey covered TU 400, TU 402, and 403, minus the areas uncovered in the 2012 excavations. The survey was carried out after the 2012 campaigns to clarify aspects of the site's plan, to provide further information about the area between the two excavated zones and to better determine the nature of the downslope site at TU 402–403. In TU 400, aside from NS readings resulting from the insertion of a modern olive grove, the 0.5 and 1.0 m deep surveys revealed at last two sets of linear E-W anomalies and at least four sets of intersecting N-S anomalies (Fig. 10.6). The survey in TU 402–403 produced no such linear anomalies, although other circular anomalies did indicate that the area contained buried remains.

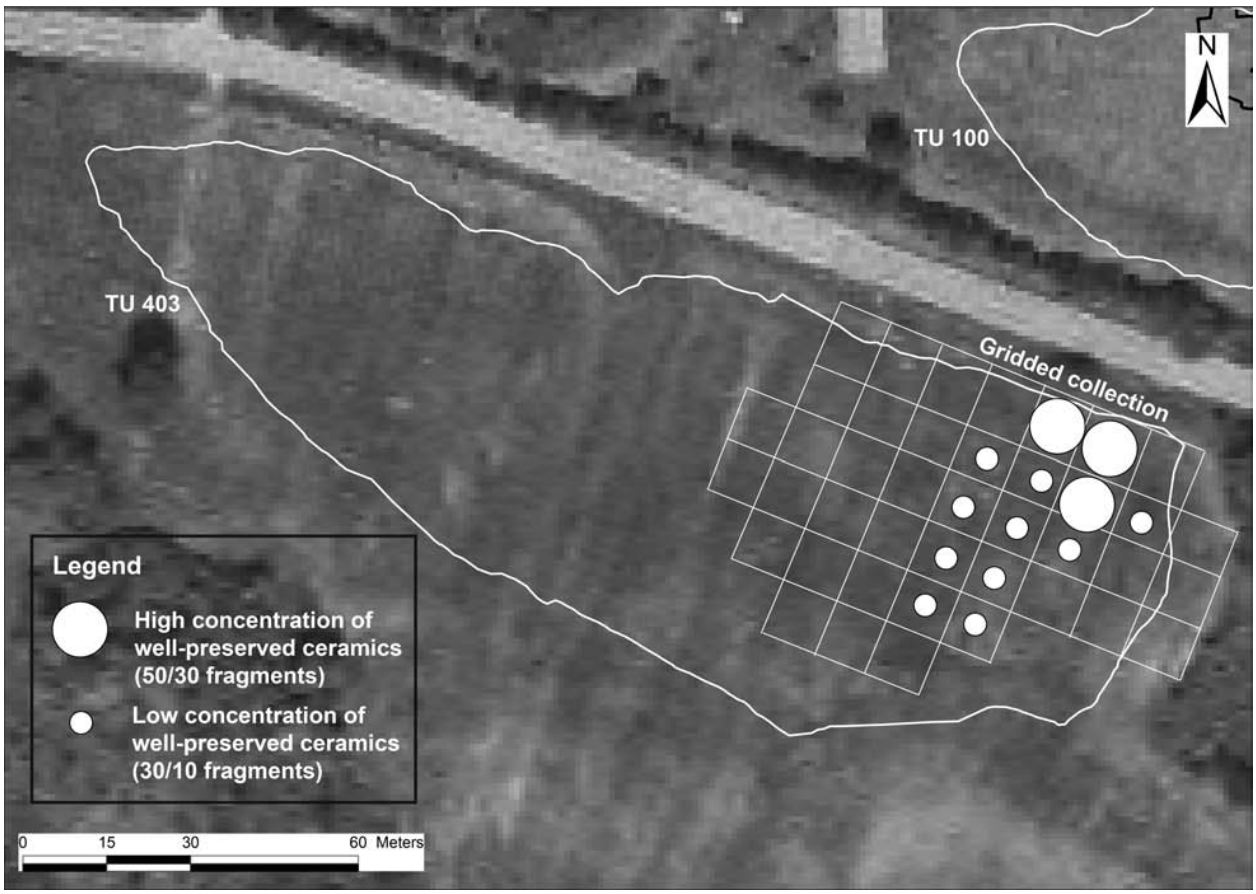


Fig. 10.4 Marzuolo, surface survey results and gridded collection of TU 403 (ERZ/MS).

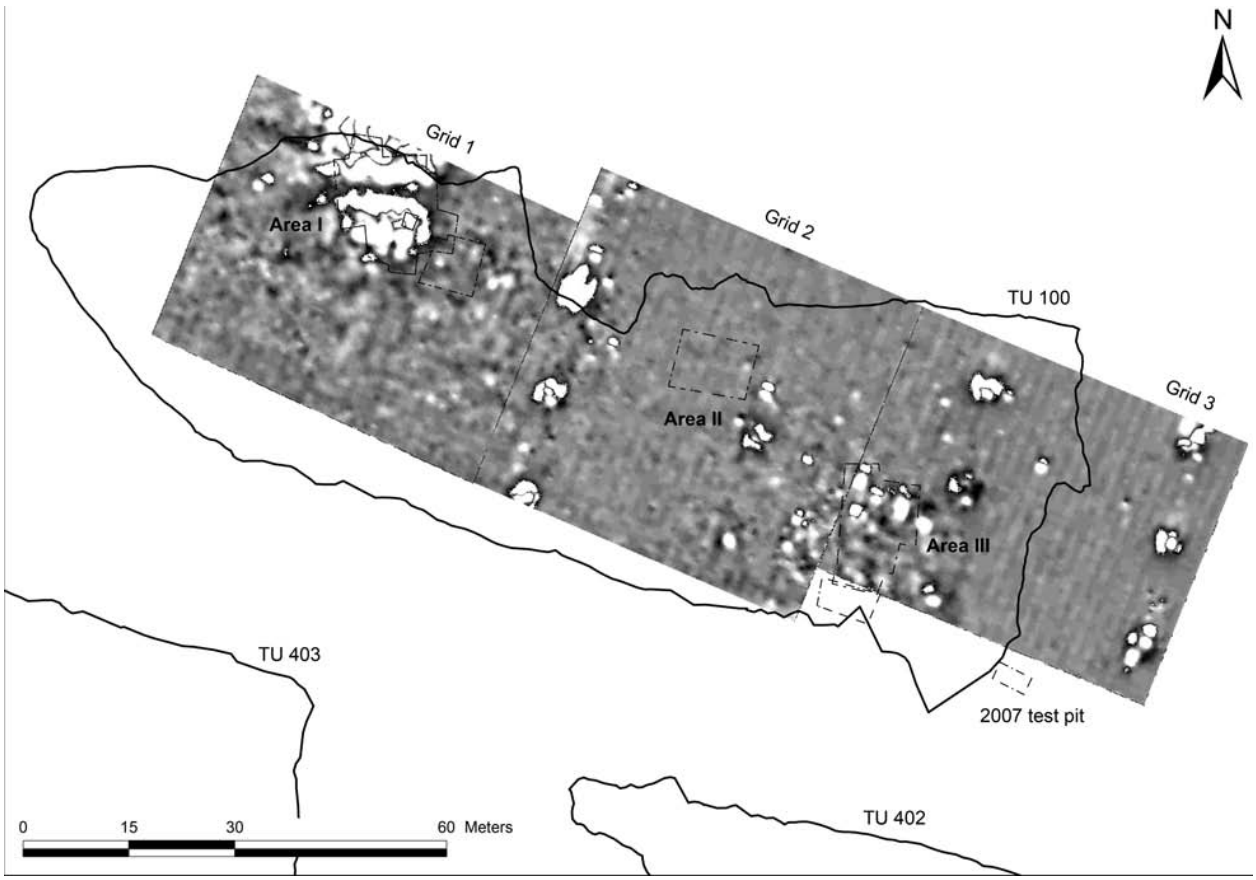


Fig. 10.5 Marzuolo, remote sensing results for TU 100, including surface survey and magnetometry survey. SE trench excavated in 2007 is also indicated (ERZ/MS).

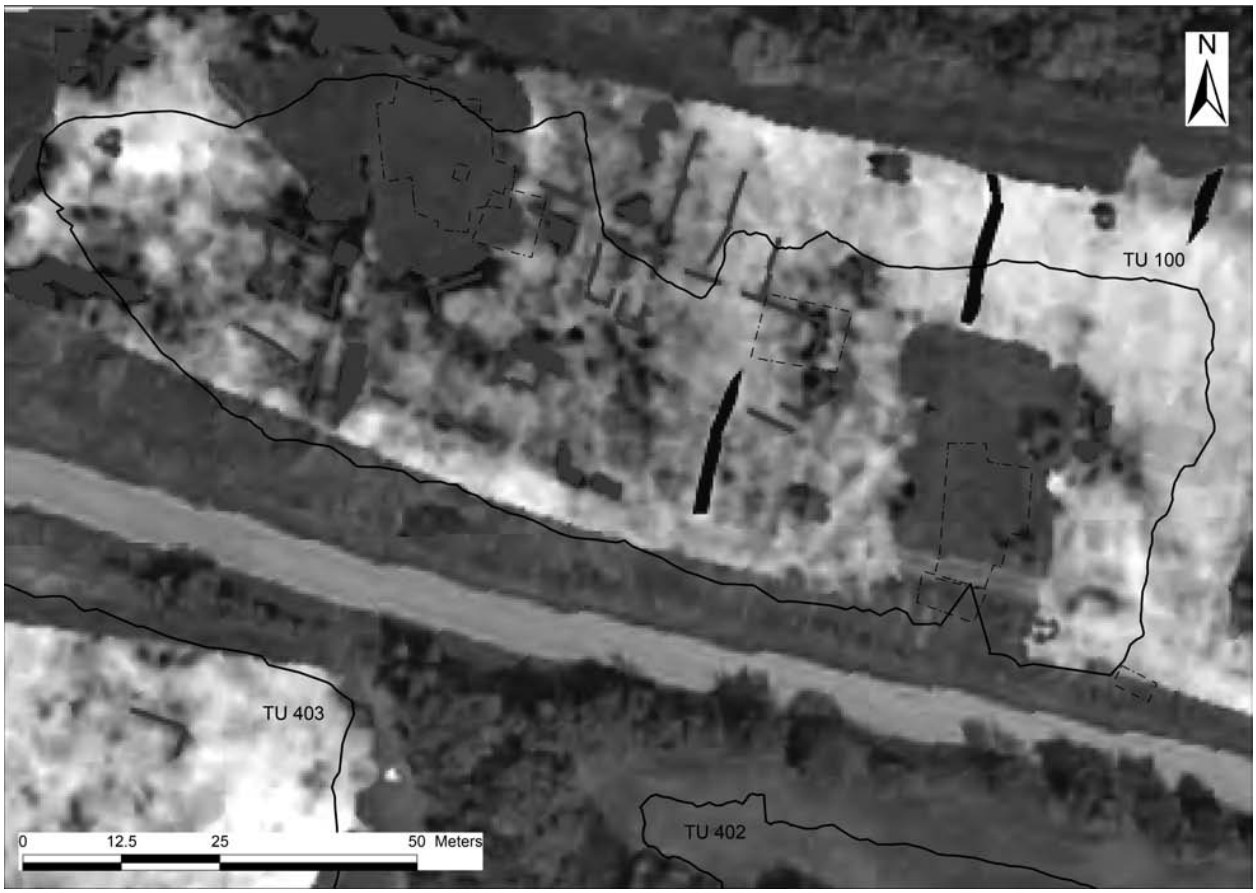


Fig. 10.6 Marzuolo, remote sensing results for TU 100, including surface survey and ARP survey at 0–0.5 m depth (ERZ/MS).

Thus, the remote sensing evidence provide two distinct but overlapping interpretations of the site's function: the surface survey suggested an agglomerated settlement like a village with evidence for metalworking; the magnetometry pointed further to industrial use at least in the NW part of the site; while the ARP indicated a planned settlement composed of a series of buildings laid out along a NW-SE axis. None of these survey methods revealed the site's major function: a planned manufacturing center for the production of Italic sigillata.

A detailed study of the ceramics from this site will be published in a separate volume. The site has subsequently been excavated further by two members of our team, who have started a special project on ceramic production and rural innovation. Preliminary reports on newly discovered areas have been published (Van Oyen and Vennarucci 2016, 2017) and analytical pieces are underway (Van Oyen 2020).

10.3 Excavation (KB, EV)

Excavation took place over two seasons (2012–2013) in three major areas across TU 100: Area I at the western edge of the site where the highest magnetometry anomalies appeared; Area II in the middle of the site; and Area III to the E over a second cluster of magnetometry anomalies (Fig. 10.7).

10.3.1 Area I

Excavations here revealed three major features: a church, a production area for ceramics (Trenches 1–3), and a complex of rooms of probable craft function built in rough *opus reticulatum* technique (Trench 4–7) (Fig. 10.8).

Structure 1, Church: As it lay outside the project's Roman remit, the church was excavated only

Fig. 10.7 Marzuolo, overall site plan with areas and trenches indicated (ERZ/MS).

to reveal the basics of its plan but without detailed soundings to determine its whole extent or chronology. The building was oriented E with seemingly a single nave, central apse and two flanking pastophoria (Figs. 10.9 and 10.10). All walls were cut into the earlier Roman levels with no foundation trenches, but what appears to be a mortar mixer was found in Trench 2 (see below). The walls were built with cobbles held together with a fine grey mortar and all the wall joins appeared to be bonded. The walls of the nave were either doubled in sections or had interior benches. If the former was the case, it may indicate that the building—or at least the nave—was rebuilt at some point. All the walls appear to be foundations; no traces of floors were found, which presumably existed at a higher level and were removed by either spoliation or plowing. No altar or other liturgical furnishings were found. At least one E/W oriented grave was located in the westernmost excavated area of the nave but was not excavated. Possible further graves were revealed but not excavated to the E of the apse.

Production Area

Trench 1 (Figs. 10.11 and 10.12): To the N of the church lay the largest anomaly detected in the magnetometry. Stratigraphy in this area was complex and not easily resolved, as the many contexts formed of oxidized earth, charcoal, and collapse overlapped one another. Covering the whole area lay a mixed horizon of broken roof tiles and stones, representing a disturbed collapse and destruction episode (SU 10020).

Beginning in the W part of the Area beneath the SU 10020 horizon lay a series of large, crudely fired

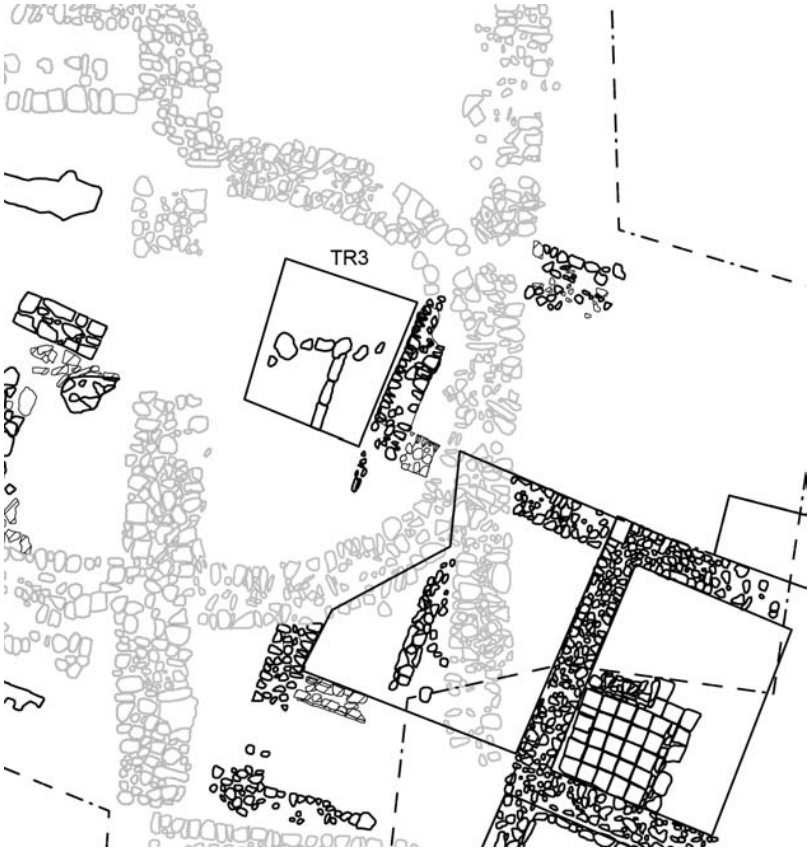


Fig. 10.8 Marzuolo, plan, Area I, phased plan (ERZ/MS).

Fig. 10.9 Marzuolo, plan, Area I, church (ERZ/MS).

Fig. 10.10 Marzuolo, aerial photograph of church and Area I after 2012 season (Photo by Paolo Nannini, reproduced by kind courtesy of the Soprintendenza per i Beni Archeologici della Toscana) (PN).

terracotta bricks, aligned approximately NW by SE (SU 10023). These bricks were V-shaped in cross section, suggesting they were used in the construction of arches or vaults (Fig. 10.13). Excavation beneath these revealed a rubble wall built of river cobbles (SU 10032), terminating with a large stone pier (SU 10060). Three meters to the SE of this pier was found the remains of a column (SU 10031) composed of circular bricks, cut into quarters and set atop the same roughly squared stone base as the nearby pier. Abutting these features was a consistent context of charcoal throughout the area (SU 10085), whose level corresponded with a similar charcoal level found in other parts of Area I (see below).

Within this charcoal context, deposited seemingly in phase with it, were found a number of spectacular finds. Leaning against the column were found a large bronze handle and remains of a large bronze pitcher (see below, SF 310144). To the E of the column were found 250 MNI of largely complete Italic sigillata cups and plates (SU 10093) (Figs. 10.14 and 10.15 and Color Figs. 10.15 and 10.16) (Vaccaro, Capelli, and Ghisleni 2017). These were found still stacked by vessel form, each stack lying approximately E/W. Each stack showed evidence of misfiring (black) beginning at the W end, gradually moving to better fired (red) vessels at the E end. This suggested that the vessels were very near a kiln and had been set down still in their firing stacks. A total of 146 vessels are stamped MANNEIUS, MANNE, MN or AˆMN, while three pots are stamped A. M ( ) URBANUS, 22 with L. VMBRICIVS H ( ) and one chalice with T. RVFRENVS (Vaccaro, Capelli, and Ghisleni 2017). Manneius and L. Umbricius Hospes are known from the workshops

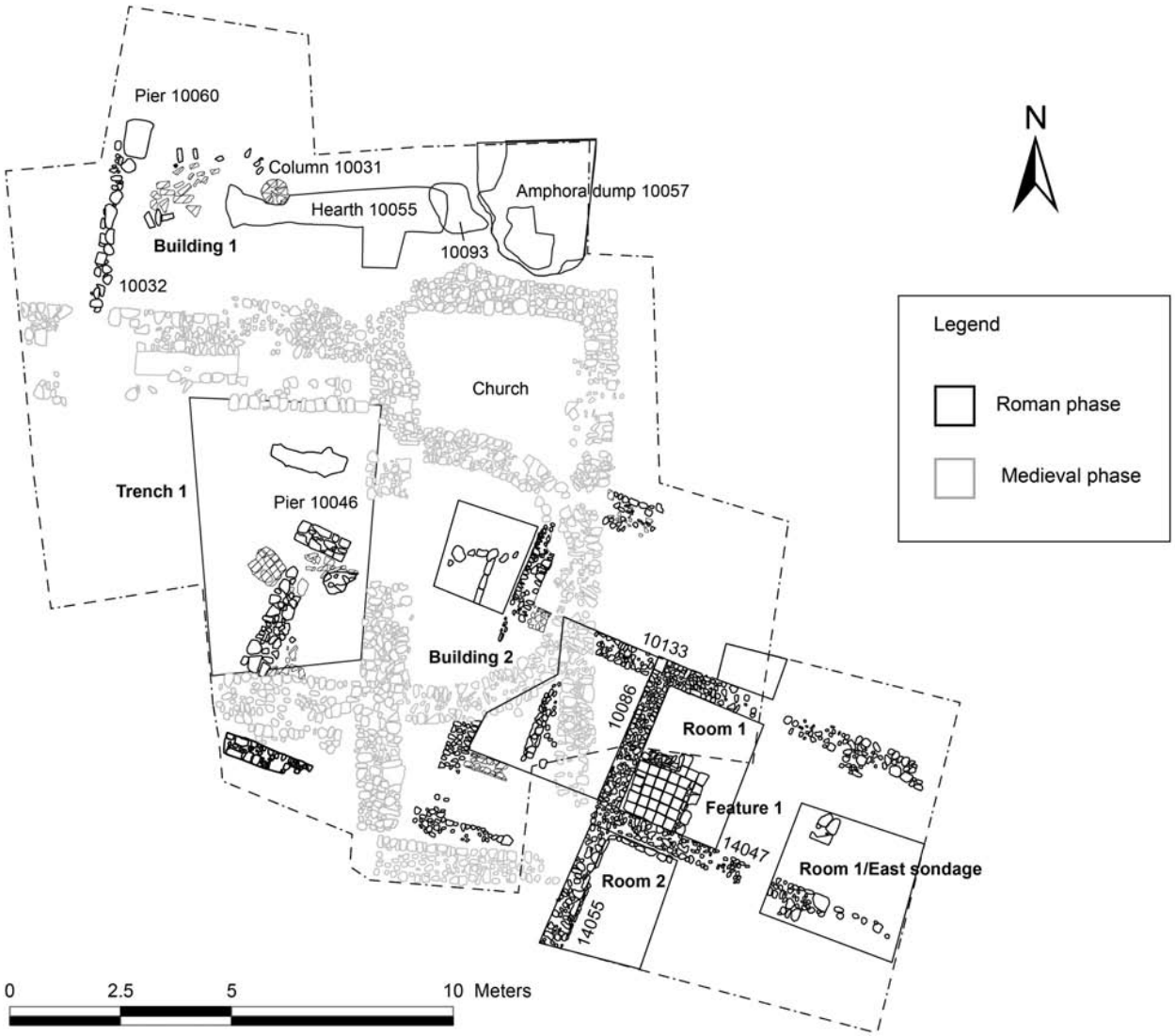


Fig. 10.11 Marzuolo, plan, Area I, Roman-period remains (ERZ/MS).

at Torrita di Siena, and Manneius and Rufrenus were also active at Arezzo (Pucci 1992:113–116, 143–145; Oxé, Comfort, and Kenrick 2000: #1099; 2470, 1730, respectively).

To the E of this ceramics deposit, a series of cuts (SU 10057, 10065, 10073, 10075, 10076, 10080, 10081, 10083, 10085) served as seats for an important group amphorae The cuts were made into a prepared surface (SU 10064) which preceded the collapse that covered the whole area (SU 10020).

To the W of the column, near wall SU 10032 and its nearby tile collapse (SU 10033), appeared another, stratigraphically higher level of charcoal, here in association with a large number of nails, faunal material, and ceramics (SU 10055). The area was interpreted as a small shed or roofed area, possibly abutting wall SU 10032, containing a hearth. Whether or not it existed in phase with SU 10085 and the deposition of the ceramics of SU 10093 or was inserted afterwards was unclear owing to the difficulty in connecting the contexts in the W and E parts of Area I. The ceramics from the hearth, however, were identical in chronology to the ceramics in SU 10093.

Trench 2 (Fig. 10.17): A large sondage was carried out inside the SE corner of the church nave. It revealed a large cut into the surrounding deposits composed largely of mortar, a cut which took place in phase with the church. The circular form of the

Fig. 10.12 Marzuolo, plan, Area I, Trench 1 (ERZ/MS).

mortar deposit suggests it may have been the remains of a mortar mixer used during the construction of the church and then covered by it.

The surrounding deposits, seemingly of Roman date, were otherwise undisturbed by the church-building activities. The first encountered was another series of mixed collapse contexts rich in tile (SU 10016/10039, 10002/10026) followed by a context of large, coarse terracotta bricks, arranged in a V-shape (SU 10066) (Fig. 10.18). While identical in shape and fabric to those found in Trench 1 (see above, SU 10023), these instead seemed to represent an in situ collapse of a vault. The later insertion of the church walls made the extent of the structure impossible to ascertain. Beneath these bricks was a thick, mixed context (SU 10035) rich in slag and reddened soil. The slag was of unknown content: very light, almost like pumice, it was characterized by a grey color and air-pockets, but without any exterior signs of vitreous materials. The red soil was probably oxidized by burning. Beneath this context lay a consistent level of charcoal (SU 10071), identical in level and consistency to SU 10085 in Trench 1.

A large stone pier (SU 10046) was found in the northern part of Trench 2 and appeared to have been cut into these deposits. Oriented NW by SE, it was hypothesized that this pier could be associated with the nearby *opus reticulatum* building (see below) as part of a portico that boarded that building's W side. A later, cruder stone wall (SU 10038) constructed of rough cobbles and no mortar, was found extending from this pier towards the SW, where it probably originally intersected part of the *opus reticulatum* building. A context of tiles (SU 10016) may represent a crude roof associated with this later structure. In form, the pier/wall/tile collapse arrangement closely echoed that found in Trench 1 (SU 10060/10032/10033).

Trench 3 (Fig. 10.19): Trench 3 was excavated into the apse of the church. It was intended to clarify

Fig. 10.13 Marzuolo, view of SU 10023, detail of terracotta bricks.

Fig. 10.14 Marzuolo, Area I, Trench 1, SU 10093.

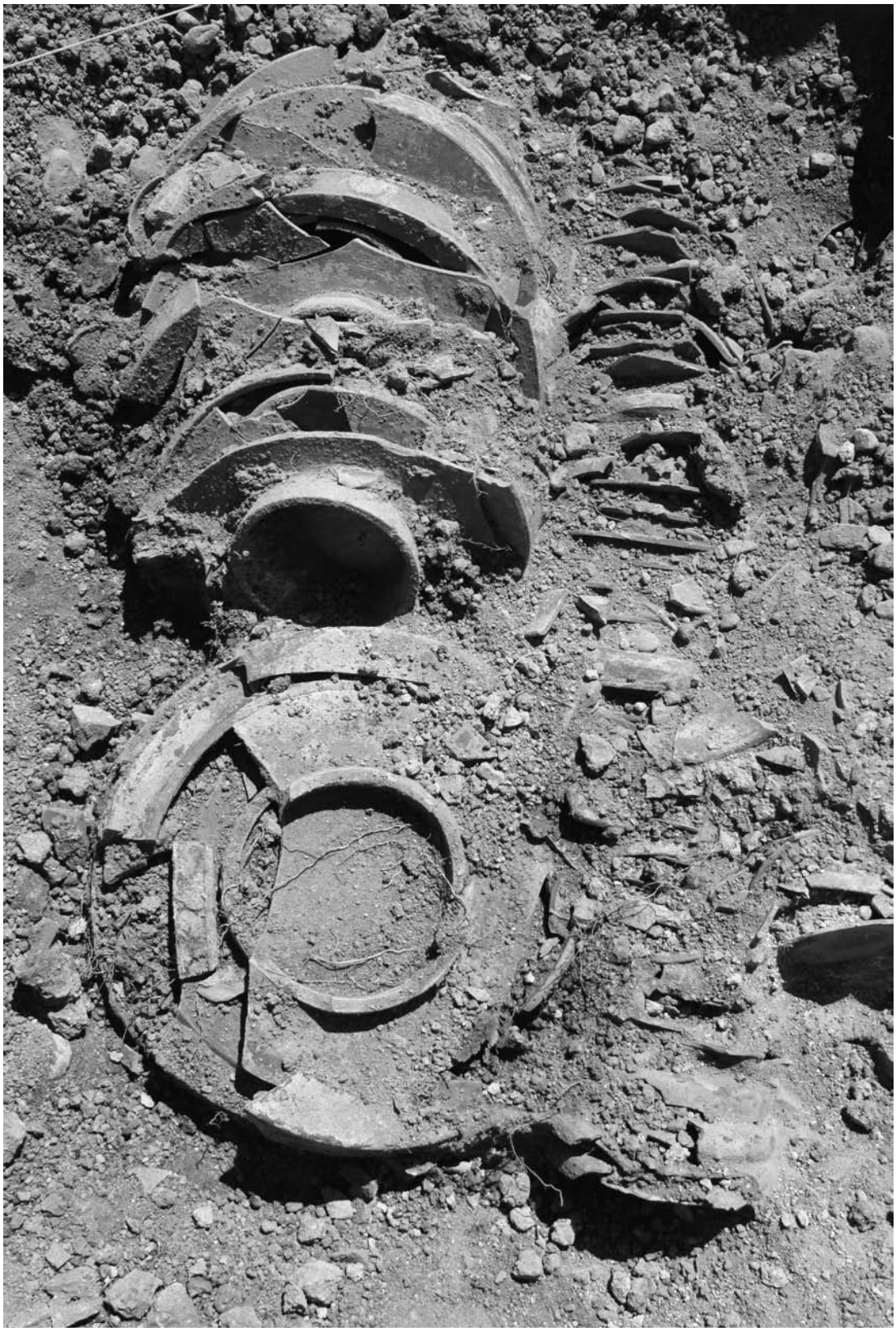


Fig. 10.15 Marzuolo, Area I, Trench 1, Italic sigillata from SU 10093 in course of excavation. (See also color insert.)

Fig. 10.17 Marzuolo, plan of Trench 2 (ERZ/MS).

the stratigraphic sequences in nearby Trench 2 down to the local geology and to understand the relationship between the ceramic production areas to the N and the *opus reticulatum* building to the E. Trench 3 was thus purposely sited to abut SU 10051—what appeared to be western-most wall of the *opus reticulatum* structure—and red oxidized contexts (SU 10103/10107) both characteristic of the ceramic production area to the W and N.

A series of oxidized red levels mixed with charcoal (SU 10109–10115) were found to clearly abut the *opus reticulatum* structure, at times staining its walls (Figs. 10.20–10.22). The same clear lens of charcoal was found here (SU 10114) at the same level as found elsewhere in the site (e.g., SU 10085, 10071). Immediately beneath SU 10114 lay a thick (0.75 m) layer of chocolate-brown, clayey material (SU 10116), with occasional small ceramic sherds and charcoal flecks, into which the *opus reticulatum* foundations were cut and which lay flush with the top of its foundations. A grey-yellow clay (SU 10122) beneath marked the local geological stratum.

When revealed here in an undisturbed section, the charcoal context SU 10114 was found to be relatively thin and highly consistent in its depth and character, pointing more toward a consistent use level rather than a collapse or destruction level. The fact that it lay immediately over the clean preparatory fill and burned it slightly, suggested that the activities it represented took place very soon after the completion of the *opus reticulatum* building.

As will be discussed below, no pollen was discovered in either the charcoal-rich context or any of the above oxidized contexts (SU 10109–10115), seemingly because it was destroyed by consistently high temperatures. This fact will have important implications

Fig. 10.18 Marzuolo, view of terracotta bricks (SU 10066) in Trench 2.

for the interpretation of these deposits and for the interpretation of this part of the site as a whole.

Structure 2: Opus reticulatum building

Around the edges of the church to the E and S were found a series of walls that predated and in some cases were cut by it. These were constructed in *opus reticulatum* style (Figs. 10.23 and 10.24), formed of small, roughly hewn limestone rectangular blocks, laid perpendicular to the line of the wall, forming the characteristic diamond-shape pattern on the wall's face (see Fig. 10.28). These walls were all oriented NW by SE (in distinction to the E/W orientation of the church). In 2013, a series of trenches were set out to clarify the plan and function of this structure.

While referred here throughout as *opus reticulatum*, the construction technique is somewhat rough, with the pyramidal *cubilia* irregular and often poorly fit together (Van Oyen 2020). Given the difficulties in dating the structure (see below), it is not clear whether this represents an early stage of the technique (so-called *quasi reticulatum*) or simply a less refined version made in a stone-poor region with difficult to work local river stone (Coarelli 1977; Lancaster 2008; Mogetta 2015; and see below).

Trench 4: Trench 4 was set in what appeared to be the best-preserved room of the *opus reticulatum* building (Room 1). The room was bounded to the W by SU 10086, to the N by SU 10086 and 14057 and to the S by SU 14047/14024. The southern limit seems to have been open as a wide door and bisected by a single pier (SU 14033) (see below, Trench 5).

The first context encountered below the plow soil was a thick, mixed stratum of large pieces of tiles and other rubbish (SU 14001–14007), seemingly a deliberate infill. Beneath this was found a series of ephemeral and thin levels (14008–14010), which seemed too thin to comprise occupation strata and no identifiable floor was found (Fig. 10.25). Beneath these lay a chocolate clay layer identical to SU 10116 (see Trench 3 above), here SU 10112/14012, into

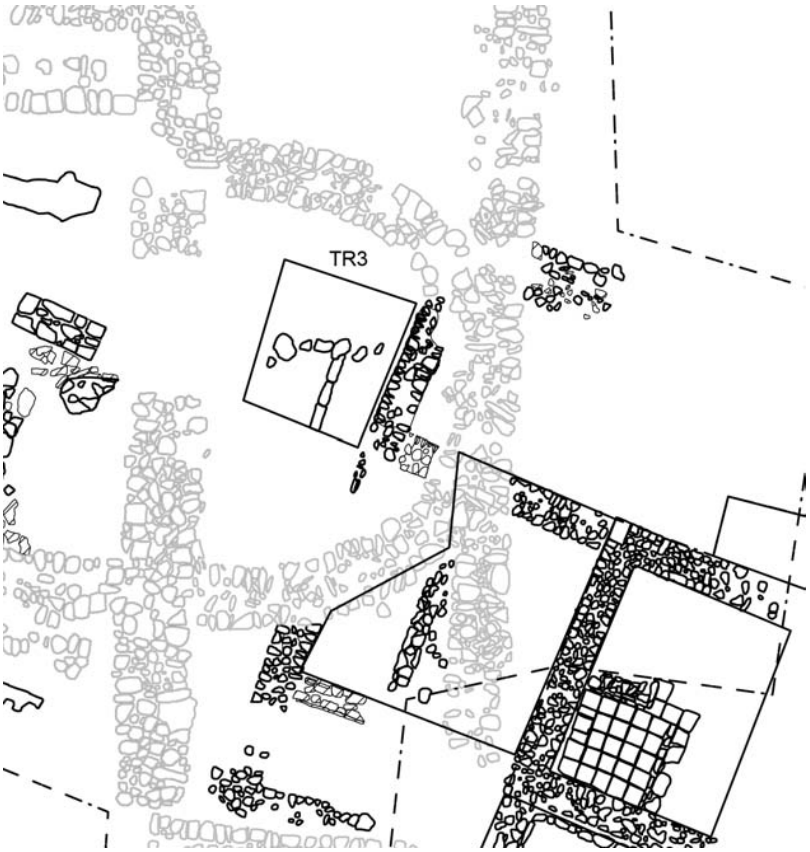


Fig. 10.19 Marzuolo, Area I, Trench 3 (ERZ/MS).

Fig. 10.20 Marzuolo, view from S, Trench 3.

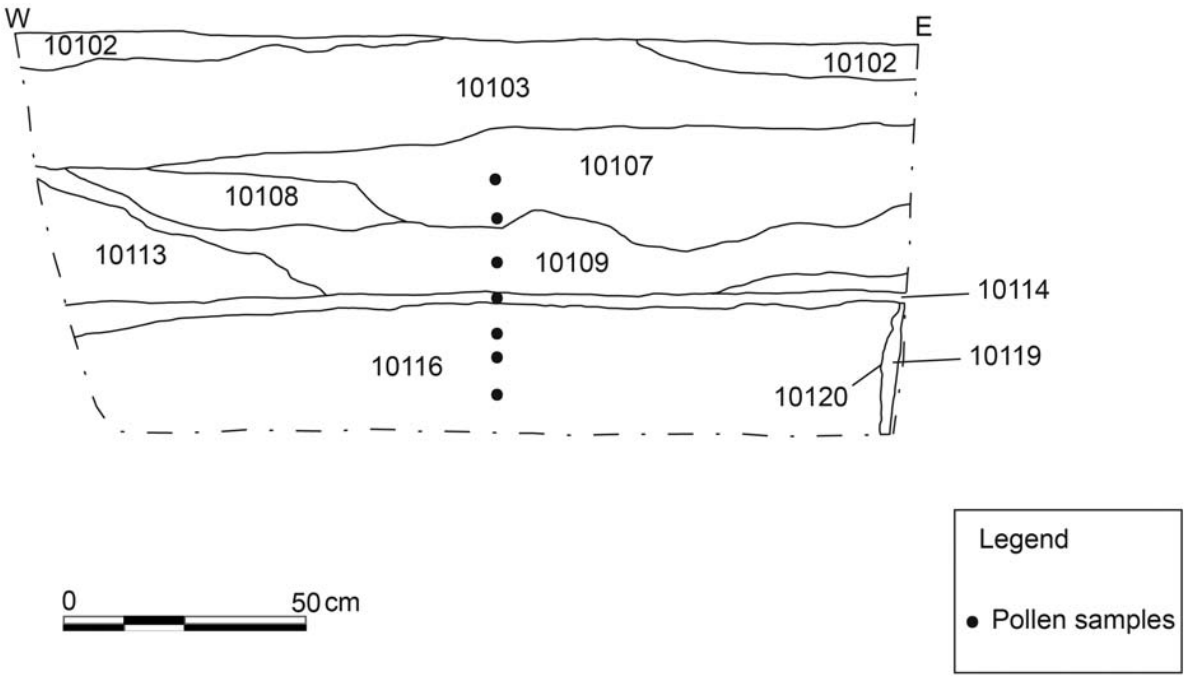


Fig. 10.21 Marzuolo, N section, Trench 3, including location of pollen samples (ERZ/MS).

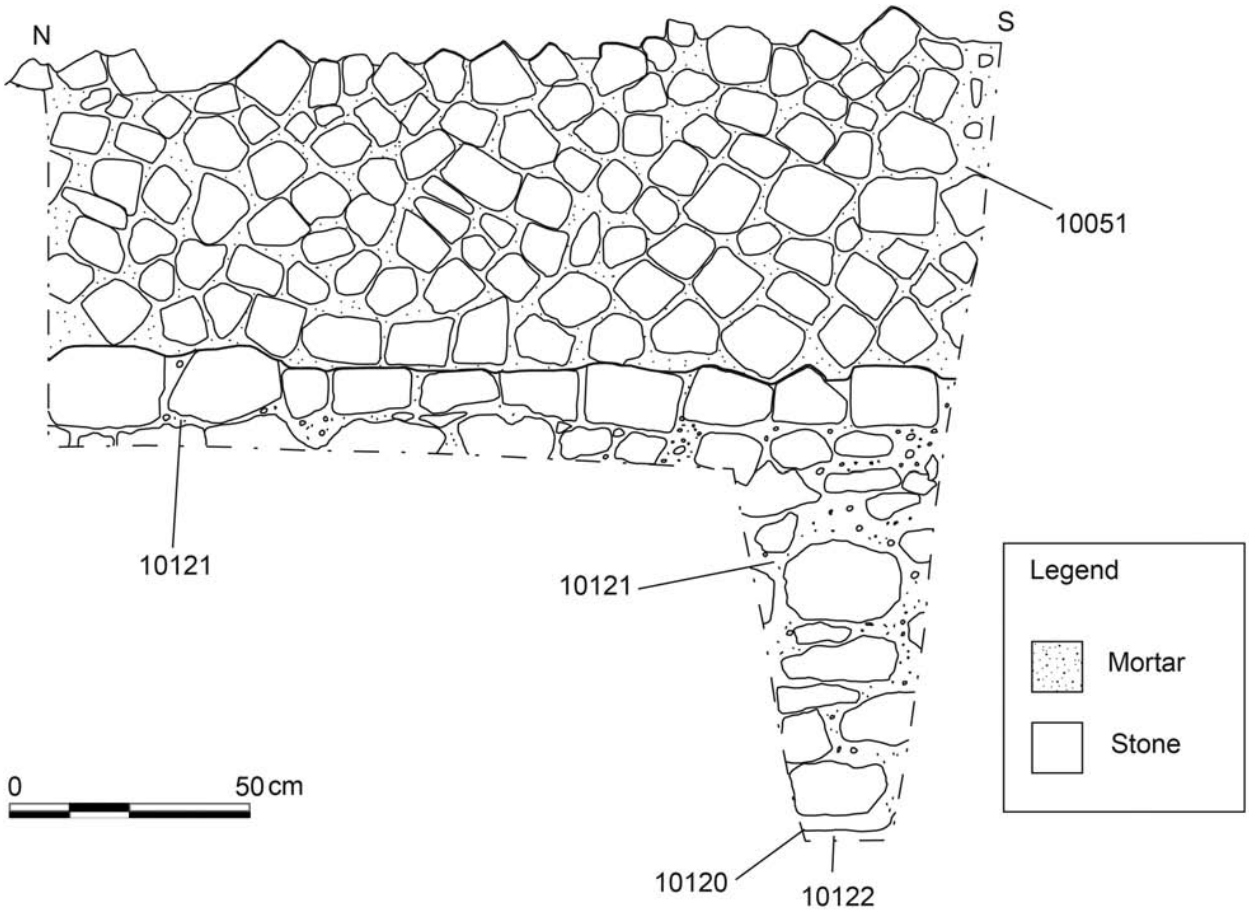


Fig. 10.22 Marzuolo, E section, Trench 3 (ERZ/MS).

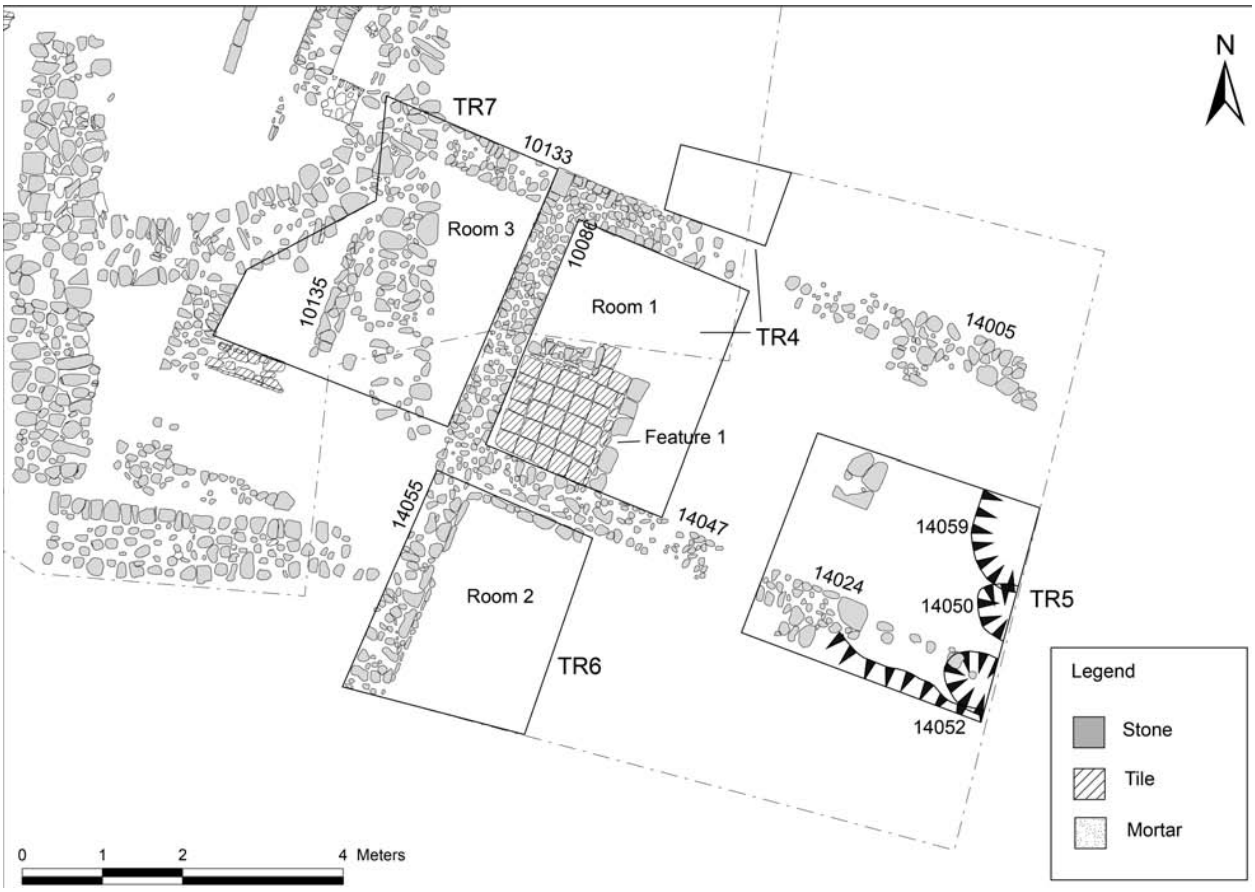


Fig. 10.23 Marzuolo, plan, Trenches 4–7 (ERZ/MS).

which was cut a small feature (Feature 1) (Figs. 10.26 and 10.27). This rectangular feature was bounded by two narrow masonry walls (SU 14019 and 14020) between which a gap lined with a floor of tiles. Adjacent to wall SU 10086, two tiles were laid atop this floor. Immediately to the north of this feature, a drain (SU 14045) was found set into the *opus reticulatum* wall SU 10086. The drain was formed of two *imbrices* but, somewhat strangely, it did not drain into Feature 1 with its tile floor (Figs. 10.27 and 10.28).

A small sondage to the north of Room 1 revealed a deep cut in the northern portion of SU 10086. This cut and subsequent fill (SU 14023) ran NNW/SSW and seems to have taken place prior to the infilling in that room. Its orientation is similar to that found in the S wall (SU 14047) of Room 1 (see below).

Trench 5 (Fig. 10.29): Further excavations at the eastern limit of Room 1 revealed the door of that room, a wide opening spanning the whole width of that room, interrupted by a single pier (SU 14033). The southern wall (SU 14024=14047) projected slightly past the door, forming a kind of buttress, while the western continuation of that wall showed signs of damage—indeed, a cut (SU 14073) at the same orientation (NNW/SSE) to that found in wall SU 10086 (see above Trench 4) and probably a continuation of it. The cut was visible in section as a robber trench.

The stratigraphy in this eastern part of Room 1 was dominated by the same thick fill as the western areas—a mixed fill, set directly atop the chocolate-brown clay (here SU 14049) (Fig. 10.30). Cut into this clay found was cut a series of pits (SU 14050, 14052, 14059).

Trench 6 (Fig. 10.31): Excavation to the S revealed a second room (Room 2), partially excavated, whose stratigraphy echoed that of Room 1. The room was bounded to the N by SU 14047, which it shared with Room 1, and to the W by wall SU 14055. The trench was not excavated sufficiently to the E or S to find those wall limits. Again, a thick infill level (SU

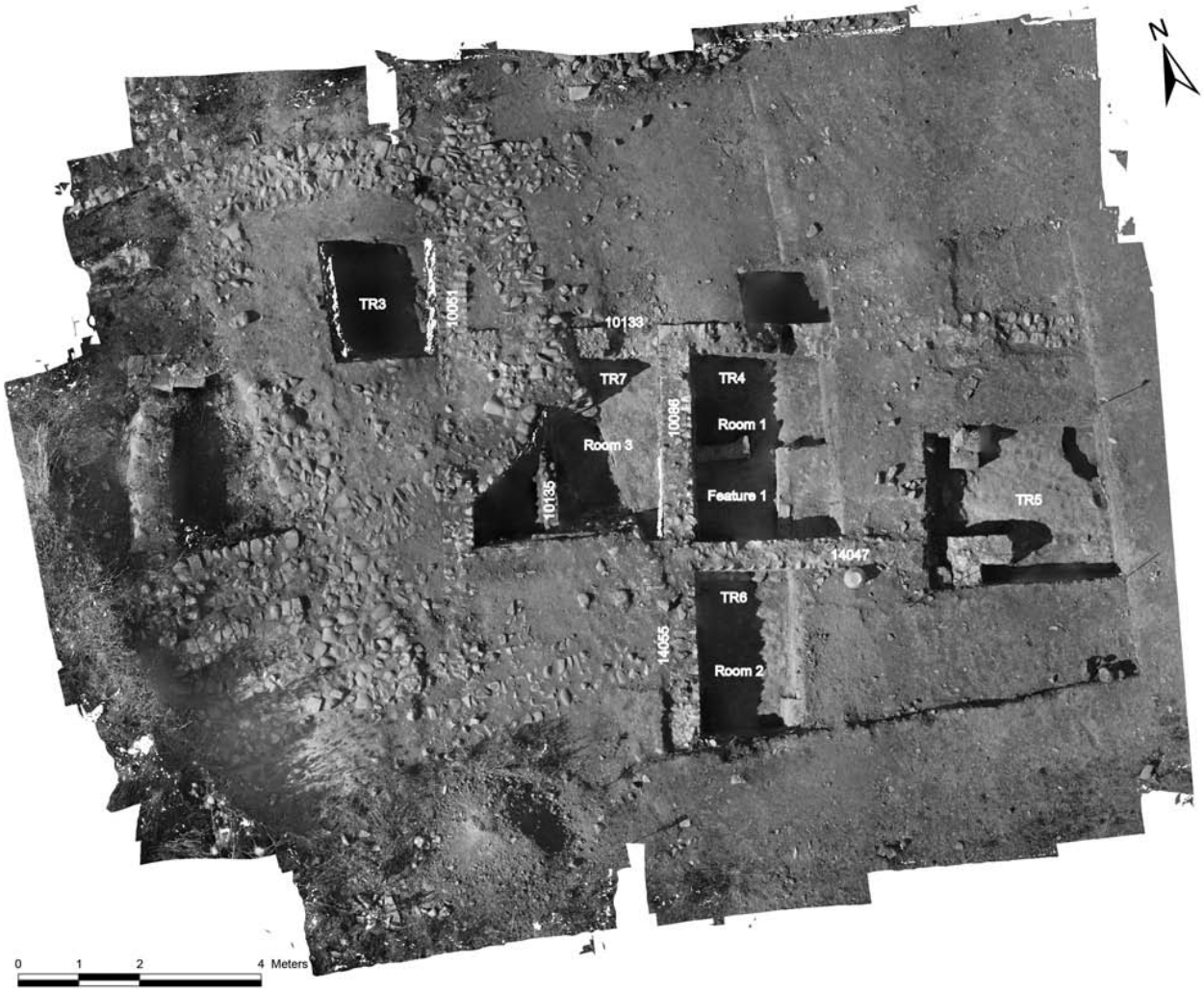


Fig. 10.24 Marzuolo, orthophoto of Trenches 4–7 (MS).

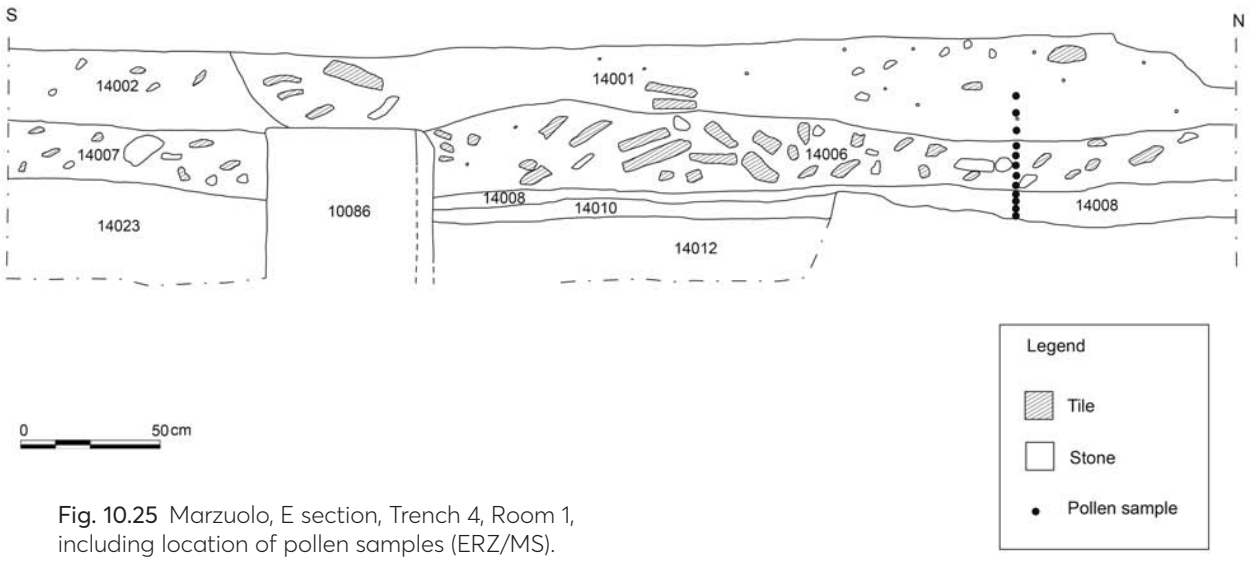


Fig. 10.25 Marzuolo, E section, Trench 4, Room 1, including location of pollen samples (ERZ/MS).

Fig. 10.26 Mazuolo, view, Room 1, Feature 1.

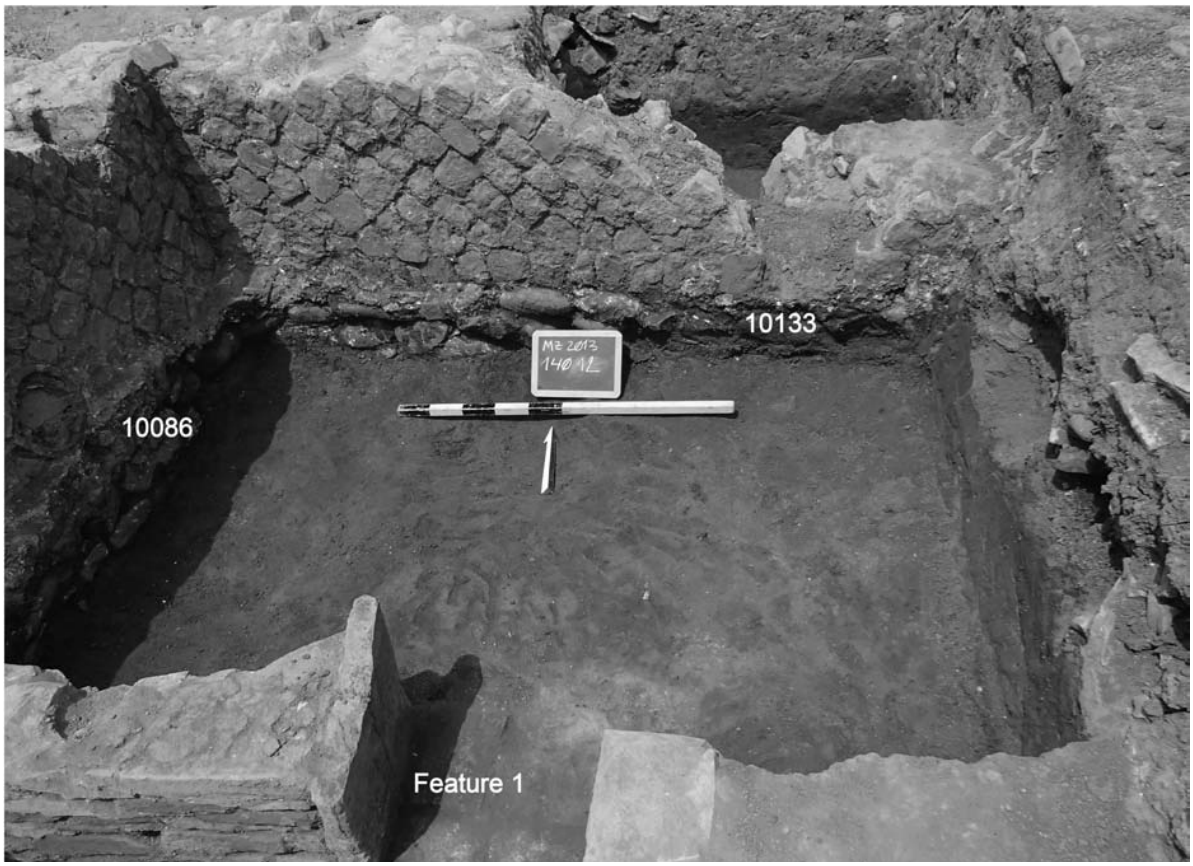


Fig. 10.27 Marzuolo, view, Room 1, from S, after removal of Feature 1.

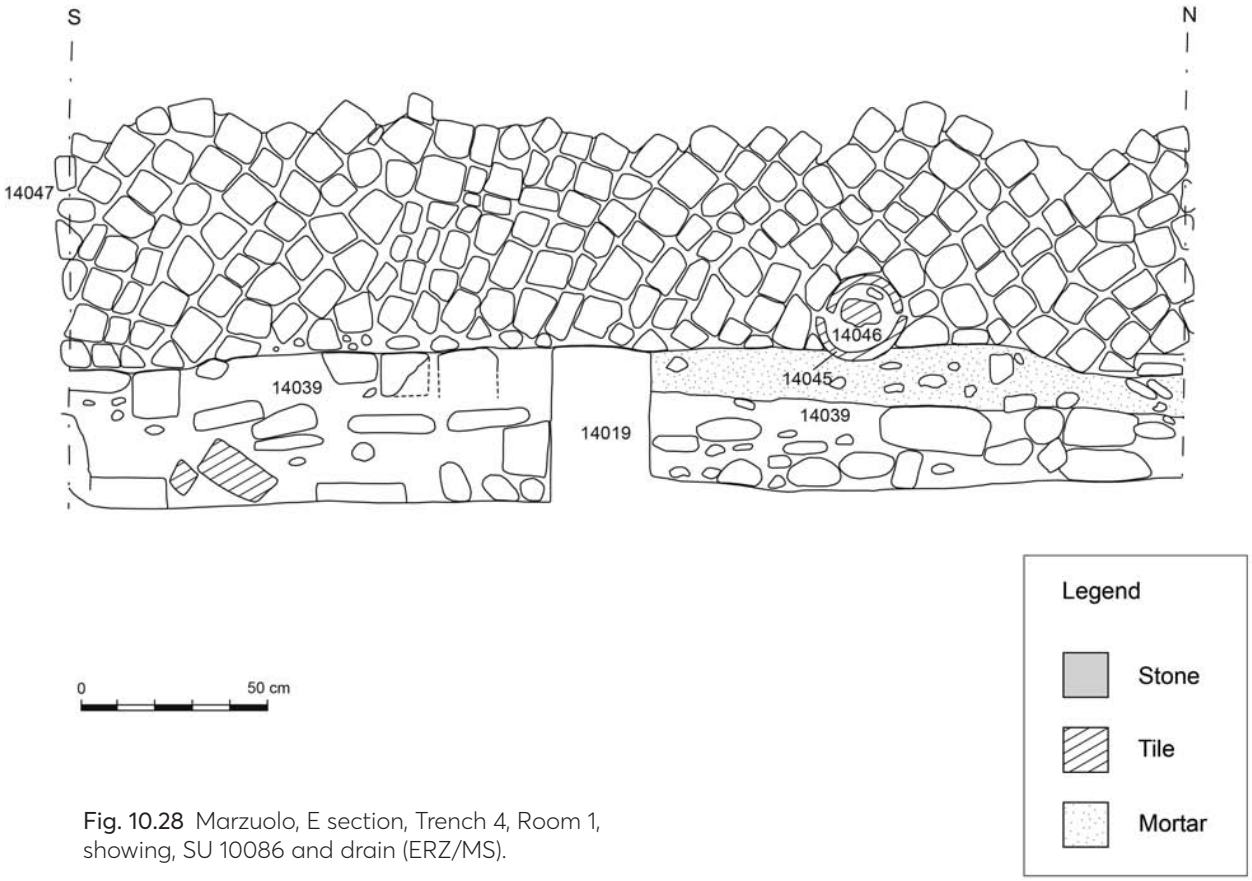


Fig. 10.28 Marzuolo, E section, Trench 4, Room 1, showing, SU 10086 and drain (ERZ/MS).

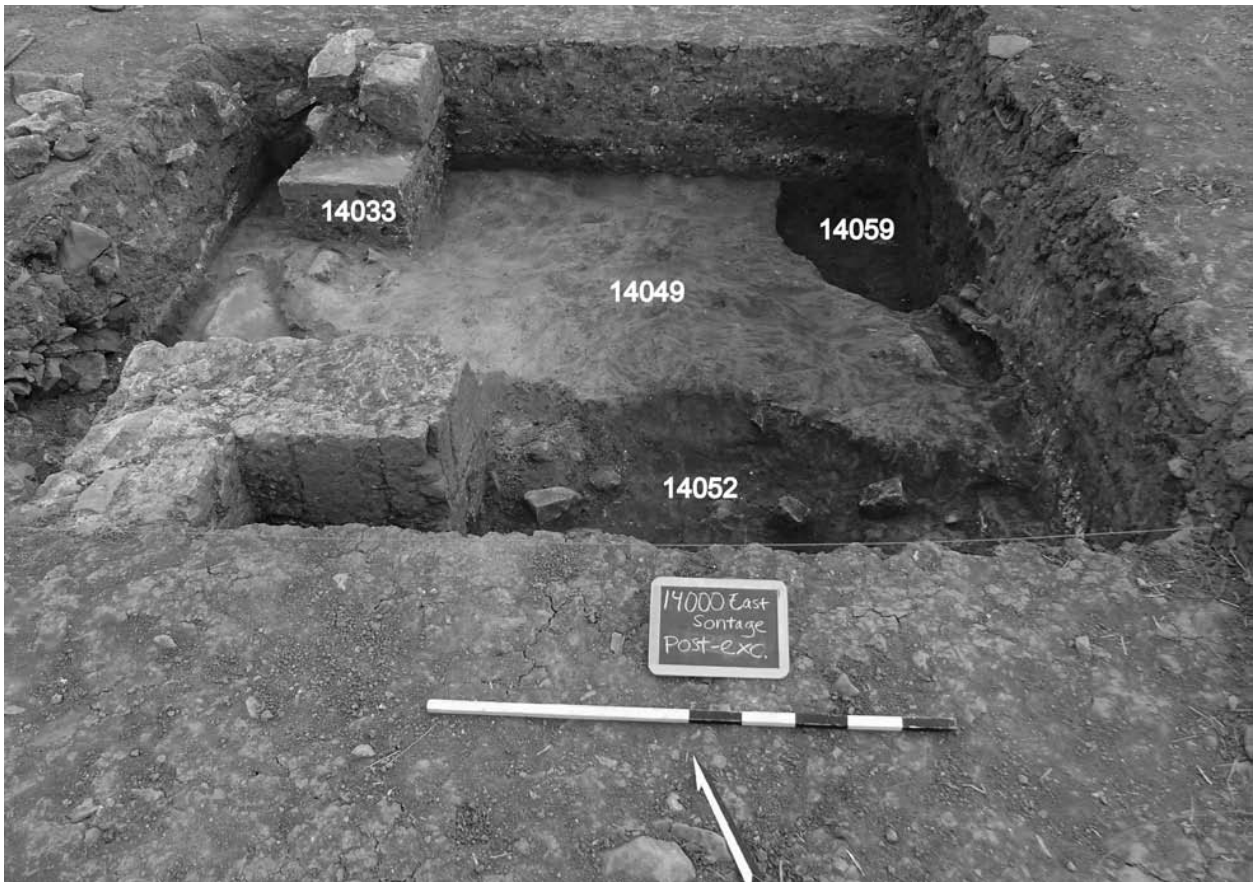


Fig. 10.29 Marzuolo, view from S, Trench 5, Room 1.

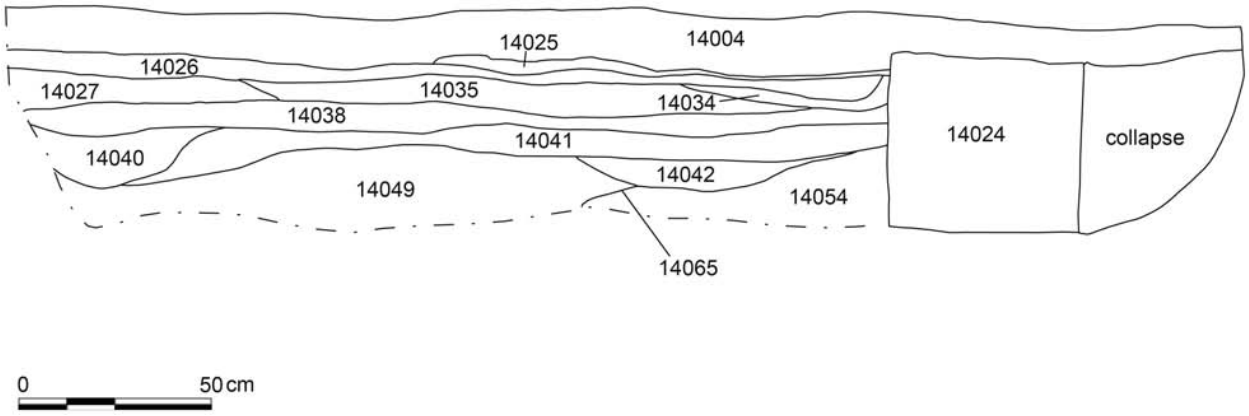


Fig. 10.30 Marzuolo, S section, Trench 5 (ERZ/MS)

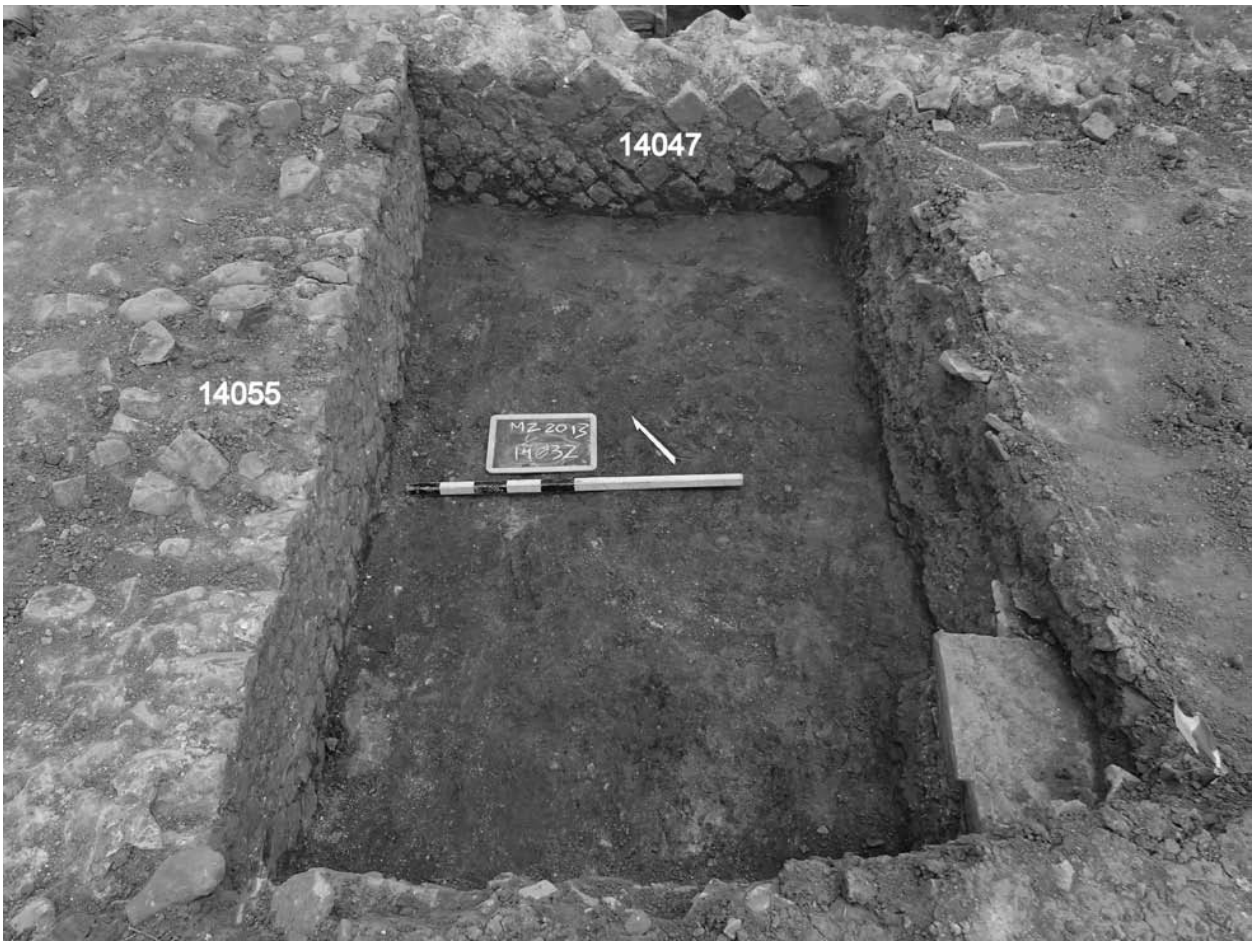


Fig. 10.31 Marzuolo, view from S, Trench 6, Room 2.

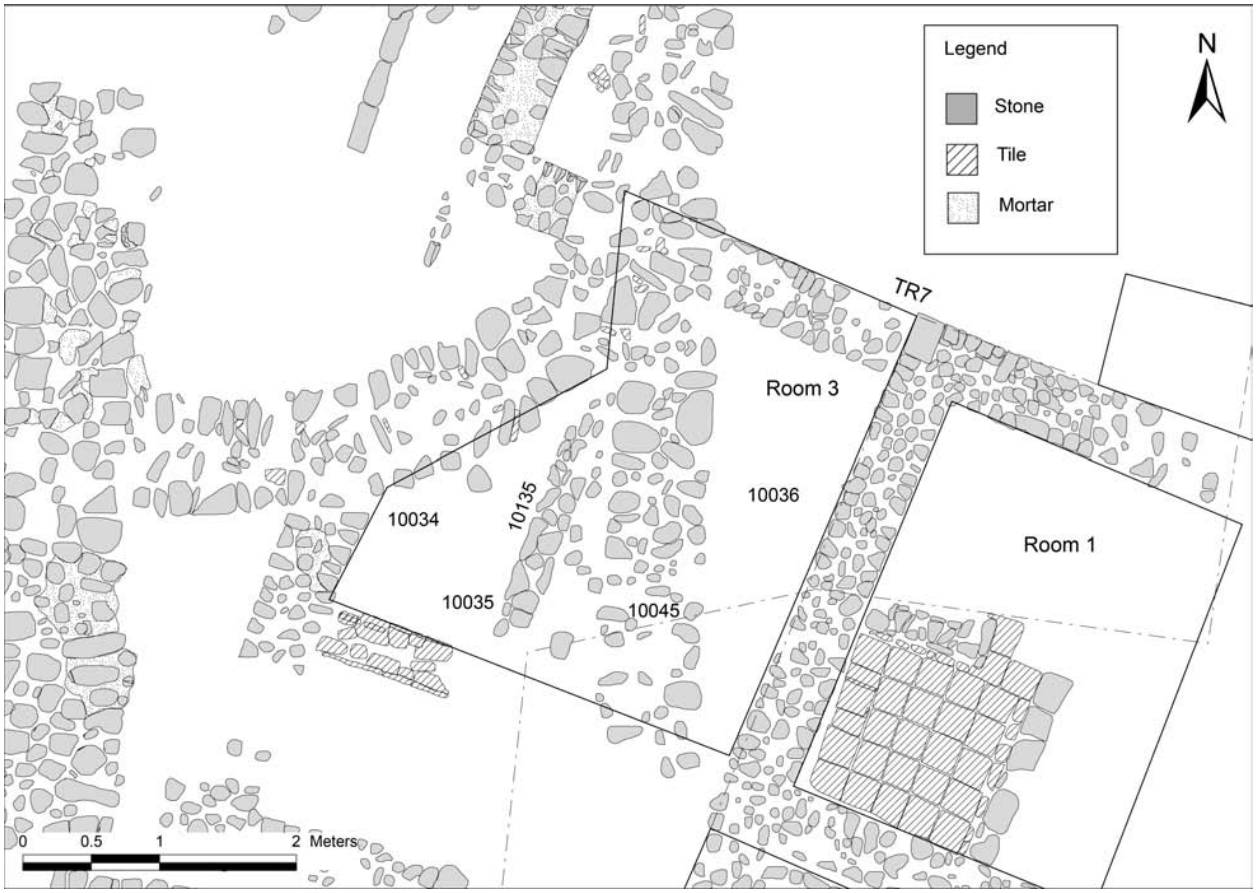


Fig. 10.32 Marzuolo, plan, Trench 7, Room 3 (ERZ/MS).

14013–14017), some of which included heavy concentrations of tile, overlay a series of shallow pits (SU 14031, 14056, and 14058). Atop these and immediately beneath the collapse/backfill lay the same chocolatey clay level (here SU 14032) found elsewhere, which commenced, as elsewhere, at the top of the *opus reticulatum* foundations. Again, no floors of any kind were found.

Trench 7 (Fig. 10.32): Excavation to the W of Room 1 removed part of the eastern church wall and exposed a third room (Room 3) to the W of Room 1. Although much of the Trench was dominated by the church remains and large cuts associated with the deep church walls, portions remained with intact Roman stratigraphy. The excavations revealed a space bounded by walls SU 10133, 10086, 14047, and 10050, all in *opus reticulatum*. The pipe that emerged in Room 1 originated in this room, running through wall SU 10086. However, no floors or other features were discovered relating to the use of this drain or this room.

Room 3 was also was bisected by a narrow partition wall (SU 10131) in rubble. This partition was cut into the same chocolate clay layer (here SU 10134) as the rest of the *opus reticulatum* building. It was abutted by a ceramic-rich set of tips (SU 10129, 10130, 10132), seemingly rubbish, whose date is dramatically different from the backfill contexts found elsewhere in the *opus reticulatum* building (Fig. 10.33). These were the only contexts found that may be associated with the construction/use of the building and that contained datable materials (see chronology below).

These excavations also revealed the north and south faces of *opus reticulatum* wall SU 10133. Interestingly, the south face had no *opus reticulatum* facing, while the north did. It is possible that the wall was never completed.

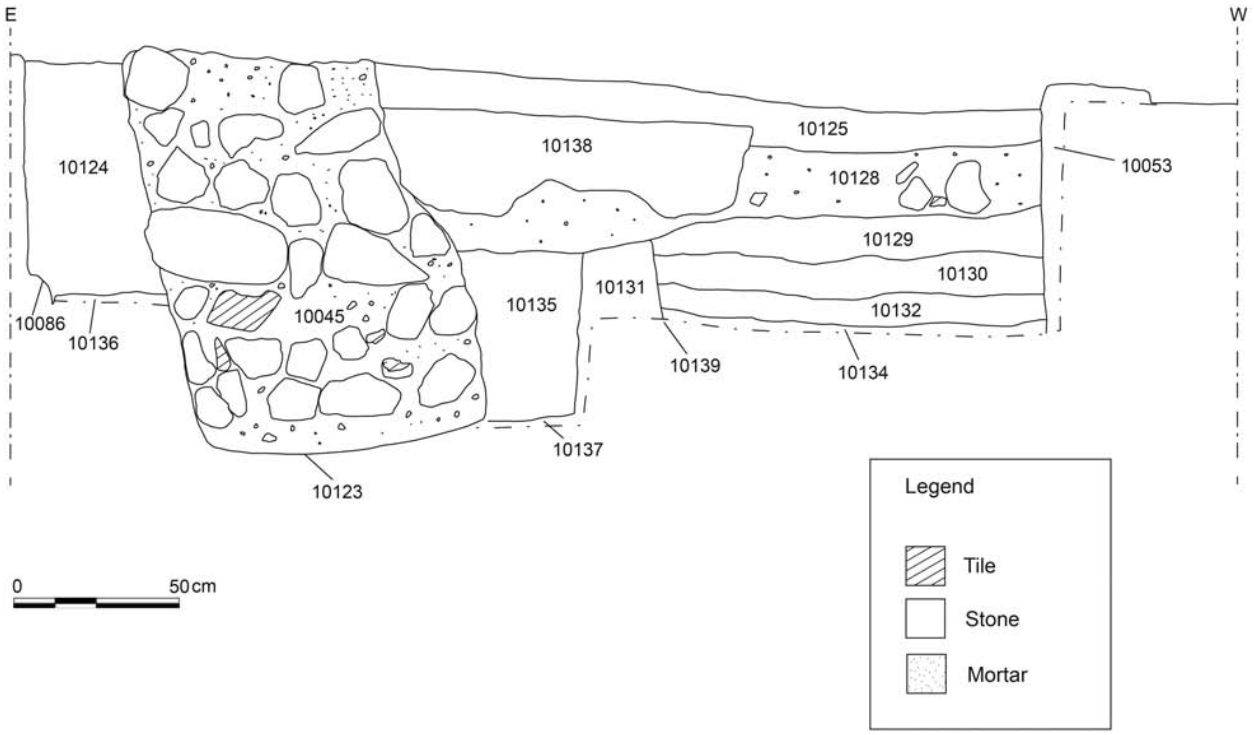


Fig. 10.33 Marzuolo, S section, Trench 7, Room 3 (ERZ/MS).

Area I chronology

Area I displays four major moments of use (Table 10.1): the possible construction of the *opus reticulatum* building in the mid-late Augustan period (Phase 1); the use and abandonment of the ceramics production center to the N ca. 50–70 AD (Phase 2), the backfilling of the site, accompanied by possible plowing in the 2nd to early 3rd c. AD (Phase 3); and the construction of the medieval(?) church (Phase 4).

Phase 1: The construction date of the *opus reticulatum* building (Structure 2) is given by two contexts only, and remains uncertain and could instead belong to Phase 2. Two leveling tips, laid up against the rubble dividing wall SU 10131 in Room 3, were the only preserved contexts related to the building's construction and/or use. In the stratigraphically earlier of the two, SU 10130, the Italic sigillata and Experimental sigillata records both seem to point to an Augustan date for this assemblage, possibly around the mid-Augustan period. Two Experimental sigillata vessels with the same fabric and shapes as those manufactured at Marzuolo, Area III, are documented, along with Italic sigillata (variant of the bowl Conspectus 8, plate Conspectus 7) whose stamps indicate a mid- to the late Augustan date.

Stratigraphic Unit 10129, whose date should be in the first half of the 1st c. AD, covers SU 10130. Two band-shaped table jugs in coarse ware are typical in other Julio-Claudian contexts excavated by the project, while two cooking pots with everted rim are very similar to types documented in the early to late Augustan contexts of Area III and also find parallels with a 1st c. AD cooking pot type from the nearby villa at Santa Marta (Vaccaro pers. comm.). The only two Italic sigillata vessels point to a Julio-Claudian date, with a Conspectus 34.1 cup of a more precise Tiberian to Claudian date.

Against an Augustan date are the small quantities of these assemblages, the presence among them of a fragment of a broad-rimmed glass bowl or modiolus which appears to be Neronian/Flavian (see Glass below), plus the fact that the 50–70 AD production phases directly abut the *opus reticulatum* structure on its W side and lie directly atop the leveling layer upon which it is built. The absence of true *opus reticulatum* architecture in this region until the Julio-Claudian period more tentatively points to later date, but so-called *quasi reticulatum* at Roselle from the 1st c. BC may indicate a somewhat earlier advent (cf. Nicosia and Poggesi

Table 10.1 Marzuolo, Area I, major excavated contexts with diagnostic ceramics/dates (EV).

Context	Chronological Information: Pottery	Total MNI	Possible date	Reliability
Phase 1				
10130	CW olpe (1 MNI); handled jar (1 MNI); table amphora (2 MNI); CCW: bowl (1 MNI); Experimental sigillata: bowl Consp 8 variant; cup Consp. 38; Italic sigillata: dish Consp. variant 8 (2 MNI); bowl Consp. 14 (2 MNI); plate Consp. 7; KW pot (5 MNI); Thin Wall pot.	22	Early to mid? Augustan	Medium: context date correct, stratigraphic significance less so as backfill for a subsidiary wall in Structure 1
10129	CW jug (4 MNI), CW table jar; Italic sigillata: jug Consp. K16 (1 MNI); cup Conspectus 34.1 (1 MNI); KW: pot everted rim (2 MNI); pot flat base (1 MNI) Thin Walls pot (1 MNI).	12	First half of the 1st AD	Medium: Low dated MNI; context date correct, stratigraphic significance less so as backfill for a subsidiary wall in Structure 1; covers SU 10030
Phase 2				
10093	250 MNI of Italic sigillata vessels of late production. 171 vessels bear the in planta pedis stamp: MANNE (82 MNI), MN (59), A.MN (5 MNI), A.M.VR (3 MNI), L.HVM.H. (22 MNI); only 1 MNI has the framed stamp T.RVFR. Forms include: Dish Conspectus 3 with variants (46 MNI); Platter or plate Conspectus 4 with variants (44 MNI); Platter or plate Conspectus 21 with variants (12 MNI); Platter or plate Conspectus 20 with variants (23 MNI); Small cup Conspectus 34 (44 MNI); Larger cup Conspectus 34 (30 MNI); Cup Pucci XXIX (30 MNI); Chalice Conspectus R 9.2.1 (7 MNI); Other chalices (4 MNI); Non-stamped pyxides (5 MNI); Non-stamped lids for pyxides (5 MNI).	250	50–70 AD	Good: single cache of Italic sigillata of late production in firing stacks
10085	Amphorae: flat bottom local/regional (3MNI); Camulodunum 184; CW: double handled jug (1 MNI); table jugs (2MNI); handled jug (1 MNI); table pot (1 MNI); CCW: double handled pot (1 MNI); Italic sigillata: cup Consp. 34 (1 MNI); cup Consp. 38 (1 MNI); KW: pots (3 MNI); *tegame*; Thin Wall pot (1 MNI).	20	50–70 AD	Medium: little FW to date context
10055	Amphorae: Dressel 9; Italic sigillata: dish Consp. 4.4; cup Consp. 26; dish Consp. 21.2 or 3?; cup Consp; dish Consp. 6; lamp: Bailey C, Groups I and II 27.1.2.	10	50–70 AD	Good
10082	CCW: table jar (2 MNI); Italic sigillata: cup Consp. 38 (1 MNI); dish Consp. 20 (1 MNI); dish Consp: 11 (1 MNI); dish Consp. 3.3 (1 MNI); KW *tegame* w everted rim.	9	50–70 AD	Medium: small Italic sigillata MNI
Phase 3				
14001	VRI *tegame* (1 MNI); ARS A bowl; Thin Walls jug; KW: Tunisian from Hayes 23B (1 MNI); pot w double stepped rim (1 MNI); CW: jug (1 MNI); Amphora: Dressel 14 Lusitanian (1 MNI); residuals: Italic sigillata dish Consp. 3; early local/regional amphora.	10	late 2nd–early 3rd c.	Good
14004	Amphora: Leptiminus 1C1 (1 MNI); Dressel 14 Baetican (2 MNI); KW *tegame* (2 MNI); VRI *tegame* (1 MNI); Italic sigillata Consp. 3.2 (1 MNI); dish Cons[. 3.3 (1 MNI); cup Consp. 14 (1 MNI) (residual).	11	2nd–early 3rd c.	Good although broad date; absence of ARS significant; one residual piece

Table 10.1 cont'd Marzuolo, Area I, major excavated contexts with diagnostic ceramics/dates (EV).

Context	Chronological Information: Pottery	Total MNI	Possible date	Reliability
14006	Amphorae: Dressel 14 Baetican (4 MNI); local/ regional; CW jug (1 MNI); KW pot (1 MNI); bowl (1 MNI); lamps: Firmalampe type; Italic type; ARS dish Hayes 6B; CCW jug (2 MNI); VRI *tegame* (1 MNI).	20	2nd–3rd C.	Good: although broad date
14037	Late Italica sigillata: dish Consp. 3; Amphora: Knossos 19.	2	Flavian-Antoninian	Poor: low MNI; presence of Knossos amphora and late sigillata provide more precise date
14038	Italic sigillata: cup Consp. 34 (1 MNI); Thin walls beaker (1 MNI); KW pot with everted rim (1 MNI).	6	Flavian-Antoninian	Medium: low MNI; dated also in correspondence with associated SU 14037

1998:195, 203). Recent excavations have tended to support the early date (Van Oyen and Vennarucci 2016, 2017), but until their results are published in full the question should remain an open one.

Phase 2: The production area to the N (Trenches 1–3) produced a consistent collection of ceramics datable to a generation later, 50–70 AD. These included the Italic sigillata manufactured at the site (cf. SU 10093), as well as Italic sigillata brought in from outside, the amphorae dumps and associated coarse and cooking wares.

The Italic sigillata from SU 10093, the large cache of ceramics still in stacked order from firing, included stacks of Conspectus 3 dishes, Conspectus 4 platters, two different modules of Conspectus 34 flanged cups, carinated cups of type Pucci XXIX (all of the same shape although varying in size), Conspectus 20 and Conspectus 21 platters. All may be securely dated to ca. 50–70 AD.

The hearth area (SU 10055) to the W of this ceramic cache likewise yielded some of the same Italic sigillata vessels (forms Conspectus 4, 21, and 26) manufactured at the site in 50–70 AD. The amphorae dump to the E represented a wide geographic spectrum of forms, from a large number of local flat-bottomed amphorae of various kinds to Spanish and Asia Minor examples. The dates of both the amphorae and the associated Italic sigillata, coarse ware and cooking pots from these contexts again point to a moment in the mid-1st c. AD, around 50–70 AD.

Phase 3: The whole of the *opus reticulatum* building (Structure 2) seems to have been deliberately backfilled in a single moment sometime in the 2nd to early 3rd c. AD. The upper level contexts from Rooms 1, 2, and 3 all yielded significant quantities of African red slip, African cooking wares and, above all, Dressel 14 (Baetican and Portuguese examples), with virtually no residual materials aside from a few sherds of ceramic and five Republican/Augustan coins (see below). The largest, most stratigraphically reliable contexts (SU 14001 and 14006) may suggest a more precise moment in the late 2nd to early 3rd c. through the presence of African red slip, a dish Hayes 6B, and Firmalampen of possible Padanian origin.

Two trenches that cut the *opus reticulatum* (SU 14073 and 14023) suggest possible plowing or wall robbing in the area, although the chronology of these is unclear.

Phase 4: The construction date of the church is made complicated by the non-correspondence between its plan and the ceramics found inside it. A small group of late 11th to 12th c. ceramics from contexts (SU 10001/10003) point to a date in the high medieval period. The plan, however, with its embedded eastern apse and flanking square pastophoria is undocumented in 11th to 13th c. Tuscan church architecture. The rural churches in Grosetto area are often simple rectangles or a single nave with apse (Marrucchi 2014). In neighboring regions of Valdelsa, Val di Cecina, and Chianti, more complex three-aisled plans with three apses may also be found, but none resemble the Marzuolo church (Moretti and Stopani 1966, 1968, 1970; Campana et al. 2008). The plan is relatively more common, however,

in late antique and early medieval architecture, as for instance among the rural churches in northern Italy, near Ravenna/Aquilea, Piemonte, or Alto Aldige (Cagnana 2003; Pejrani Baricco 2003; Nothdurfter 2003:204–206). No late antique or early medieval material of any kind was found to support such a date, although, as noted above, the church was not excavated to any depth.

Area I Discussion

The excavations in Area I were complicated both by the presence of the later church and of the thick, mixed levels of oxidized earth, charcoals and debris which at first seemed to represent separate activity moments, while when viewed in section, particularly in Trench 3, emerged as a thick, consistent set of use levels, followed by a moment of collapse represented by SU 10020.

The northern part of Area I (Trenches 1–3) was clearly dominated by the remains of a ceramic production center: the thick contexts of oxidized red earth and clear lens of charcoal are only to be found here, as well as the rich cache of recently fired Italic sigillata. These contexts clearly abut Structure 2, the *opus reticulatum* building, which seems to mark their limit—no such contexts associated with production were found within or beneath this structure. Thus, it would seem that Area I contained two distinct zones, a production area to the N and the *opus reticulatum* building to the S and E.

The production center was dominated by contexts rich in oxidized earth, light, vitreous slag, and various burning levels, all set atop a thin context of dark, consistent charcoal (SU 10085, 10071, 10014). In Trench 1 and 2, seemingly atop or set just into these levels were found alignments of rough-fired terracotta bricks. While occasionally mortar was found clinging to these bricks, this was rare and sparse. Their V-shaped section and in Trench 2, their V-shaped alignment, suggested their use in vaulting.

The interpretation of both the stratigraphy relating to various and distinct moments of burning and the subsequent collapse of what appear to be vaults was complicated by the difficulty of distinguishing individual burned contexts and locating any other remains of the collapsed structure. Two principal interpretive frameworks are possible. Hypothesis I: the whole of these burned contexts and possibly the bricks represent the collapse of a large structure which covered more or part of Area I. The burn levels are, thus, the product of a massive conflagration of this structure. The kilns, in this hypothesis would have been located next to this structure, to the N or E, but were never found nor have they been found in the more recent excavations (Van Oyen and Vennarucci 2016, 2017). Hypothesis II: The burn levels, particularly the slag-rich contexts in Trenches 1 and 2, and the charcoal lens found throughout, relate to the use, not collapse, of these same large kilns. The bricks represented the disturbed remains of the vaults of those kilns, whose walls were never encountered. The kiln in Trench 2 lies beneath the church, while that in Trench 1 has been disturbed and probably lies to the N or beneath the church.

The members of the team disagree which interpretation is to be preferred. In favor of Hypothesis I is the absence of any kiln walls and the strong impression—given by the cache of intact, albeit misfired vessels in SU 10093—of a sudden catastrophic end to the site which accounts for the thick levels of debris. How the slag becomes mixed into these collapse levels, the placement of the ceramic cache directly in, rather than below them, and the difficulties of reconstructing a major vaulted building with no known supporting walls all complicate this theory. In favor of Hypothesis II, the thin, regular band of burning is inconsistent with a building collapse but more consistent with use for firing; the very deep (0.5 m) oxidized contexts in the immediate vicinity of these possible kilns, and the clearly in situ alignments of the V-shaped bricks in Trench 2. The fact that the pollen in Trench 3 was entirely incinerated, plus the high levels of bone calcination in many of the samples from this area all similarly point to repeated, high temperature fires—like that produced by kilns—rather than a single destruction moment. Regardless of interpretation, the northern part of Area I can be clearly identified as a production zone for Italic sigillata in use at least from ca. 50–70 AD.

The recent excavations carried out by Van Oyen and Vennarucci do not wholly resolve the issue. Their work to the N of Area I's N limit has revealed a line of rooms, seemingly workshops, including tanks possibly used in wine production (Van Oyen, pers. comm.) and successively a blacksmith's work area (Fig. 10.34). The kilns are clearly not, therefore, to be

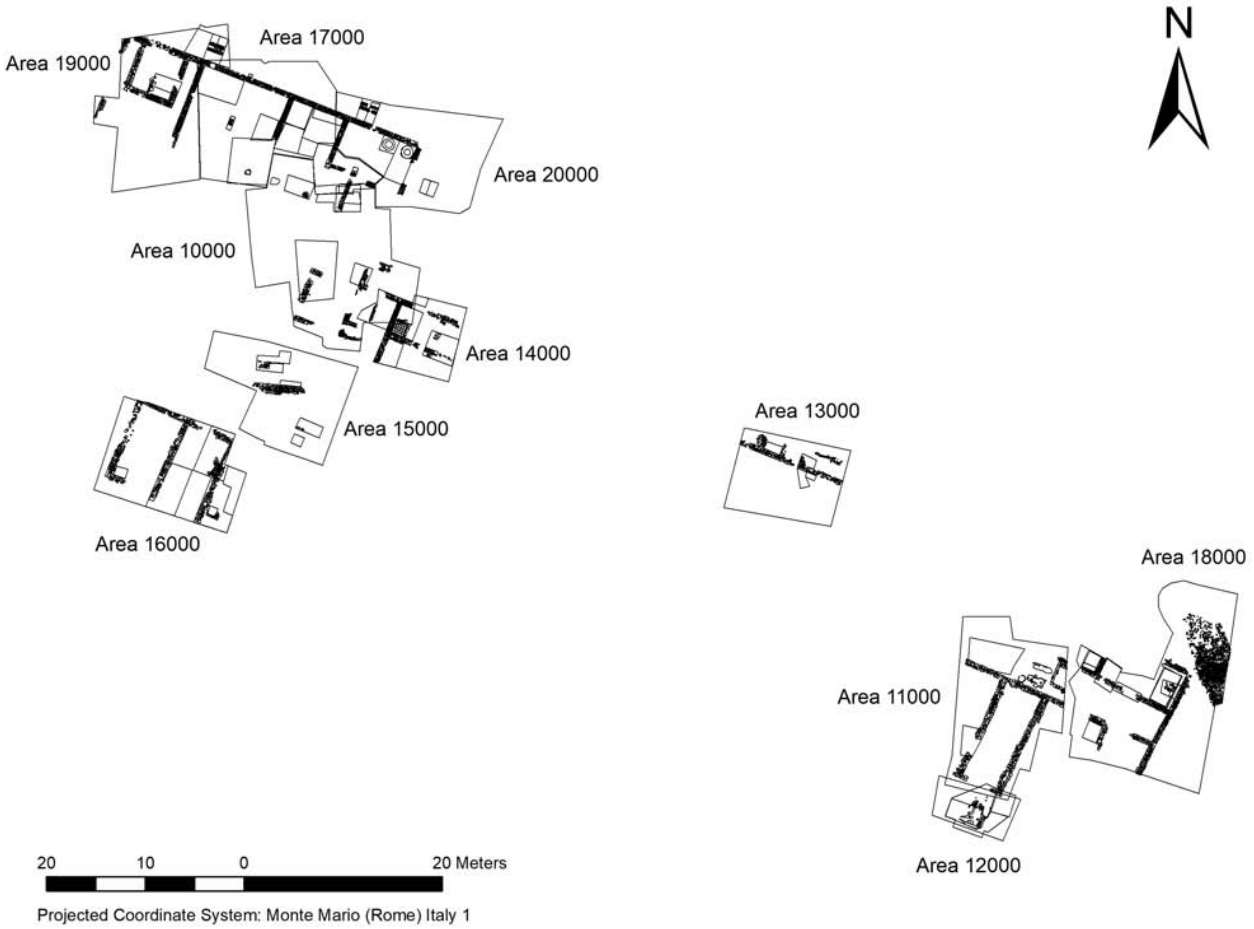


Fig. 10.34 Marzuolo, plan of Van Oyen and Vennarucci excavations, 2018 (by kind permission of Astrid Van Oyen and Rhodora Vennarucci).

found to the N. The circular column and pier from our excavations align with a similar pier arrangements in theirs—all pointing to a kind of porch fronting this building, one which might have continued around the W side of the *opus reticulatum* building in the form of SU 10046. Thus arranged, with workshops opening to the S and the *opus reticulatum* building to the E, the kilns would most likely lie in the western portions of Area I and largely below the rest of the church.

It is fascinating, as Kenrick has remarked, that so few Italian sigillata production sites preserve evidence of their kilns: the kiln-lacuna at Marzuolo may be resolved by further excavation, but the problem is a common one (Kenrick 2006:203). Were the levels encountered in Trenches 1–3 part of the kilns themselves, these contexts may be tentatively used to reconstruct them. As noted above, no signs of the kiln walls were found and, thus, any reconstruction cannot yet describe the kiln form, only the general size and morphology. The large underfired or sun-baked bricks likely belong to arches or vaults; their configuration suggests the latter and would be part of the collapsed superstructure of the kiln or vaulted substructures used to support the kiln floor. These finds as well as the thick (0.5 m) levels oxidized levels are located in an approximately 10 x 10 m area in the western parts of Area while the recent excavations have reported the same continuing to the SE. The total area of possible kiln debris measured at least 15 x 10 m if not larger. The size of the Phase 2 kilns, whatever their form, would have been relatively large, at least as large as the 4.5 m^2 and 3.6 x 6 m kilns at Torrita di Siena (Pucci 1992).

Set amongst the ceramic production activities and contemporaneous with it were two other activities: the storage of a large number of transport amphorae and at least one cooking hearth. While the stratigraphic position of these installations vis-à-vis the many burned and oxidized contexts was unclear, the chronology of the amphorae themselves and the ceramics found in the hearth were all identical with that of the ceramics cache of SU 10093 (50–70 AD) and all were covered by the mixed collapse represented by SU 10020.

Thus, while the architectural form of this northern area remains unclear, with fair certainty we can reconstruct a series of kilns for the production of Italic sigillata, an amphorae storage area, and possibly sheltered areas for cooking.

To the S of this area lay the *opus reticulatum* building. This seems to have preceded the excavated phases of use in the production area, although by how much time is difficult to say: the fact that in Trench 3 the charcoal lens SU 10114 lies directly atop the chocolaty-brown layer that formed the base for the *opus reticulatum* building would indicate a close temporal correspondence between the two events. The significant temporal divide between the few contexts (SU 10129, 10130) associated with the *opus reticulatum* building's construction and the use and the phases of the production area (see above), would indicate a longer gap. That being said, both sets of evidence are sparse: only one small context currently dates the building, while in the northern production area, any lower levels beneath the 50–70 AD uses phase were never excavated.

The function of the *opus reticulatum* building was not ascertained. No floors were found, while Feature 1 was the only specific installation found within the building and its function is unclear. The tiled area, bounded by two small walls with a water pipe adjacent, present some parallels with a hypothesized "puddling pit" found at an Itchingfield, England tile workshop (Green 1979). Washing the raw clay with water to remove impurities, mixing it with additives and pounding to remove air could all have taken place in this space. Van Oyen and Vennarucci's discovery of possible wine production in the N wing of the building may indicate instead agricultural functions, like a press apparatus. While the use of *opus reticulatum* in this area is restricted to cities and to elite structures, on the whole, Feature 1 and its adjacent wall drain, the large door to Room 1, and the absence of any decorative elements all seem to point to industrial, versus domestic use, although the discovery of some stone tesserae (see below, Small Finds) from a mosaic and window glass (see below, Glass) may suggest domestic areas nearby. It is also possible that the building was never completed: the one unfinished *opus reticulatum* face (SU 10113), the absence of floors, and the absence of any collapsed upper walls or roof or their materials might point in this direction. However, like the actual or intended function of the building, this possibility lacks sufficient supporting proof.

10.3.2 Area II

Area II lay some 30 m to the E of Area I (Figs. 10.35 and 10.36). A 10 x 8 m area was excavated in 2013 to test the extension of the planned site and to locate any evidence for habitations. Remains were encountered immediately beneath the plow soil and very little preserved stratigraphy was found.

A long NE/SW wall (SU 13007/13011) was found paralleling the alignment on the rest of the site. This was constructed of unworked limestone bonded with mortar, much like the walls from Area III immediately to the E, although of better quality with two good faces. To the S of this wall and abutting it lay a cobbled surface (SU 13009/13010). The size and uninterrupted nature of this surface suggested an open courtyard, onto which buildings opened from the N. Despite the lack of a clear enclosed area, the complex was labeled Structure 3.

Of the northern structures, very little remained owing to extensive plow damage. Only one wall (SU 13019) could be discerned as a possible interior dividing wall, intersecting SU 13007/13011 at a right angle. It was preserved to one course of river cobbles and bonded with a white sandy mortar. Its foundation trench (SU 13029) cut the same dark brown "chocolate" deposit (SU 13020) as the foundation trench (SU 13028) of wall (SU 13007/13011).

Through the cobble surface ran a long cut (SU 13013), which ultimately also cut wall SU 13007/13011. A sondage through this cut also revealed that a low wall or drain (SU 13025) was inserted into this cut, some 0.40 m below the level of the cobble surface. It should be noted that the orientation of the cut, NNW by SSE, more or less parallels the cuts through the walls in Area I, Trenches 4 and 5.

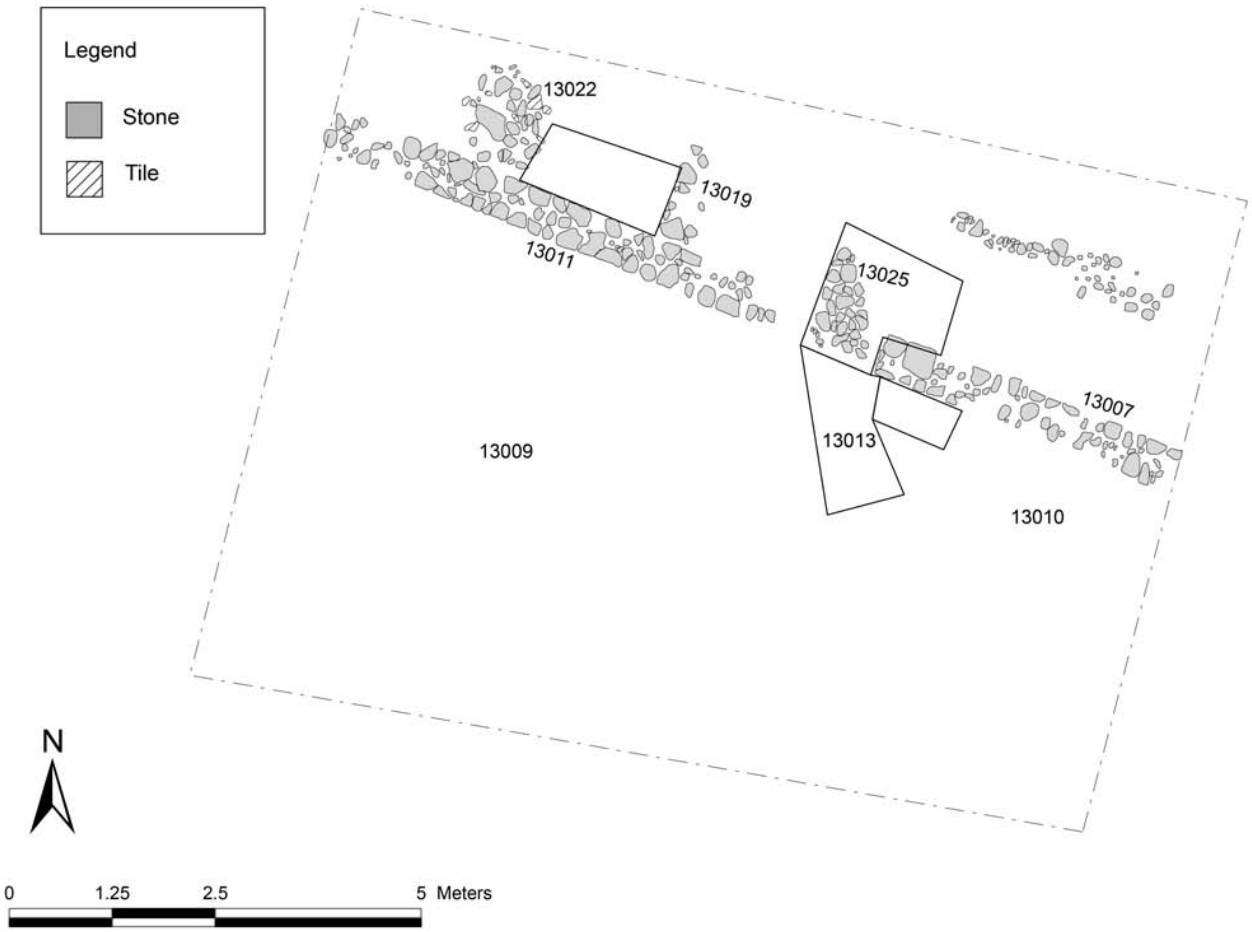


Fig. 10.35 Marzuolo, plan, Area II (ERZ/MS), Structure 3 (ERZ/MS).

Area II chronology

No clear chronological information associated with either the construction or use of this area was discovered. A *sestertius* of Salonina (255–257 AD, SF 213012) was found in the fill of cut SU 13013, tentatively suggesting a date for the later cut/wall/drain insertion. While this is not abundant evidence, it roughly corresponds with Phase 3: The backfill of Area I and, as will be discussed below, the collapse and abandonment of Area III.

Area II discussion

Given the poor preservation of this area, very little could be deduced about its function, but its mural remains provide important information about the overall site morphology.

The orientation of wall SU 13007/13011 parallels those from the other areas of the site and supports the data from the geophysics, indicating a site planned on a single orientation running from Area I in the W at least through Area II in the W. Wall SU 13007/13011 marks the commencement of a line of buildings extending to the N, while the excavations in Area III (see below) indicated a parallel line of buildings extending to the S. Between these two building groups lay the cobble courtyard SU 13008/13010. In the northern part of Area III, as will be seen below, also lay an open area in which were located the two small kilns. Thus, it is possible that these were all part of the same open area, measuring some 30+ m long, which ran through the central/eastern parts of the site. In some areas, this open space was cobbled (Area II) while in others (Area III) it lacked such cobbling. Cobbled surfaces are sometimes associated

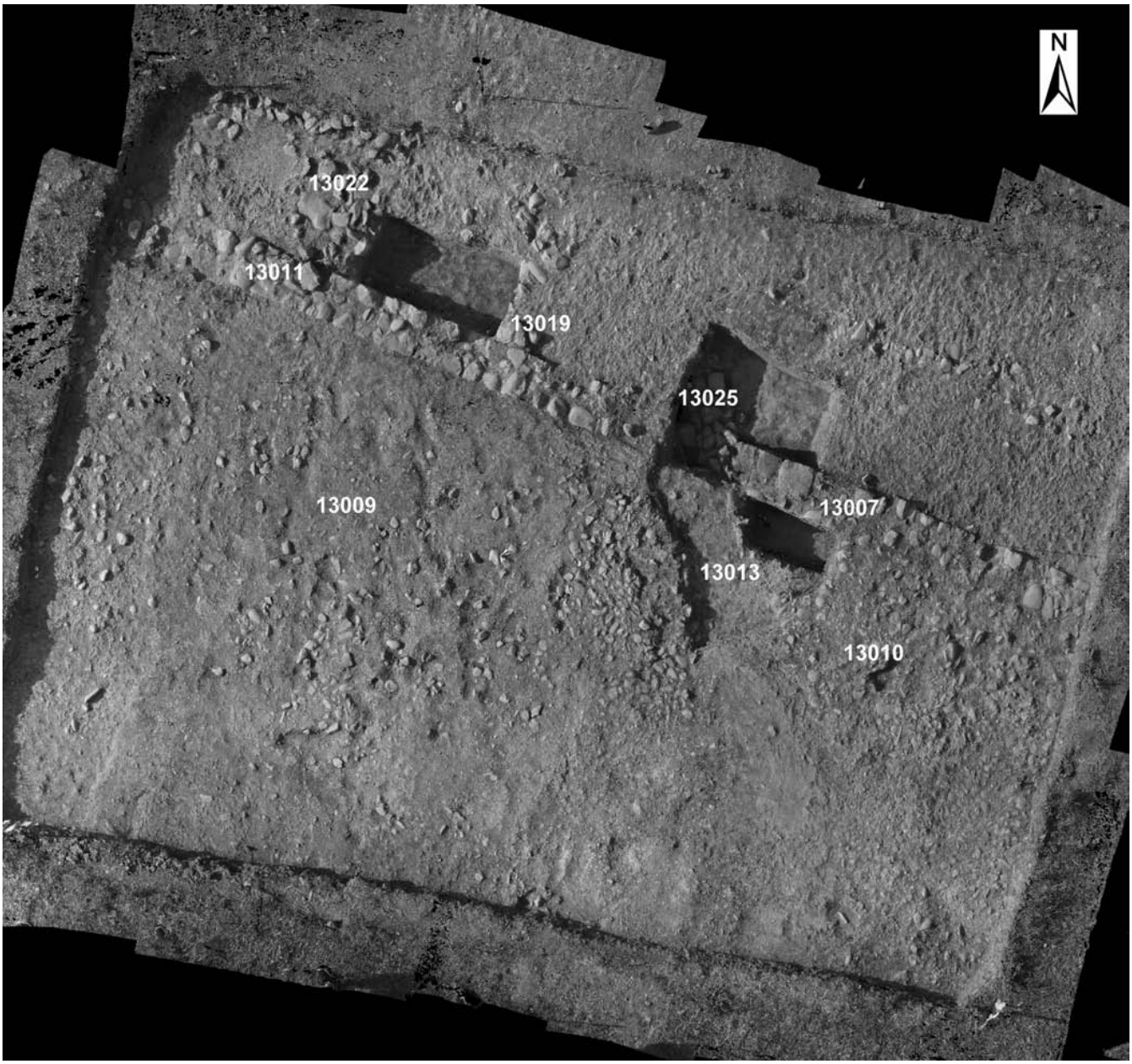


Fig. 10.36 Marzuolo, orthophoto, Area II (MS), Structure 3 (ERZ/MS).

with animals, either for stabling or as stopping point, and indicate a highly trafficked zone.

While the materials from Area II dated only to the final phase of use here (i.e., the later 2nd to 3rd c. AD), the shared orientation with the rest of the site may indicate Phase 1 origins to this area, as with Areas I and III (see below).

10.3.3 Area III

Area III lay some 30 m to the E of Area II and was selected for excavation in 2012 owing to another large magnetometry anomaly in this area (Figs. 10.37 and 10.38). Owing to a slight dip in the land, the preserved levels were somewhat deeper

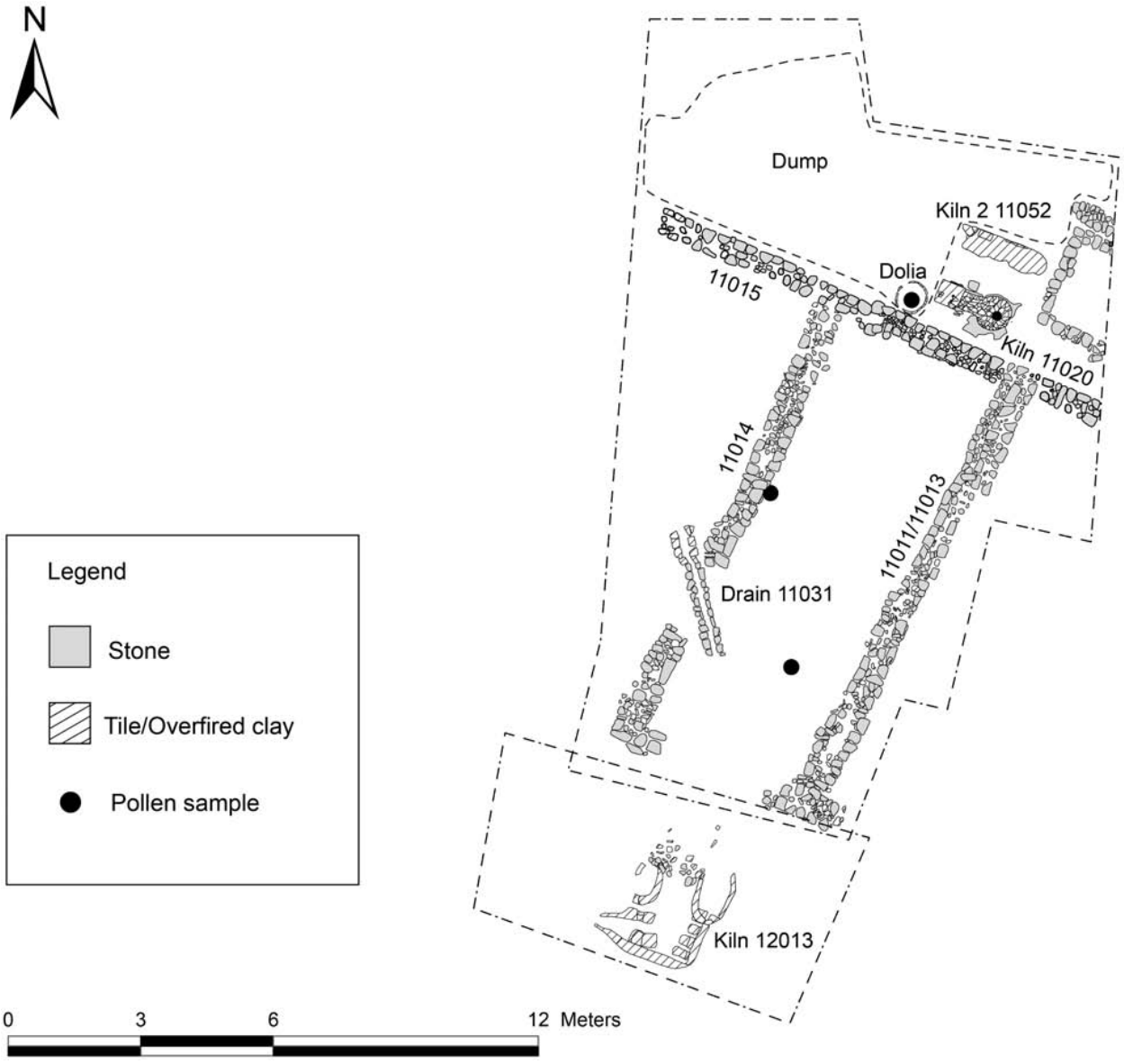


Fig. 10.37 Marzuolo, plan, Area III (ERZ/MS), Structure 4 with location of pollen samples.

Fig. 10.38 Marzuolo, aerial photo, Area III after excavations in 2012 (Photo by Paolo Nannini, reproduced by kind courtesy of the Soprintendenza per i Beni Archeologici della Toscana) (PN).

and preservation better than in Area II. Excavations in Area III produced a rectangular building oriented NE/SW (Structure 4)—the same orientation as the Roman period remains in Areas I and II. A total of three kilns were found near the building, two outside the N end and one outside the S end, as well as some important secondary rubbish dumps that yielded critical information about ceramic production on the site in the early Augustan period.

Structure 4: The Trench in Area III revealed part of a long, NW/SE wall (SU 11015) intersected at right angles by two walls (SU 11011/11018/11013 and 11014) to form a long rectangular room, 11.5 x 5.5 m. The walls were built of unshaped stones and occasional tiles laid without mortar. While only one room was excavated in its entirety, the continuation of SU 11015 to the N and S suggests that the complex had multiple rooms, all on the same alignment. The S wall (SU 11011/11013) showed signs of a large-scale rebuild (SU 11018), indicating that at least this room probably was wholly restructured as some point, while the S wall (SU 11014) was cut by a later drain (SU 11031) running NNW/SSE. Structure 4 opened to the S via a wide (2.7 m) doorway.

The tile roof of the structure was found in collapse both inside (SU 11002, 11006, 11016, 11029, 11047, 11034, and 11028) and to the S of the building in its doorway (SU 12003=12020). One of the tiles bore the graffito "VERECUNDVS." The collapse contexts included not only parts of the tile roof but also

a significant quantity of domestic rubbish, including nails, possibly from the roof construction, glass, faunal materials, coins, and ceramics. This, plus the fact that the tile collapse appeared at different depths, indicates that instead of a single catastrophic event, these contexts represent the slow ruin of the structure over a period of time. Beneath the collapse only fragmentary remains of an abandonment level (SU 11051) and an even more fragmentary possible beaten-earth floor (SU 11053) were found.

Outside Structure 4 to the NE were discovered the floors of two small kilns laid side by side (SU 11020 and 11052), the southern of which (SU 11020) was in better condition (Figs. 10.39–10.41). Kiln 11020 at least seems to have been constructed after, even if very shortly after, the construction of Structure 4, as the use debris abuts wall SU 11015. Both kilns had a circular chamber of 0.8 m in diameter, with a rectangular entrance located to the W. The floors of the kilns were made from bricks. It seems that SU 11052 preceded SU 11020, but only by a decade or two: ceramic assemblages were nearly identical and only stratigraphic relationships suggest the primacy of one over the other.

Around these kilns were found the broken remains of thin-walled, flat ceramic plates, perforated with holes (Fig. 10.42). These may represent quite early and primitive examples of muffles used to protect the ceramics from flame and smoke during firing and to provide even heat. A few fragments of small *tubuli* were also found in the area (Fig. 10.43): *tubuli* were ceramic tubes used convey heat through the upper parts of the kiln structure and are mostly associated with fine ware production (Vaccaro, Capelli, and Ghisleni 2017).

Nearby, abutting the N wall of Structure 4, a dolium (SU 11054) was sunk into the ground. A small stone structure was located adjacent to these kilns to the E, but its excavation revealed no indicative finds or stratigraphy.

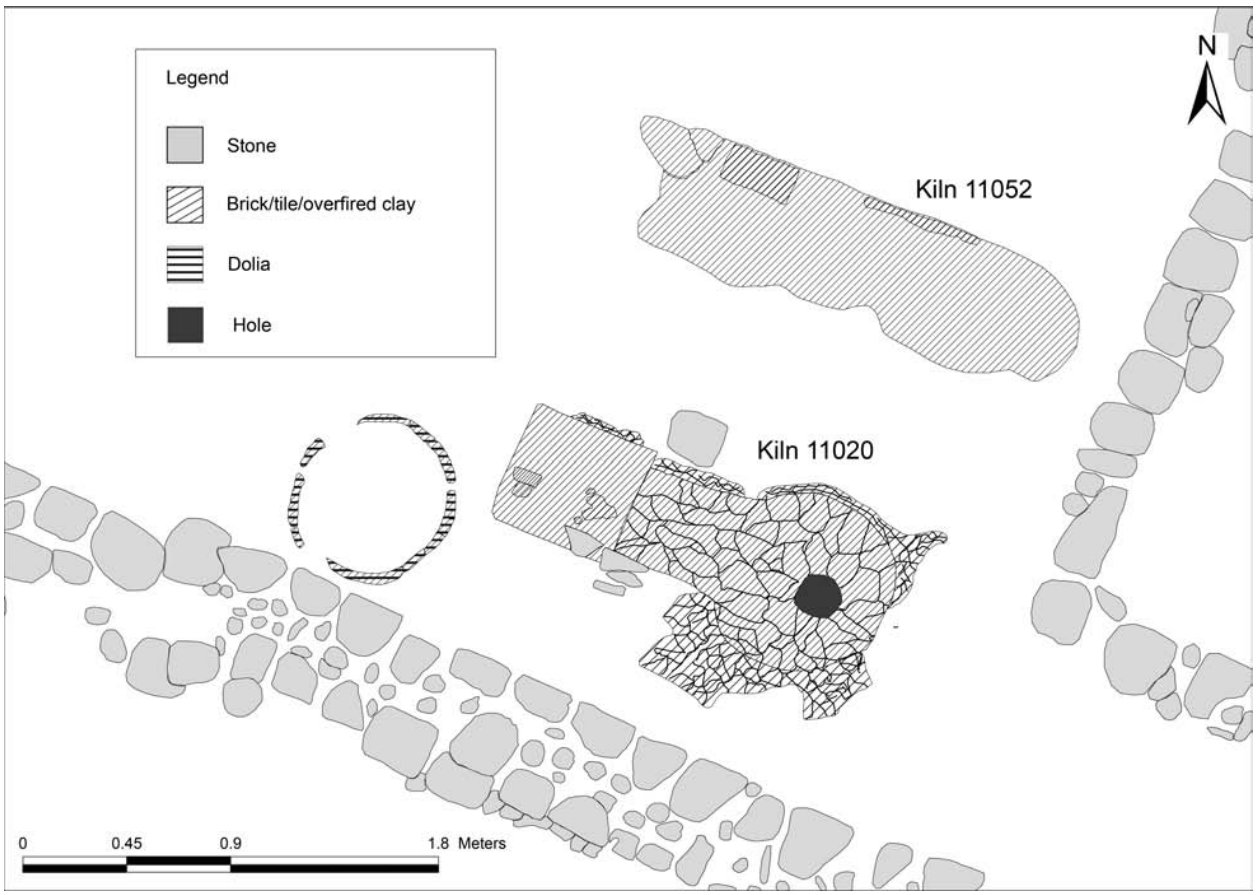


Fig. 10.39 Marzuolo, plans, kiln SU 11020 and 11052 (ERZ/MS).

Fig. 10.40 Marzuolo, view from W, kiln SU 11020.

Fig. 10.41 Marzuolo, view from N, kiln SU 11052 with kiln SU 11020 in background.

Fig. 10.42 Marzuolo, fragments of perforated muffle (?) fragments from SU 11008, 11009, 11048 (EV).

To the W of the kilns lay a large dump, composed of a set of secondary deposits (SU 11012, 11008=11023, 11048=11049, 11043, 11060, 11057, 11058, 11056, 11052). An upper stratum rich in faunal and ceramic finds embedded in a dark organic-rich matrix (SU 11012), lay atop more consolidated contexts which either represented an earlier phase of the dump or a leveling up layer to fill in a small depression in what would have been the building's yard. The ceramics from this dump were found to include an important quantity of so-called "Experimental" phase sigillata, which not only aided in the dating of the site, but also revealed that phases of pre-sigillata production took place at Marzuolo. Many of these Experimental wares show signs of misfiring and some even display stippled misfiring that seems to correspond with the perforations in the muffles found nearby (Fig. 10.44). Some of these Experimental wares were stamped SEX or SEXTI on double line (missing L or LI) and are documented with ten and three specimens respectively; the latter should be read as SEXTILIVS (see Table 10.5 and below). Stamps reading SEX are found at a variety of central Italian sites and associated with early Augustan production, while a SEXTILI stamps are associated with production at Arezzo (Oxé, Comfort, and Kenrick 2000: #1958/1961, respectively). Sextilius is a common name for slaves and freedmen, however, and it is not clear these stamps all derive from the same producer. As shall be discussed further below, wares with these same fabrics were also marketed to nearby rural customers.

In 2013, the excavations in Area III were extended to the S of the building's main door, in order to probe for the presence of a road bounding the

southern edge of the site. Instead, another open yard with a large kiln was found, and the sondage was expanded to reveal this.

Beneath the topsoil, excavations revealed an extension of the same building collapse found inside the structure (see above). Below these levels was found an open yard, into which a kiln (SU 12013) was cut into the surface of the yard such that it presented a semi-sunken aspect (Figs. 10.45 and 10.46). The kiln measured 2.25 m long by 2.5 m wide, with a central combustion chamber oriented SSW, with its entrance to the N. Around the central chamber at the N end were two smaller chambers which exhibited no connection with the central chamber. At the SW corner, a second, narrow entrance opened onto the central chamber.

Two possible main phases were revealed: a major phase which saw the construction of the arches and walls of the main combustion chamber, and a later phase which saw those walls rebuilt, the second narrow entrance inserted to in the SW corner, and the addition of the two small side chambers to the north.

A chunk of red and grey clay (SU 12012) was found abutting the wall of the SW entrance of the kiln. Examination of this clay by the project geoarchaeologist suggested it was not local to the site and may have been brought in to construct either the kiln or the ceramics fired within it. Two fragments of *tubuli* (see Fig. 10.43) were also found in this area, similar to those found in the dumps to the N of the structure.

The S end of the kiln was covered with a deliberate dump (SU 12025=12022=12050=12026), consisting principally of several large broken amphorae. Atop these levels lay thick abandonment and collapse strata (SU 12014, 12011=12030, and 12023=12027=12032).

Only one other feature was found in the yard, a large posthole set just outside and to the east of the door of Structure 4.

Area III chronology

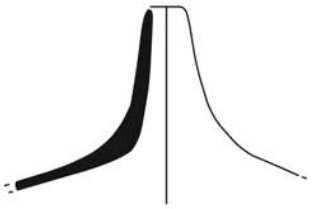
Two major phases of use are documented in Area III, Phases 1 and 3 (Table 10.2). Phase 1 relates

Table 10.2 Marzuolo, Area III, major excavated contexts with diagnostic ceramics/dates (EV).

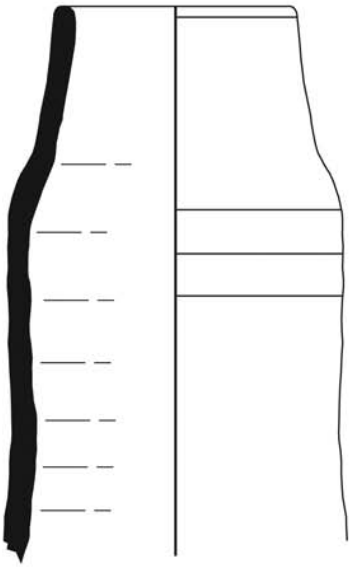
Context	Chronological Information: Pottery	Total MNI	Possible date	Reliability
Phase 1				
11012=11040	Italic sigillata stamped AVRE (1 MNI); Italic sigillata stamped VMBRI (1 MNI); Local Experimental sigillata stamped SEX (1 MNI); Imported Experimental sigillata (Conspectus 1) with pelta decoration (1 MNI)	4	Early to mid Augustan	Very good (Contexts 11012=11040, 11008, 11048, 11055 and 11023 are part of the same deposition)
11043	Baetican Dressel 7/11 amphora (1 MNI); Black Glazed platters (3 MNI); Italic sigillata Conspectus 1 (1 MNI); Local/regional flat-based amphora with triangular rim recalling Dressel 1 (1 MNI)	6	Pre- or early Augustan	Good
11008	Local Experimental sigillata stamped SEX (3 MNI)	3	Early to mid Augustan	Very good
11048	Local Experimental sigillata stamped SEX (5 MNI); Local Experimental sigillata stamped SEXTI (2 MNI)	7	Early to mid Augustan	Very good
11055	Local Experimental sigillata stamped SEXTI (1 MNI)	1	Early to mid Augustan	Very good
11023	Local Experimental sigillata stamped SEX (1 MNI)	1	Early to mid Augustan	Very good
12020+12022	Local/sub-regional flat-based amphora with triangular rim recalling a small Dressel 1 (1 MNI); Local/sub-regional amphora with funnel-shaped rim (2 MNI)	3	Early to mid Augustan	Dump over kiln: Good (Local or sub-regional amphorae are the same as in contexts 11012=11040, 11008, 11048, 11055 and 11023)

Table 10.2 cont'd Marzuolo, Area III, major excavated contexts with diagnostic ceramics/dates (EV).

Context	Chronological Information: Pottery	Total MNI	Possible date	Reliability
12050	Coarse ware closed form (1 MNI); Coarse ware table jar with pointed lip (1 MNI); Coarse ware handled closed form (1 MNI)	3	Early to mid Augustan	Dump over kiln: medium: low MNI (*no* FW). Overall, stratigraphically, it belongs to the same Early to Mid Augustan phase
12051	Coarse ware table jug (2 MNI); Kitchen ware clibanus (1 MNI); Coarse ware bottle (1 MNI); Kitchen ware lid (1 MNI); Kitchen ware cooking pot (1 MN); *Opus doliare* (2 MNI)		Early to mid Augustan	Medium/low; *no* FW. Overall, stratigraphically, it belongs to the same Early to Mid Augustan phase
12023	Local/sub-regional flat-based amphora with triangular rim recalling a small Dressel 1 (1 MNI); Local/sub-regional amphora with funnel-shaped rim (1 MNI)		Early to mid Augustan	Kiln abandonment: medium: *no* FW. (Local or sub-regional amphorae are the same as in contexts 11012=11040, 11008, 11048, 11055 and 11023)
Phase 3				
11053	Lamp: Firmalampen Buchi X type; Padana area or Italic imitation; CW: close handled form (1 MNI); jug (1 MNI); handled form (2 MNI); closed form (1 MNI); KW: pot (1 MNI); lid (1 MNI); Thin Walls: pot (1 MNI); beaker (1 MNI). Residual: Italic sigillata cup Consp. 38.	11	late Antoninian and Severan periods	Beaten earth floor: good, esp. from lamp.
11051	ARS C Hayes 50 A; CW: basin (1 MNI); bowl imitation of the ARS bowl Hayes 14A (1 MNI); jug (1 MNI); KW: casserole (2 MNI) pot (1 MNI)	7	early 3rd c.	Abandonment level: over SU 10053: medium: only ARS and imitations provide precise date
11030	CW: bottle Trefoil type; local or regional (1 MNI); jug (3 MNI); jar (1 MNI); KW: lid (1 MNI); pot (2 MNI). Residual: Italic sigillata cup Consp. 38; cup Consp. 8	10	mid-Roman	Roof collapse; poor: residuals and *no* FW.
11029	ARS C: Hayes 50A (2 MNI); Italic Lamps (3 MNI); Amphorae: Camulodunum 184 (Aegean or Asia Minor) (1 MNI); Beatican for fish sauce; Lamp: Firmalampen type (Padanian area product); (1 MNI); imitation of Firmalampen type (1 MNI) ; CW: Small closed form (1 MNI); basin (1 MNI); table jar: bowl (1 MNI); jug (1 MNI); KW: casserole (4 MNI); pot (3 MNI); bowl (1 MNI); lid (3 MNI): residual: Italic sigillata dish Consp. 20.5; dish Consp. 3.	30	2nd quarter to mid–3rd c. AD	Roof collapse: good. Also a sestertius of Pupienus (238 AD).
11016	ARS A: bowl Hayes 16 (1 MNI); Hayes 6B or C (1 MNI); KW: casserole Flattened and thickened rim type (1 MNI); Amphora: Dressel 14 Baetican (1 MNI). Residual: Experimental sigillata: Bowl Consp. 3/8 (2 MNI); bowl Consp. 38.3; Amphora: Tyrrhenian Dressel 2/4	11	2nd-early 3rd c. AD	Roof collapse: good: while significant residuals ARS A and coin (a bronze of Marcus Aurelius (180–192 AD) give mid-Roman date. Roof collapse: also



Possible narrow-mouthed tubulus (x 2 MNI from Area 11000: Contexts 11012=11040 and 11048)



Tubulus from Area 12000 (1 MNI from Context 12057)

Fig, 10.43 Marzuolo, drawing, fragments of *tubuli* from SU 11012/11040 and SU 11048 (EV).

Fig. 10.44 Marzuolo, fragments of local Experimental sigillata (ES) with 'dotted pattern' caused by the penetration of hot air and gas into the holed muffle.

to the construction and use of Kilns SU 11020 and 11052 to the N of the building. The dump which covers them and into which in part SU 11020 is cut contains a significant quantity of Experimental sigillata which may be dated to 30/20–10 BC. These include Conspectus 8 small carinated cups and Conspectus 1 platters, stamped SEX or SEXT, whose date can be placed in the early Augustan period. The stratigraphically earliest of these contexts (SU 11043) yielded none of these wares and may date to 30 BC or slightly earlier. As the stratigraphically highest of these dump contexts (SU 11023=1108) were found to abut wall SU 11015, we assume that Structure 4 was constructed slightly before or around the same time, that is, 30–10 BC.

Likewise, the kiln SU 12013 found to the S of the building was used and abandoned in the same period. Here the evidence comes from an amphora-rich dump that lay atop the kiln, which included a number of newly documented local amphorae (see below), as well as a few sherds of Experimental sigillata in Conspectus 1 and Conspectus 8 variant.

It is important to note that true Italic sigillata of somewhat later Augustan/Julio-Claudian date, but with the same fabric as the Experimental wares of Phase 1, have been identified via thin section analysis at Pievina, Case Nuove, and four other sites in the surface survey (Vaccaro, Capelli, and Ghisleni 2017 and see below). Near Area III, in a trench excavated by Ghisleni and the Soprintendenza in 2007, a cup base of true Italic sigillata with a central SOC (possibly SOCRATES) stamp had a similar fabric to the group stamped SEX/SEXTI (Vaccaro, Capelli, and Ghisleni 2017). All of this admittedly very ephemeral data suggests an intermediate production phase of later Augustan/Julio-Claudian date, possibly somewhere nearby Area III.

Phase 3: Interestingly, the Phase 2 production phases from Area I dating to 50–70 AD are not found in Area III. Instead, the next phase for Structure 4

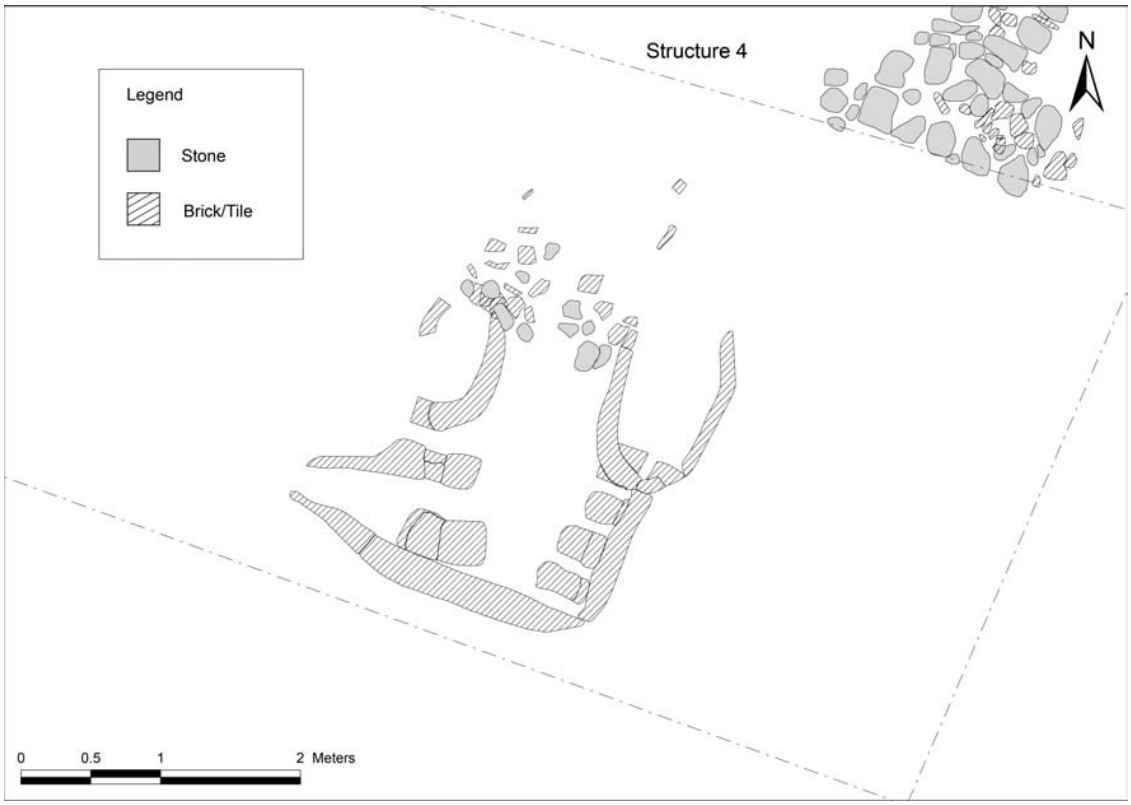


Fig. 10.45 Marzuolo, plan of kiln SU 12013 (ERZ/MS).

Fig. 10.46 Marzuolo, view from the N, kiln SU 12013.

appears in the late 2nd/early 3rd c. AD with a beaten earth floor that produced a Firmalampe (Buchi X type) of Padanian or Italic origin dating to that period. The abandonment and collapse of the room took place shortly after, that is, the later 2nd or early 3rd c. AD, with some later activity. In support of this date are the several 2nd–3rd c. coins found in the collapse levels, including from SU 11016, a bronze of Marcus Aurelius (180–192 AD) (SF 211006) and a *sestertius* of Severus Alexander (230 AD) (SF 211007), from SU 11029 a *sestertius* of Pupienus (238 AD) (SF 211011), from SU 11036 a *sestertius* of Maximinus Thrax (235–238 AD) (SF 211012), and only from the collapse outside the structure to the S (SU 12004) two coins of Maxentius (306–313 AD) (SF 212002, 212003) (see below and Table 10.23). The ceramics from this phase are quite uniform, gravitating around 2nd–3rd c. dates. The largest of these contexts with 30 MNI (SU 11029), yielded more specific indications towards the later part of this period through the presence of three dishes Hayes 50A in African red slip ware of C production. The abandonment level (SU 11051) suggests very similar dates with another ARS C dish Hayes 50A and one local/regional imitation of Hayes 14A.

10.4 Ceramics (EV, KB)

The Experimental and Italic sigillata produced at Marzuolo will be the subject of a separate monograph. The discussion here summarizes those discoveries, but focuses on those contexts and ceramics which help describe other activities at the site—dining, food preparation, storage, and imports—during the site's three major phases of use in the Augustan period, 50–70 AD, and the later 2nd–3rd c. AD (see Tables 10.3 and 10.4).

Phase 1

The contexts which supply information about life in the earliest, Augustan phase on the site are the dumps from Area III, and the two small construction-phase contexts from Area I (total 421 MNI). These dumps were composed of roughly similar quantities of fine wares (44.88%) as coarse and kitchen wares (40.13%), in keeping with their seeming taphonomy as both secondary rubbish and ceramic production dumps. Like many sites in the project, wares for dining and table use outnumbered those for cooking, here almost three to one (67:20%).

The fine wares were dominated by the Experimental sigillata (22.09% of the overall phase MNI), seemingly produced in this Area (Fig. 10.47). These wares, which though presenting features similar to Italic sigillata, such as the levigation of the fabrics, the sintered slip, the similarity of the forms and the presence of the central and radial stamps on the bottom, also reveal differences like the high incidence of misfiring, often observable in the same vessel (with tones turning from red to dark brown and black), the presence of non-slipped or semi-slipped vessels, and a somewhat low level of standardization that results in the presence of a large number of variants to the same type and a few forms not precisely comparable to the main known Italic sigillata types. Some 68.5% Experimental sigillata vessels from Area III are misfired, whereas some 2.2% are non-slipped. Many of the vessels have a kind of "dotted" pattern that appears frequently both on the stamped bases and on rims and carinated walls, which seem to belong to the same production (see Fig. 10.44). We linked this feature to the use of a very rudimentary muffle (see Fig. 10.42) used to fire vessels, which did not guarantee the homogeneous indirect flame firing process expected for the production of red slipped fine wares (Vaccaro, Capelli, and Ghisleni 2017).

Some of Experimental wares bear stamps reading SEX and SEXTI on double line (missing L or LI) with ten and three specimens respectively; the latter should be read as SEXTILIVS (see Fig. 10.47.14–15). They both belong to the early Augustan period. Unfortunately, the fragmentary state of the materials prevents us from reconstructing the whole profile of stamped forms which, according to the bases, seem to belong to both small carinated cups (Conspectus 8) and platters (Conspectus 1). At least 20 vessels among the total Experimental sigillata are of the early Conspectus 1 type (Fig. 10.47.1) and both the fabric and misfiring features are fully compatible with the large bases stamped SEX and SEXTI, suggesting that this type was included in that production. It is worthy of note that one Conspectus 1 platter is non-slipped (observation confirmed by thin section analysis); another specimen can be attributed to a non-slipped kiln waster.

A total of 63 Experimental sigillata vessels were attributed to existing types and new variants (e.g.,

Table 10.3 Marzuolo, ceramic classes, all phases, by MNI and %MNI of diagnostics (EV).

Ware	Marzuolo Phase 1 (730 diagnostics/421 MN)	Marzuolo Phase 2 (3014 diagnostics/334 MNI)	Marzuolo Phase 3 (533 diagnostics/251 MNI)
BGW	19 or 4.51%	0 or 0%	4 or 1.59% (residual)
Italic sigillata	54 or 12.82%	264 or 79.04%	14 or 5.57% (residual)
Thin walls	23 or 5.46%	4 or 1.19%	7 or 2.78%
Experimental sigillata	93 or 22.09%	0 or 0%	5 or 1.99% (residual)
ARS	0 or 0%	0 or 0%	13 or 5.17%
Color-coated ware	10 or 2.37%	3 or 0.89%	13 or 5.17%
SCT	0 or 0%	0 or 0%	0 or 0%
Late Italic sigillata	0 or 0%	0 or 0%	6 or 2.39%
Coarse ware	90 or 21.37%	13 or 3.89%	58 or 23.1%
Kitchen ware	79 or 18.76%	9 or 2.69%	49 or 19.52%
Tunisian kitchen ware	0 or 0%	0 or 0%	9 or 3.58%
Amphorae	22 or 5.22%	40 or 11.97%	42 or 16.73%
Coarse ware/amphorae	5 or 1.18%	0 or 0%	2 or 0.79%
VRI	8 or 1.9%	0 or 0%	12 or 4.78%
Dolia	2 or 0.47%	0 or 0%	3 or 1.19%
Lamps	12 or 2.85%	1 or 0.29%	13 or 5.17%
Loomweights	0 or 0%	0 or 0%	0 or 0%
Amphora stopper	0 or 0%	0 or 0%	0 or 0%
Other ware (*tubuli*? and kiln spacers)	4 or 0.95%	0 or 0%	0 or 0%
Thin walls/coarse ware	0 or 0%	0 or 0%	1 or 0.39%
Color-coated ware/coarse ware	0 or 0%	0 or 0%	0 or 0%

Fig. 10.47.6, 12) and reveal a wide range of functional forms, including a number of large and medium-sized platters, both handled and non-handled cups, and carinated bowls. Figure 10.47 is a selected sample of documented forms and variants in which we clearly observe the low level of standardization typical of the Experimental sigillata at Marzuolo. Production here must have included the Conspectus 1 platters but also other platters (Conspectus 10, 11, and 12) (Fig. 10.47.2–4), bowls Conspectus 3/8 (Fig 10.47.5), and perhaps the handled cups Conspectus 30 and 38 (Fig. 10.47.10–11) which often appear highly misfired with the same tones as the stamped bases SEX and SEXTI and, in one case, non-slipped.

Thin section analysis of the wares found in the Phase 1 dumps revealed a variety of interesting features, both about their manufacture and most importantly about their distribution. Examination of the clays and firing suggest a certain heterogeneity of clay sources—although they all have a dominant iron-rich component associated with a subordinate calcareous one, and some difference in the degree of levigation. More marked variety was found in firing temperature, from moderate to very high. Both findings are consistent with a new workshop and the inconsistent production that comes with experimentation.

Thin section analysis was also used to find ceramics at the other project sites with similar fabric. Fabric from the Marzuolo Experimental sigillata were matched with Experimental wares from Tombarelle, and with Italic (not Experimental) specimens from surface finds at Pievina, Case Nuove Phase, and four surface survey sites (TU 166, 235, 309, 310) (Fig. 10.48). These connections demonstrate that wares from Marzuolo's earlier phases were

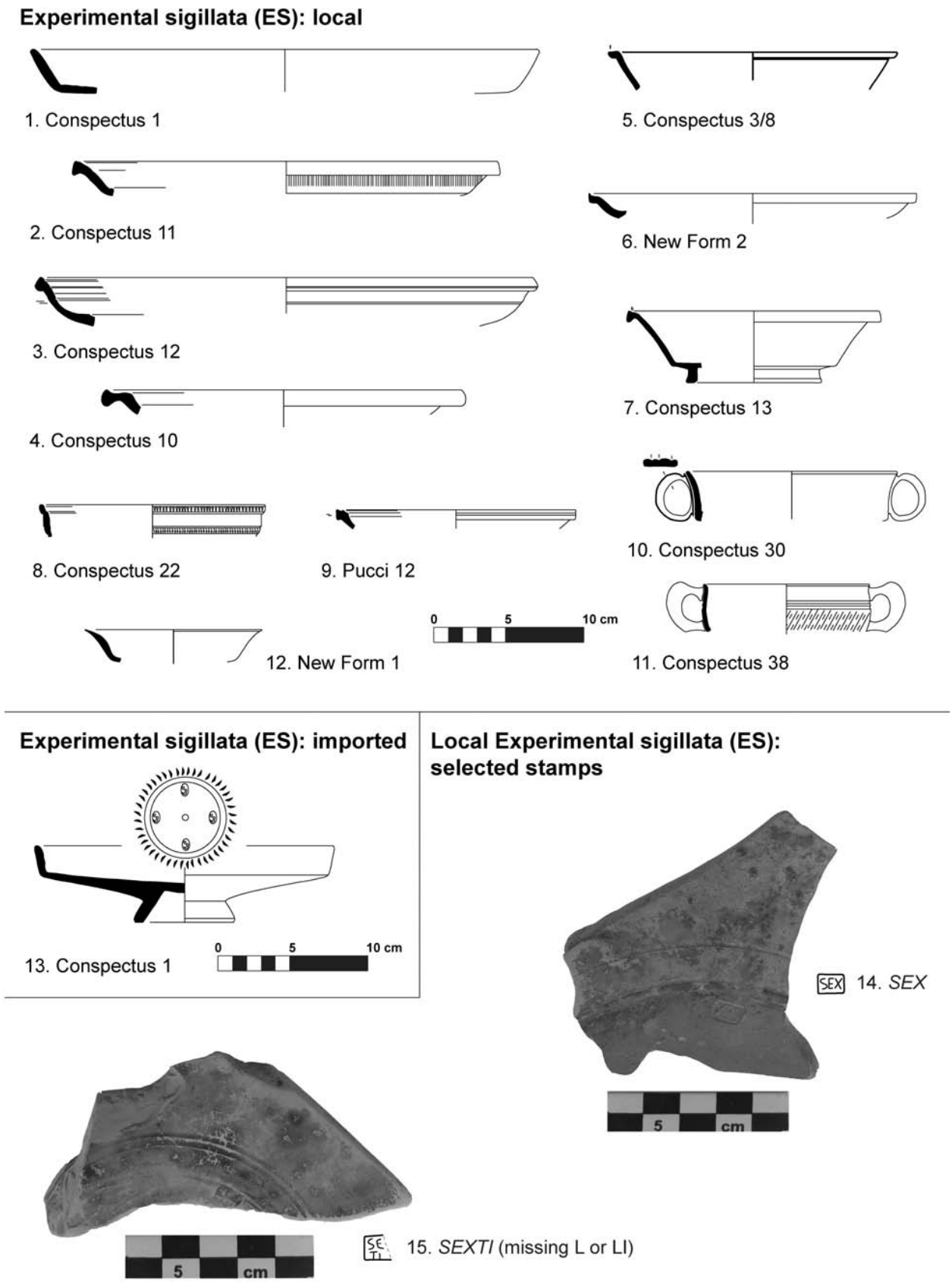


Fig. 10.47 Marzuolo, Phase 1, selected Experimental sigillata (ES) of local production and imported (Area III). Local products: 1. Dish Conspectus 1; 2. Dish Conspectus 11; 3. Dish Conspectus 12: 4. Dish Conspectus 10; 5. Bowl Conspectus 3/8; 6. Bowl New Form 2; 7. Bowl Conspectus 13; 8. Bowl Conspectus 22; 9. Bowl Pucci 12; 10. Cup Conspectus 30; 11. Cup Conspectus 38; 12. Cup New Form 1. Importation: 13. Dish Conspectus 1 with radial decoration. Selected stamps on local products: 14. SEX; 15. SEXTI (missing L or LI) (EV).

Table 10.4 Marzuolo, ceramic forms/functions, all phases, by MNI and % of MNI of diagnostics (EV).

FORMS	Marzuolo Phase 1 (730 diagnostics/421 MN)	Marzuolo Phase 2 (3014 diagnostics/334 MNI)	Marzuolo Phase 3 (533 diagnostics/251 MNI)
KITCHEN (includes KW and VRI)	**87 or 20.66%**	**9 or 2.69%**	**69 or 27.49%**
Generic closed forms for kitchen	0	0	0
Cooking pots	53 or 12.58%	5 or 1.49%	22 or 8.76%
Cooking jugs	0	0	1 or 0.39%
Generic open forms for kitchen	0	0	0
Casseroles	3 or 0.71%	1 or 0.29%	16 or 6.37%
Cooking bowls	2 or 0.47%	0	2 or 0.79%
Frying pans/*tegami*	11 or 2.61%	3 or 0.89%	15 or 5.97%
Bread-baking pans/*testi*	0	0	0
Clibani	2 or 0.47%	0	0
Cooking lids	16 or 3.8%	0	13 or 5.17%
DINING/STORING (includes CW, FW, and CCW)	**285 or 67.69%**	**284 or 85.02 %**	**118 or 47.01%**
Generic closed forms for table and storage	22 or 5.22%	0	9 or 3.58%
Jugs	26 or 6.17%	7 or 2.09%	24 or 9.56%
Jars	7 or 1.66%	3 or 0.89%	6 or 2.39%
Jugs/jars	9 or 2.13%	2 or 0.59%	0
Beakers	18 or 4.27%	2 or 0.59%	5 or 1.99%
Small table pot	9 or 2.13%	6 or 1.79%	6 or 2.39%
Bottles	12 or 2.85%	0	5 or 1.99%
Flasks	0	0	0
Chalice	0	11 or 3.29%	2 or 0.79%
Flanged-Bowls	0	0	0
Generic opens forms for table	8 or 1.9%	1 or 0.29%	3 or 1.19%
Bowls	53 or 12.58%	0	19 or 7.56%
Cups	37 or 8.78%	114 or 34.13%	8 or 3.18%
Dishes	76 or 18.05%	131 or 39.22%	21 or 8.36%
Bowls/Dishes	0	0	1 or 0.39%
Basins	5 or 1.18%	0	4 or 1.59%
Lids	3 or 0.71%	7 or 2.09%	5 or 1.99%
Small vessels for sauces or perfumes(?)	0	0	0
Uncertain (food processing?)	0	0	0
Mortaria	0	0	0
TRANSPORT and STORAGE	**28 or 6.65%**	**40 or 11.97%**	**50 or 19.92%**
Amphora stoppers	0	0	5 or 1.99%
Amphorae	21 or 4.98%	40 or 11.97%	42 or 16.73%
Dolia	2 or 0.47%	0	2 or 0.79%
Table amph/jar	5 or 1.18%	0	1 or 0.39%

Table 10.4 cont'd Marzuolo, ceramic forms/functions, all phases, by MNI and % of MNI of diagnostics (EV).

FORMS	Marzuolo Phase 1 (730 diagnostics/421 MN)	Marzuolo Phase 2 (3014 diagnostics/334 MNI)	Marzuolo Phase 3 (533 diagnostics/251 MNI)
LIGHTING	**12 or 2.85%**	**1 or 0.29%**	**13 or 5.17%**
Lamps	12 or 2.85%	1 or 0.29%	13 or 5.17%
OTHER "FUNCTIONAL" CERAMICS	**9 or 2.13%**	**0**	**1 or 0.39%**
Loomweights	0	0	0
Drains	0	0	0
Unguentaria	2 or 0.47%	0	1 or 0.39%
Kiln spacers	2 or 0.47%	0	0
Molds	1 or 0.23%	0	0
Tubuli	3 or 0.71%	0	0
RESIDUALS	**0**	**0**	**0**
UNCERTAIN	**1 or 0.23%**	**0**	**0**

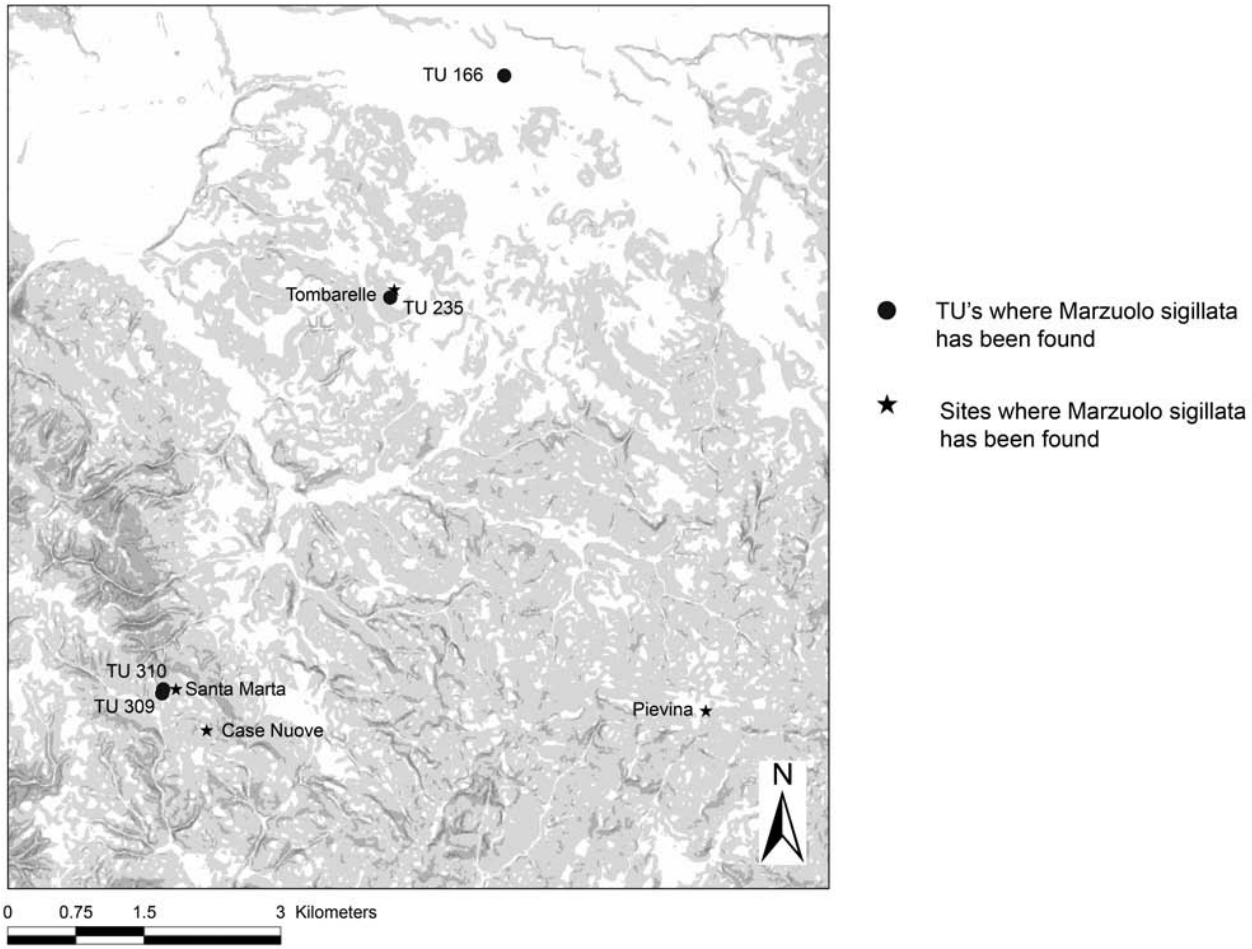


Fig. 10.48 Map showing Marzuolo wares (both Experimental and Italic sigillata) as distributed in the project area (EV/ERZ).

probably marketed locally (Vaccaro, Capelli, and Ghisleni 2017). These findings further suggest that Marzuolo may have produced true Italic sigillata after the Phase 1 Experimental wares, but before the later Phase 2 wares.

It is important to note, however, that the inhabitants of Marzuolo in this period were not only using fine wares that they themselves were producing. Thin section analysis revealed both Experimental sigillata that came from elsewhere, probably Lazio/Campania (Vaccaro, Capelli, and Ghisleni 2017) (Fig. 10.47.13).

Tablewares did not just consist of the local Experimental fine wares: coarse ware tablewares comprise a significant percentage of tablewares and were dominated by jugs (6.17%), beakers (4.27%), jars (1.66%), and other closed forms for holding liquids (5.22%).

The cooking wares from this phase speak to the domestic as well as production function of Area III and Structure 4. Wares for cooking comprise 20.66% of the assemblage: some 12% are pots, while a minority (some 3.3%) include open form vessels like casseroles and *tegami*. As discussed at Case Nuove (Ch. 5), the presence of both open and closed forms speaks to a variety of cooking methods, boiling and frying/grilling. Like there, the mixed ages of the major domesticates in this phase (see below) which include older and some younger animals, are not matched by a larger proportion of open formed vessels for frying or braising.

Finally, transport amphorae comprise a much smaller percentage of the overall assemblage than they will in later phases (4.58%) (Fig. 10.49). The majority of these came from a dump deposited over the abandoned kiln to the S of Structure 4. These consisted entirely of a newly identified local/regional version of one of two types: one with triangular rim (whose shape reminds one of the Dressel 1 type), with grooved handles and flat/ring foot base (Fig. 10.49.7–9); and one with funnel-shaped ("imbuto") rim (Fig. 10.49.1–6). Unfortunately, no wasters or overfired fragments were found during excavation, which would have suggested in situ production. Nonetheless we are inclined to believe that the source of both the amphorae and much of the coarse wares, particularly those found in the dump over the kiln, should not be very far from Marzuolo given the homogeneity of the fabrics.

Phase 2

The assemblage of Phase 2 (334 MNI) was dominated by the single cache (SU 10093) of Italic sigillata (250 MNI), an artifact of discovery that skews both the class and formal quantification of this phase (see Fig. 10.15 and Color Figs. 10.16). As noted above, this production cache will be the product of a separate detailed publication (see also Vaccaro, Capelli, and Ghisleni 2017).

In sum, 250 Italic sigillata vessels were found still divided into well-organized stacks, including dishes, platters, flanged cups, carinated cups, chalices, and pyxides (Fig. 10.50). The best preserved stacks included those of Conspectus 3 dishes, Conspectus 4 platters and two different modules of Conspectus 34 flanged cups (see Fig. 10.50 and Color Fig. 10.51). Accurate stacking also characterized a series of carinated cups of type Pucci XXIX, all of the same shape although varying in size. Even the very large Conspectus 20 and Conspectus 21 platters were piled up, although their smaller numbers resulted in less impressive stacks. The stacking criterion for chalices seems to have been less regular whereas a series of pyxides with their lids happened to be found placed one inside the other from smaller to larger (five modules were observed) like a set of Russian dolls. The accurate original subdivision of the vessels, their type-by-type stacking and the small area of the deposit all suggest that we are dealing with materials stored on a shelf or in a cupboard.

As many as 129 vessels (51.6%) showed evidence of more or less marked misfiring ranging from red to dark reddish brown on the same vessel with clear differences between one side and the other one or the inside and outside (see Color Fig. 10.51). In a number of cases, the color of the same specimen varies from dark reddish brown to black. Particularly worth noting are the firing defects observed in the upper part of the stacks of vessels, with proper red slipped specimens from the bottom up to the middle of the stack, where they began to be progressively more misfired reaching the darker colors at the top of the stack itself. The stack of Conspectus 4 platters composed of 43 vessels is representative: starting from the bottom the first 18 vessels were red, from the 19th to the 29th they varied from brown to dark brown, then they progressively turned into darker tones of brown up to the 34th, whereas the last nine vessels were almost completely black.

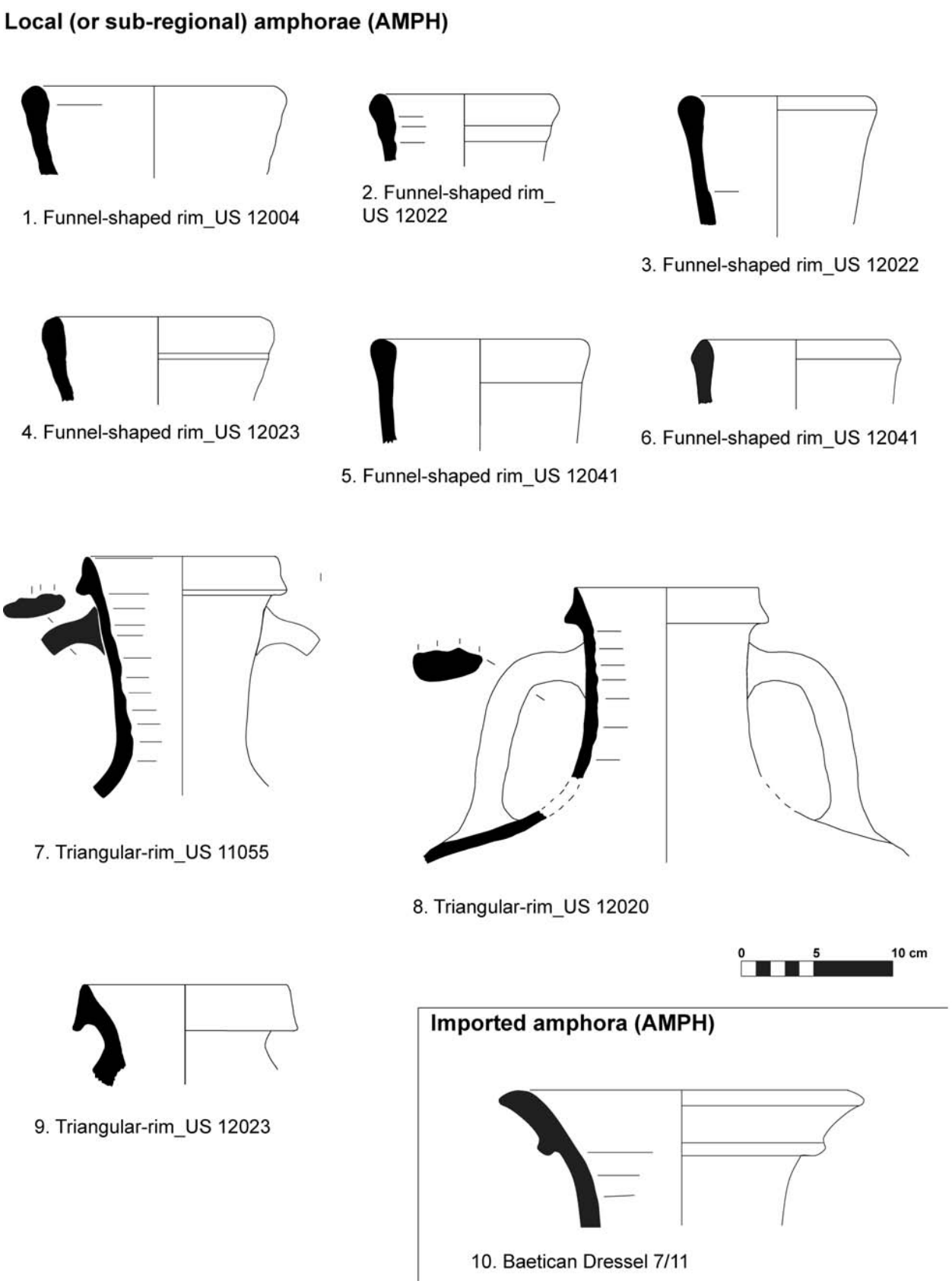
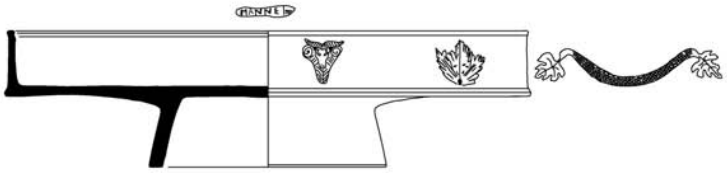
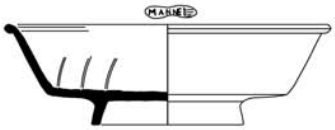


Fig. 10.49 Marzuolo Phase 1, amphorae of local/sub-regional production and imported (Area III). Local or sub-regional products: 1–6. Funnels-shaped rim types; 7–9. Triangular-rim types. Imported amphora: 10. Baetican Dressel 7/11 (EV).

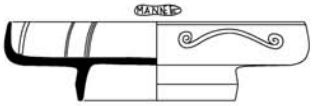
Italic sigillata (IT SIG): *MANNEIVS*' production



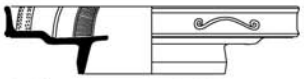
1. Conspectus 20.4



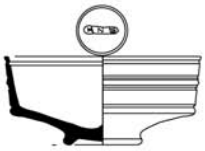
2. Conspectus 3.3



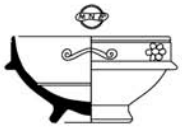
3. Conspectus 4.6.1



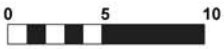
4. Conspectus 21.3



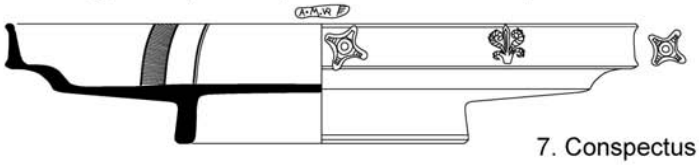
5. Pucci 29



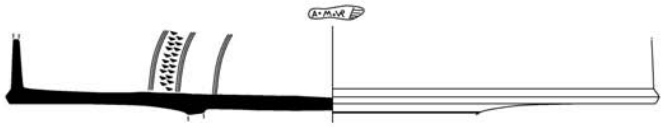
6. Conspectus 34



Italic sigillata (IT SIG): *A.M.VRBANVS*' production

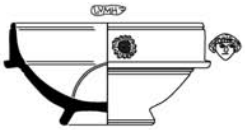


7. Conspectus 21.3



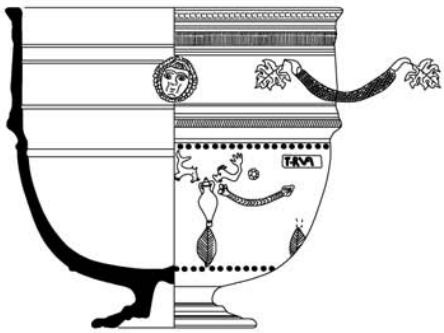
8. Conspectus 20.4

Italic sigillata (IT SIG): *L.VMBRICIVS H*()' production



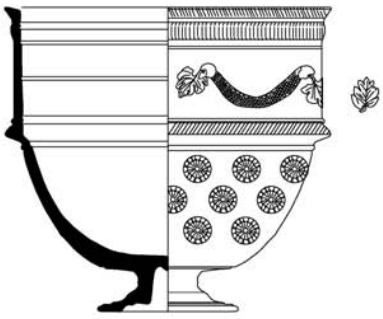
9. Conspectus 34

Italic sigillata (IT SIG): *T.RVFRENVS*' production

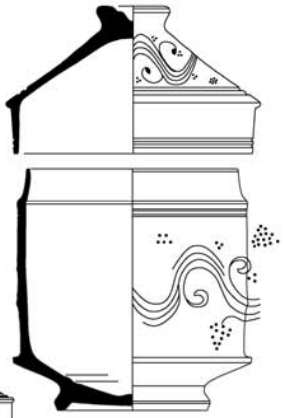


10. Conspectus R 9.2.1

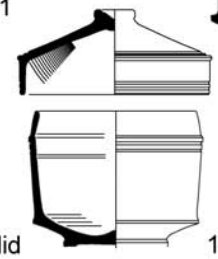
Italic sigillata (IT SIG): non-stamped products



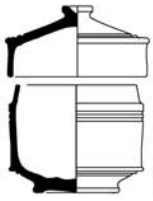
11. Conspectus R 9.2.1



12. Pyxis with lid



13. Pyxis with lid



14. Pyxis with lid

15. Pyxis with lid

Thin section analysis applied to 15 samples from this deposit bearing different stamps revealed the same type of levigated fabric rich in mica flecks, with microfossils and rare argillites (infra). The slip is highly characteristic: it is relatively thick, well sintered, and highly levigated. The fabrics analyzed do not show any parallel with known products from Arezzo, Pisa, or Torrita di Siena, the latter of which are more regular and homogeneous than those from the Phase 1 production phase.

The epigraphic evidence offered by stamps on 172 vessels help define the organization of production and those involved in it (Table 10.5). A total of 146 vessels are stamped MANNEIUS, with a variety of three or four different stamps depending on the size of the vessel. Platters such as forms Conspectus 3.3, Conspectus 4.6.1, Conspectus 20.4, Conspectus 21.3 are all stamped with the longer *in planta pedis* stamp MANNE (Oxé, Comfort, and Kenrick 2000:1099). On the other hand, smaller vessels, such as Conspectus 34.2 cups and the carinated cups (form Pucci XXIX) bear the abbreviated name which may be AˆMN (Oxé, Comfort, and Kenrick 2000:1101, particularly nos. 15–16) or far more usually MN.[2] In many cases the smaller stamps must have been made by very worn punches as they are often difficult to read, particularly the ligature AˆM which was observed with certainty only on five Conspectus 34 cups (Fig. 10.50 for the forms). In most cases, MANNEIVS is documented only with the nomen. The Manneius producer has thus far been documented as working 30–70 AD.

The other two individuals involved in the production of this batch are different: A. M ( ) URBANUS (Oxé, Comfort, and Kenrick 2000:1061), with three stamps, and L. VMBRICIVS H ( ) (Oxé, Comfort, and Kenrick 2000:2470) documented with 22 stamps. Urbanus has been documented as working 30 AD and later, while Umbrichius is dated somewhat later, 50 AD and beyond. At Marzulolo, the former stamped very large versions of Conspectus 21.3 and Conspectus 20.4 platters, whereas the latter only stamped variants of the flanged cup Conspectus 34, larger than those produced by MANNEIVS. It is also worth noting one mold-decorated chalice is signed by T. RVFRENVS whose activity is hitherto documented in Arezzo in the first four decades of the 1st c. AD (Fig. 10.50 for the forms).

Table 10.5 Marzuolo, list of the Italic sigillata stamps documented at Podere Marzuolo (EV).

Stamp	MNI
Planta pedis *MANNE*	82
Planta pedis *MN*	59
Planta pedis *A.MN*	5
Planta pedis *A.M.VR*	3
Planta pedis *L.VM.H*	22
Framed *T.RVFR*	1
TOTAL	**172**

Although the evidence provided by this batch alone cannot offer an overview of Italic sigillata likely to have been produced at Marzuolo in the third quarter of the 1st c. AD, it helps us to address some preliminary questions. Some sort of collaboration between Manneius and the gens Vmbricia had already been observed at Torrita di Siena where, although local production seems to have been controlled by Umbricius Cordus, at least one stamp by Manneius was found among the locally produced sigillata (Pucci 1992:113–116 and 143–145). At Torrita di Siena, seven stamps, of the same L. VMBRICIVS H ( ) documented at Marzuolo were found, suggesting that the structure of the workshop at Torrita di Siena saw the enterprise run by the Umbricii, mainly by Cordus, whereas at Marzuolo we have the reverse situation with Manneius leading the activity and relying on other producers, possibly by subcontracting

Fig. 10.50 (*facing*) Marzuolo, Phase 2, selection of local Italic sigillata (IT SIG) dated AD 50–70 from deposit US 10093: stamped and non-stamped vessels. MANNEIVS' production: 1. Large dish Conspectus 20.4; 2. Platter Conspectus 3.3; 3. Platter Conspectus 4.6.1; 4. Platter Conspectus 21.3; 5. Cup Pucci 29; 6. Cup Conspectus 34. A.M.VRBANVS' production: 7. Large dish Conspectus 21.3; 8. Large dish Conspectus 20.4. L.VMBRICIVS H()' production: 9. Cup Conspectus 34. T.RVFRENVUS' production: 10. Chalice Conspectus R 9.2.1. Non-stamped vessels: 11. Chalice Conspectus R 9.2.1; 12–15. Pyxides with lids (EV).

out to them the production of vessels not included in his local repertoire. Another equally plausible option might be that the other potters involved at Marzuolo were not present at all but simply gave their stamps and other equipment to Manneius as a guarantee of participating in the enterprise and being paid for their products.

The likely presence of Manneius's branch at Marzuolo in 50–70 AD sheds new light on the importance of the site for the local and possibly regional markets. After a period with no evidence for production, it seems to recommence using raw materials and techniques not completely similar to the experimental production, a variety of perfectly sintered sigillata vessels, and involving at least four producers. Production activities seem to be contemporary with those of Torrita di Siena but involved a wider repertoire of Italic sigillata, including all the main forms documented at the time; the absence of chalices and pyxides at Torrita, but present at Marzuolo, is noteworthy. All the vessels manufactured at Marzuolo are characterized by a distinctive fabric and slip which will help track their distribution in the future.

Our distribution study, limited to excavated and surface sites in the territory of Cinigiano, did not produce precise matches with these wares (Vaccaro, Capelli, and Ghisleni 2017). However this is not surprising given the low count of both excavated and surface contexts belonging precisely to the mid/second half of the 1st c. AD: most of the evidence offered by excavation and field surveys is in agreement on a peak in rural settlement between the second half of the 1st c. BC and first decades of the 1st c. AD with a marked drop immediately after. Nonetheless it should be noted that a few Italic sigillata vessels from the site at Poggio dell'Amore (dated to the first half of the 1st c. AD and possibly slightly beyond) are characterized by a fabric macroscopically similar to that of the Italic sigillata from Marzuolo dated 50–70 AD (see Ch. 7 above).

How these potters and their helpers were provisioned and how they cooked and dined remains under-documented. Outside of this single context, ceramic finds were relatively sparse with the exception of the hearth area in Area I (SU 10055) and the large deposits of amphorae from that same phase. Coarse and kitchen wares were proportionally tiny (3.89 and 2.69% respectively). Cooking wares were split between closed (pots: 1.49%) and open (casseroles and *tegami*: 1.18%) (Fig. 10.52.12–15). With the caveat of the small MNI, this relatively larger percentage of open wares is distinct from the previous phase but might seem to track the similarly lacunose faunal data (see below) with its higher percentage of younger animals including younger pigs. Removing the sigillata kiln cache from consideration, it is important to note that the major presence of closed form tablewares, including coarse ware jugs, jars, and beakers, is similarly common in all our late Republican sites.

Aside from the extraordinary cache of Italic sigillata, the more notable component of this phase is the large quantity of amphorae (some 40 MNI or 11.97% of the Phase 2 assemblages) (Fig. 10.53). Four main sources were identified (Table 10.6). As with the previous phase, the majority of these (53.8%) included newly identified local or regional variants. A new class of sub-regional or local flat-based wine amphora in the tradition of the Spello type is attested by a total of 14 vessels likely belonging to two main modules: a larger one whose height must be between 55 and 60 cm and a smaller one (Fig. 10.53.1). This amphora type does not have specific parallels in other published sites of Tuscany and central Italy, but its shape and size are generically referable to the production of early imperial small amphorae with a flat base whose manufacture in central Italy is well exemplified by the Spello, Sant'Arcangelo and Forlimpopoli types (Bertoldi 2012:106, 112–113). It is also worth noting the significant presence of wine amphorae from the Aegean area and Asia Minor such as the Camulodunum 184 and Dressel 5 types with three and six specimens respectively. Finally, one Baetican fish sauce amphora was noted (Fig. 10.53.2–5).

It is difficult to say if wine and fish sauce were intended for consumption at the site or if the amphorae were stored at Marzuolo with the purpose of being later traded locally. The lack of contemporary amphora assemblages excavated at other sites in the area prevents us from comparing the amphora profile at Marzuolo with that of other rural settlements. However, it seems clear that the number of large overseas amphorae which reached Marzuolo in the second half of the 1st c. AD emphasizes the centrality of the site as an exchange hub in the locale. More work on the early imperial ceramic assemblages from the urban site of Roselle is needed to determine if the town served as a redistribution hub for inland territories as we have already seen for the late antique period (see Chs. 4 and 15).

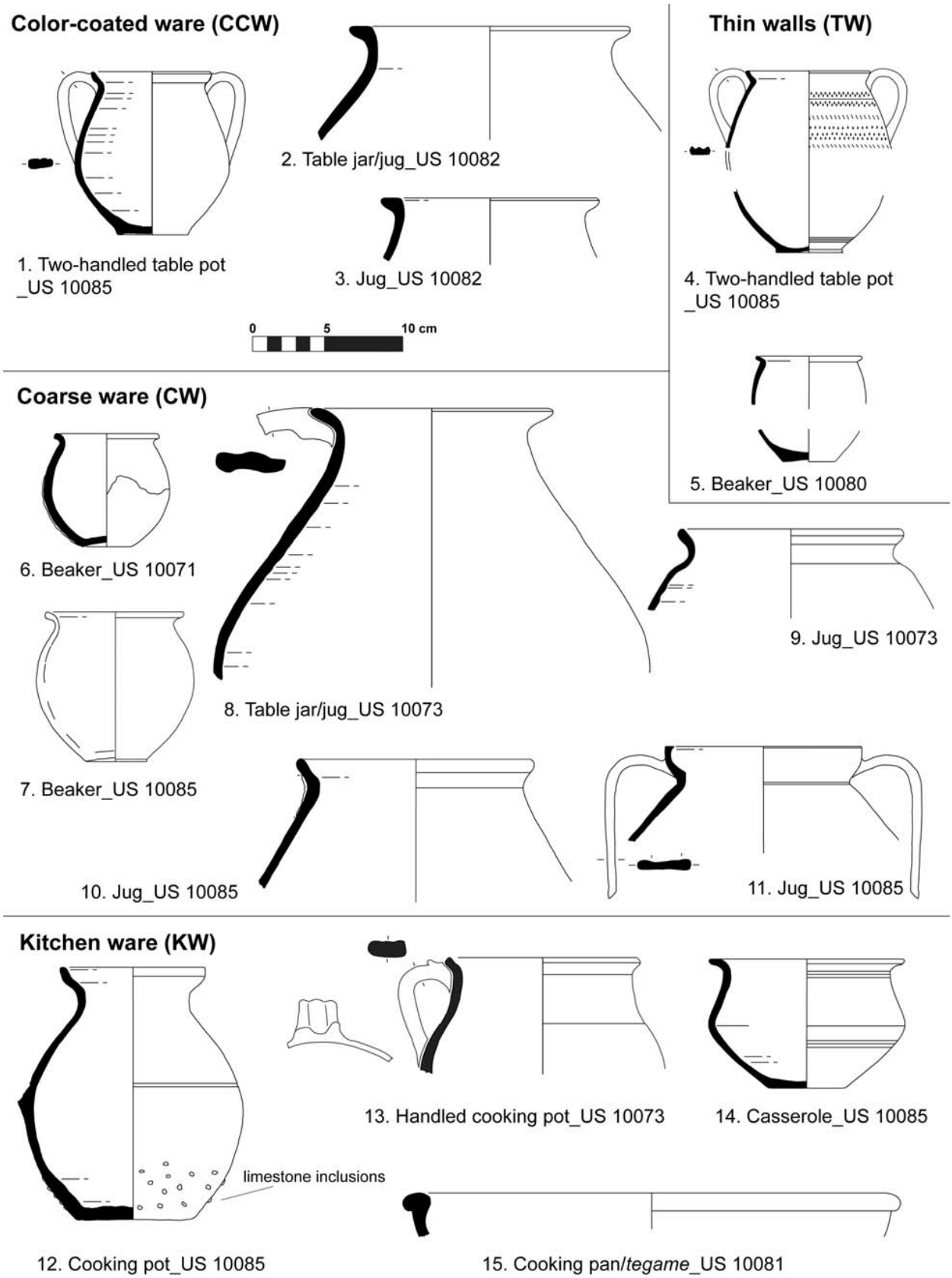


Fig. 10.52 Marzuolo, Phase 2, selection of Color-coated ware (CCW), thin walls (TW), coarse ware (CW) and kitchen ware (KW). Color-coated ware: 1. Two-handled table-pot; 2. Table jar/jug; 3. Jug. Thin Walls: 4. Two-handled table-pot; 5. Beaker. Coarse ware: 6–7. Beakers; 8. Table-jar/jug; 9–11. Jugs. Kitchen ware: 12–13. Cooking pots; 14. Casserole; 15. Cooking pan/*tegame* (EV).

Table 10.6 Marzuolo, Phase 2 amphorae, by type and MNI and % of amphorae (EV).

Amphora type	MNI	% (of Marzuolo Phase 2 amphora recorded)
Local/regional medium-sized wine amphora with band-shaped rim and flat/ring footed base	21	53.8
Camulodunum 184 (Aegean or Asia Minor)	6	15.3
Dressel 5 (Aegean or Asia Minor)	6	15.3
Uncertain Baetican types for fish sauce	2	5.1
Baetican Dressel 9	1	2.5
Portuguese early Dressel 14 *similis*	1	2.5
Campanian Schone VI	1	2.5
Uncertain single-handled type (regional?)	1	2.5
TOTAL	**39**	

Phase 3

The ceramics from this phase come from both Areas I and III (251 MNI). The materials from Area I and Area III, however, exhibit quite different depositional processes: those from Area III relate to the abandonment and collapse of Structure 4. Assemblages from Area I are almost entirely from single-moment fill episodes, in which the voids presented by the Structure 1, the *opus reticulatum* building, were deliberately backfilled. These two areas, and two different depositional processes, yielded not only different levels of preservation, but also significantly different ceramic profiles. We will consider the areas separately first, before considering all the Phase 3 ceramics.

A calculation of EVE for the Area I, 2nd–3rd c. backfill contexts supports the notion that this was a deliberate, single moment of fill, with large pieces deliberately selected to quickly fill the *opus reticulatum* building's rooms (Table 10.7). Estimated Vessel Equivalent measurements provide a proxy for the degree of breakage and, thus, preservation of finds, the higher the percentage, the greater degree of preservation. Assemblages composed of larger portions or complete vessels will yield higher EVE calculations. For Area I, the mean, mode and median EVE for these contexts were 26.16%, 15%, and 7%, respectively, the second highest in the project, pointing to low fracture and high relative fragment size. The EVE calculations for Area III, where the ceramics came from both collapse and use/abandonment levels, are somewhat lower: 20.18% (mean), 10% (median), and 7% (mode). These EVE numbers suggest a modest but important difference in the preservation character of these two Areas, almost certainly a result of different depositional processes.

This deliberate fill may explain another oddity of the Area I ceramics, namely the high quantities of amphorae. Of all the amphorae from Phase 3 contexts, 32 MNI/80% come from the Area I fills, versus only 8 MNI/20% from the Area III assemblages (Table 10.8). Likely deliberately selected as fill material because of their bulky size, amphorae dominate these contexts and are relatively more infrequent in the Area I abandonment contexts. The selective preference for large objects may also explain the relatively low fine ware counts here: only 5 MNI of the 15 MNI of African red slip came from these contexts: as will be discussed below, the amphorae from these same deposits speak to important long-distance trade contexts, including those from Africa, so African goods were certainly arriving at the site. The low numbers of African red slip in Area I is, again, possibly owed to the particular bulky nature of the backfill process.

In general, the proportion of kitchen to dining wares (27.49%:47.01%) returns somewhat to the proportions of Phase 1, with dining wares occupying a somewhat reduced role. Fine wares for dining from this phase are comprised either of African red slip (5.17%) or Color-coated ware imitations. As discussed above, the fills of Structure I, Area I occupation and collapse levels produced only African red slip A (Hayes 6B, Hayes 16) (Fig. 10.54.8, 3) but not

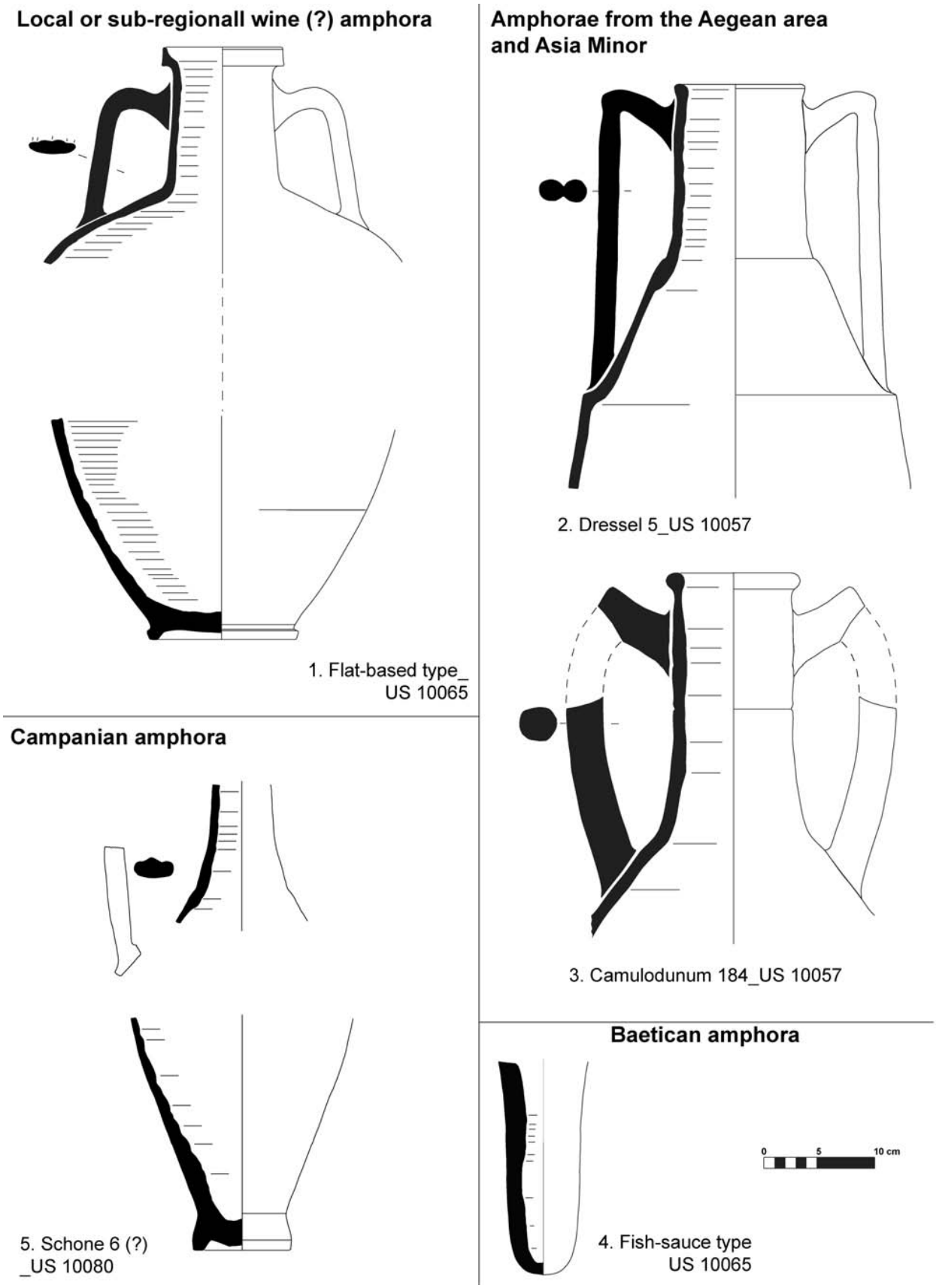


Fig. 10.53 Marzuolo, Phase 2, Sample of local/sub-regional and extra-regional amphorae: Local/sub-regional amphora: 1. Flat-based wine (?) type. Imports from the Aegean and Asia Minor: 2. Dressel 5; 3. Camulodunum 184. Baetican import: 4. Generic fish-sauce type. Campanian import: 5. Possible Schone 6 (EV).

Table 10.7 Marzuolo, EVE calculations, Phase 3, Areas I and III, with other project sites for comparison (EV).

Site	Total MNI for which EVE was calculated	Overall MNI	Mean EVE	Mode EVE	Median EVE
Marzuolo Area I	112 MNI (or 70.44% of the total MNI)	159 MNI	26.16%	7%	15%
Marzuolo Area III	66 MNI (71.73% of the total MNI)	92 MNI	20.18%	7%	10%
San Martino	28 MNI (or 59.5% of the total MNI)	47 MNI	31.75%	7%	15%
Poggio dell'Amore	15 MNI (or 71.4% of the total MNI)	21 MNI	13.80%	7%	7%
Podere Terrato	36 MNI (or 58.06% of the total MNI)	62 MNI	17.94%	7%	10%

Table 10.8 Marzuolo, Phase 3 amphorae, Area I and Area III, by type and MNI and %MNI of amphorae. NB: these do *not* include 2 MNI of residuals (EV).

Amphora type	Marzuolo Area I (32 MNI, 80% of Phase 3 amphorae)	Marzuolo Area III (8 MNI, 20% of Phase 3 amphorae)	% (of Phase 2 amphora recorded)
Africana I B (Tunisia)	0	1	2.5
Leptiminus 1C (Tunisia)	1	0	2.5
Uzita 2 (Tunisia)	1	0	2.5
Dressel 30 (Mauretania)	1	0	2.5
Tripolitana II (Tripolitania)	1	0	2.5
Pelichet 46	0	1	2.5
Dressel 14 (Baetica)	12	2	35.0
Dressel 14 (Lusitania)	4	0	4.0
Beltran 2B (Baetica)	1	0	2.5
Baetican fish-sauce amphora	0	1	2.5
Gauloise 4 (Gaul)	1	0	2.5
Dressel 24 (Asia Minor/Aegean area)	0	1	2.5
Knossos 19 (Aegean area)	2	0	5.0
Camulodunum 184 (Aegean area)	0	1	2.5
Unidentified Eastern Mediterranean/ Aegean amphora	1	0	2.5
Local/regional mid Roman amphora type	6	0	15.0
Residual Dressel 2/4 (central Tyrrhenian)	0	1	2.5
Residual 50–70 AD amphora (local/ regional)	1	0	2.5
Uncertain source	1	1	5.0
TOTAL	**33**	**9**	

*2 MNI residual, of total of 42 amphora MNI in Phase 3 contexts

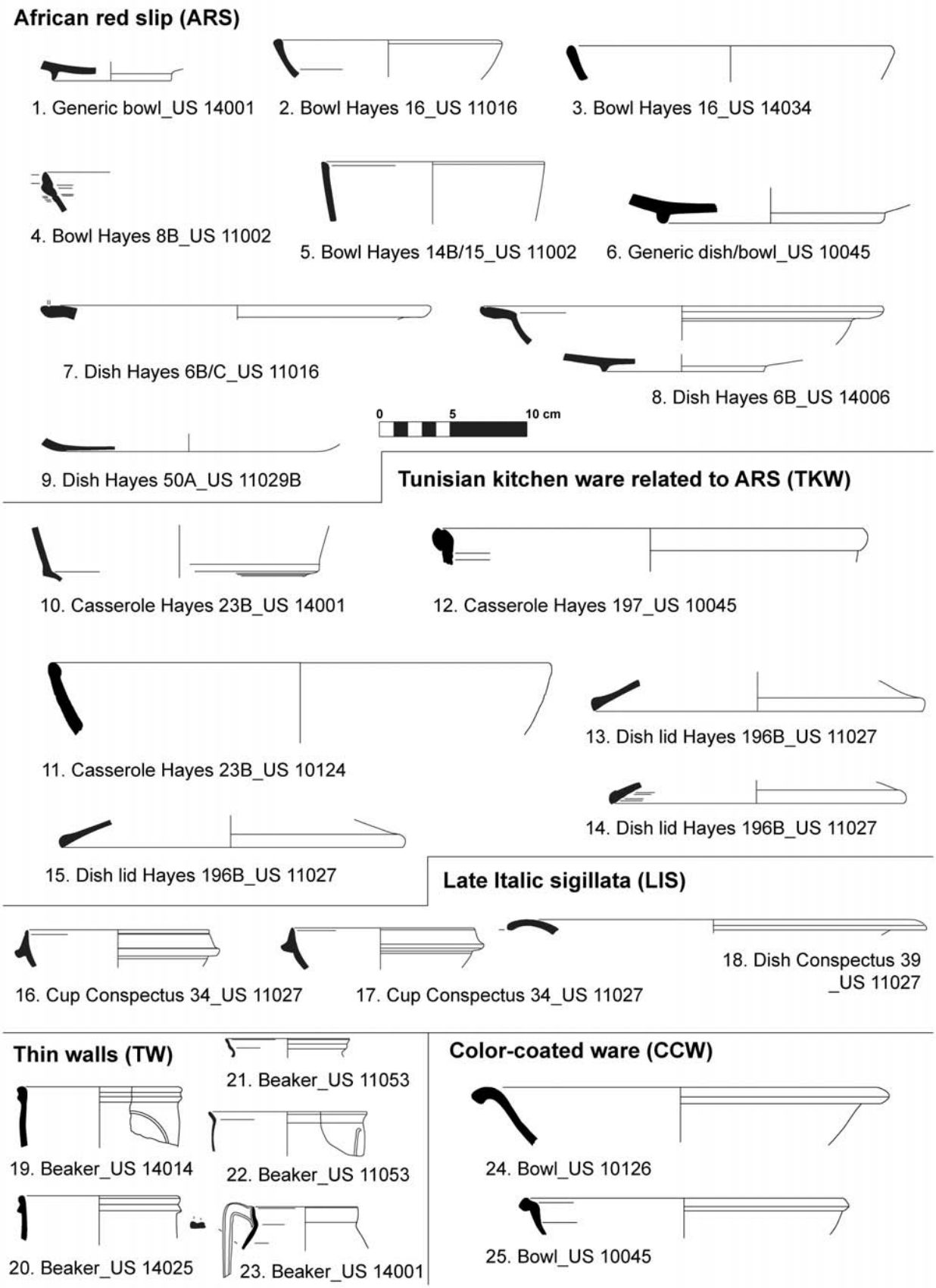


Fig. 10.54 Marzuolo, Phase 3, African red slip and imitations, Color-coated ware and Thin wall wares : African Red Slip (ARS): 1. Generic bowl; 2–3. Bowls Hayes 16; 4. Bowl Hayes 8B; 5. Bowl Hayes 14B/15; 6. Generic bowl/dish; 7–8. Dishes Hayes 6B and 3B/C; 9. Flat-based dish Hayes 50A. Tunisian Kitchen ware related to ARS (TKW): 10–11. Casseroles Hayes 23B: 12. Casserole Hayes 197; 13–15. Dishes/lids Hayes 196B. Thin wall ware (TW): 19–23. Beakers. Color-coated ware (CCW): 24–25. Bowls. (EV).

C, pointing to a *terminus post quem* of these fills in the early 3rd c., while the collapse and abandonment contexts of Area III yielded both African red slip A and C (Hayes 6B or C; Hayes 14B or 15; Hayes 8B; Hayes 50A (3 MNI) (Fig. 10.54.7, 5, 4, 9) pointing generally to an early to mid-3rd c. date. Other than the fine wares, dining wares are dominated by coarse and Color-coated ware jugs (9.56%), jars (2.39%), pots (2.39%), and other closed forms.

Kitchen wares comprise some 27.49% of the assemblage with cooking pots (Fig. 10.55.9) measuring 8.76%. However, unusually for our sites, it is the open form cooking vessels like casseroles (6.37%) and *tegami*/frying pans (5.97%) that dominate the cooking assemblages (Fig. 10.55.10–12). Indeed, these assemblages included some of the few imported Tunisian casseroles (Hayes 197, Hayes 23B) (see Fig. 10. 54.10–12) found in our project sites. Again, it is important to note that the faunal assemblages contained a somewhat higher proportion of subadult and juvenile animals, a trend we have sometimes been able to associate with open-form cooking vessels (see below).

Finally, the Phase 3 amphora provide evidence for the continued and even expanded imported foodstuff connections Marzuolo experienced during the later empire (Table 10.8 and Fig. 10.56). As noted above, these were concentrated in the Area I fills. While the Phase 1 and 2 amphorae were predominately local or regional productions, the Phase 3 specimens come from much further afield. They are dominated by fish-sauce amphorae from the Iberian peninsula, Baetican Dressel 14 and Portuguese Dressel 14 *similis* (Fig. 10.56.1–4). Fish sauce, too, was possibly contained the North-African types Leptiminus 1C and Tripolitana II and the Campanian Schone VI. One Gauloise 4 is also documented; this was also found in the mid-Roman deposit at Case Nuove. Finally 4 MNI wine-amphorae were assigned to local/regional and central Italic sources (10.56.8). The presence of the large Dressel 14 and Dressel 14 *similis* amphorae at an inland site like Marzuolo is significant. These materials were well documented in Roselle (Vaccaro 2011) but, before the excavation at Marzuolo, there was no evidence for their inland circulation. The mid-Roman amphora record from Marzuolo seems to point to the site's persisting role as an inland hub after the cessation of ceramic production and up until the abandonment of the site.

Phase 4

Only a few potsherds belonging to 2 MNI of kitchen ware comprised the medieval ceramics (Fig. 10.57). All derived from the area of the church in Area I. Both are cooking pots: 1 MNI of a rim; 1 MNI a flat base. The most likely date, by comparison with materials from southern Tuscany, is 11th–12th c. AD, and they are particularly are similar to materials from the Romanesque church at Santa Marta.

10.5 Faunal Materials (MM)

As was the case with the ceramics, the faunal materials (Tables 10.9–10.18) showed significant spatial and temporal variation. The results of their analysis are presented here by Phase and Area, concluding with some observations on the collection as a whole.

Phase I

The principal contexts from the 30–10 BC phase come from Area III, from the dumps to the N of Structure 4 (SU 11040, 11043, 11048, and 11012). These were among the richest faunal deposits on the site and in the project as a whole with 25 MNI. The two phases of the dump (i.e., 30 BC and 30–10 BC) are roughly separated in this report. Once deposited in these middens, the disposed faunal materials remained relatively protected from taphonomic agents. Very few bones showed traces of carnivore gnawing, sun bleaching, and other indications of exposure. Thus, rubbish seems to have accumulated fairly quickly, perhaps as a single, mass event, after which it was covered over rapidly to remain protected from rummaging dogs. The dump from the later (30–10 BC) phase appears more protected, while the earlier 30 BC phase from SU 11040, 11043, and 11048 contains a relatively higher frequency of carnivore-gnawed bones. It is possible that this earlier phase accumulated more intermittently, accounting for its more variable taphonomic condition.

All taxa were consumed, as indicated by the high frequency of chop and cut marks across elements, regardless of animal. The incidence of butchery marks on the cattle bones from these contexts is among the highest from across sites in the project. Cleavers were chosen over knives and saws in most cases—but there is nothing remarkable about this choice. Such is

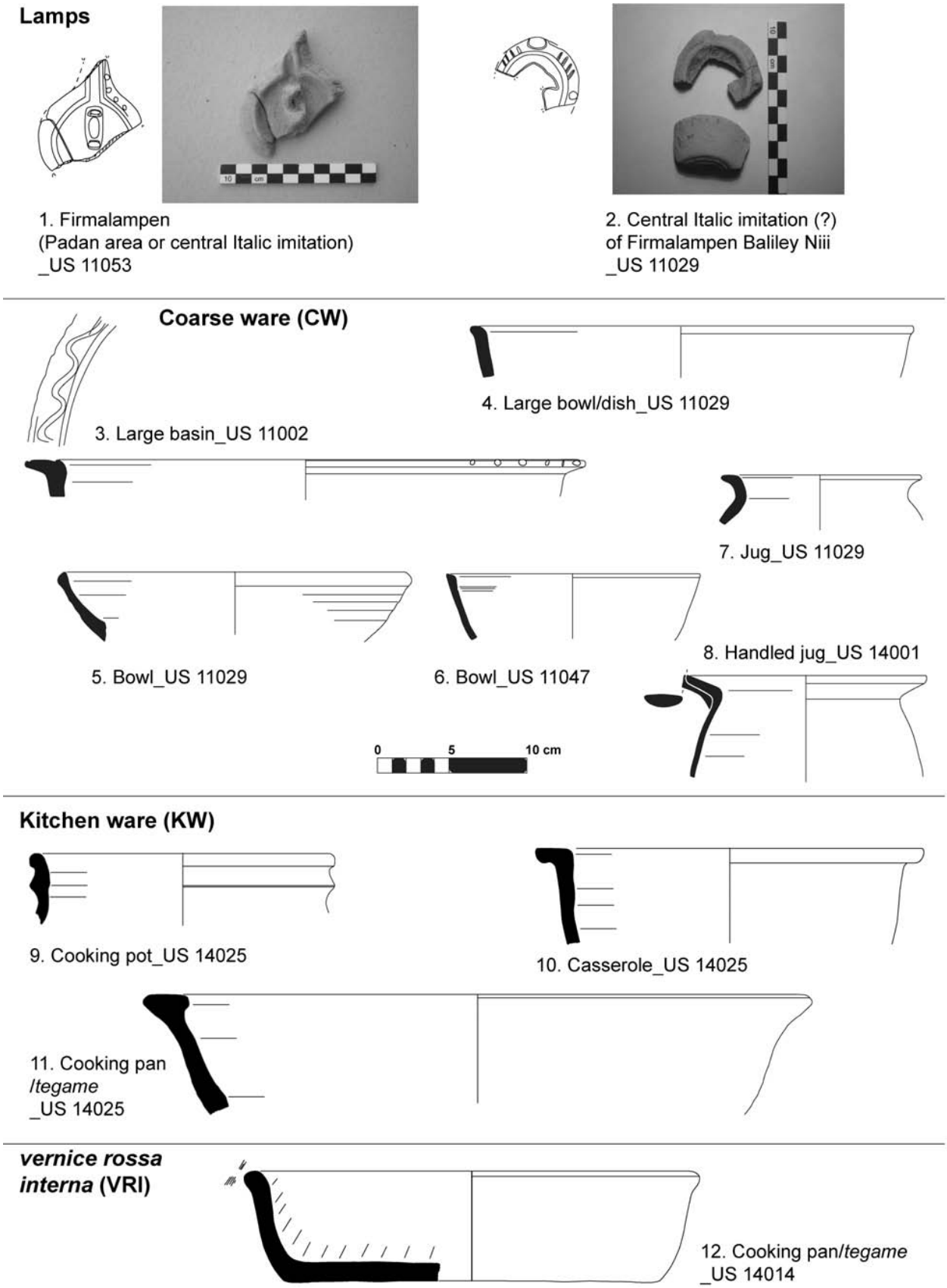


Fig. 10.55 Marzuolo, Phase 3, lamps, coarse wares, kitchen wares. Lamps: 1–2 Firmalampen types (original from the Padan area [?] and possible central Italic imitation). Coarse ware (CW): 3. Large basin; 4. Large bowl/dish; 5–6. Bowls; 7–8. Jugs. Kitchen ware (KW): 9. Cooking pot; 10. Casserole; 11. Cooking pan/*tegame*. *Vernice rossa interna* (VRI): 12. Cooking pan/*tegame* (EV).

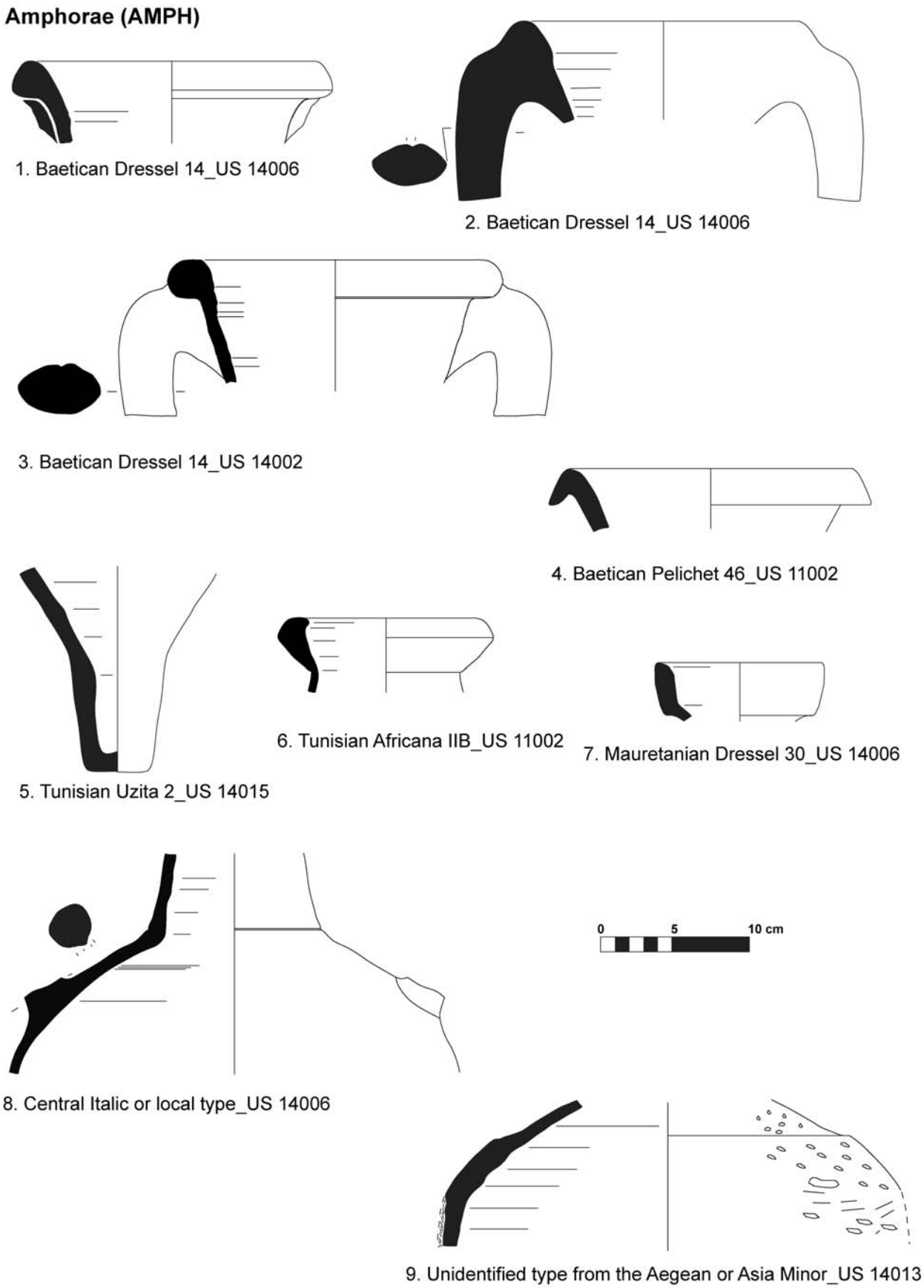


Fig. 10.56 Marzuolo, Phase 3, amphorae (AMPH): 1–3. Baetican Dressel 14; 4. Baetican Dressel 46; 5. Tunisian Uzita 2; 6. Tunisian Africana IIB; 7. Mauretanian Dressel 30; 8. Central Italic or local (wine?) type; 9. Unidentified amphora from the Aegean Sea or Asia Minor (EV).

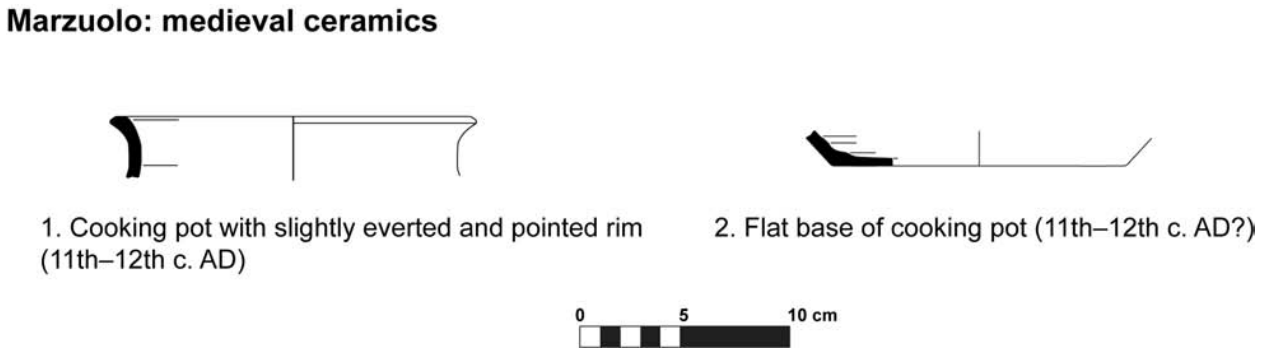


Fig. 10.57 Marzuolo, Phase 4, medieval ceramics.

rather typical of most Roman cattle butchery operations, regardless of their scale.

There is a general balance among skeletal parts (including ribs and vertebrae) for all consumed domestic taxa (i.e., cattle, ovicaprids, and pigs) in these "dump" contests. Such a pattern typically indicates fairly complete carcasses were processed and consumed, with remains from all parts of the skeleton eventually disposed of. In other words, there is no marked import or export of types of cuts (e.g., primary cuts, lower legs, etc.), that can result when various processes to skin, gut, disarticulate, fillet, and cook meat are separated spatially, or where better quality cuts of meat (e.g., rib and vertebral cuts) are removed. This could be indicative of more self-sufficient butchery and consumption, as opposed to significant marketing or commercialization of cuts.

The assemblage as a whole is marked by relatively higher frequency of cattle (101 NISP) versus any other phase at this site, although pigs are still the most numerous (150 NISP). Other animals are comparatively rare in these dumps. Cattle bones are more abundant in the earlier contexts than the later contexts. Age profiles indicate a mix of subadult and adult cattle (both oxen and cows) in the early contexts, with only adult cattle registering in the later levels. The presence of mixed age groups might signify some resident production of cattle, perhaps tied with localized keeping of stock for traction and possibly milking. That so many cattle are in these midden deposits, compared to other parts of the site, might also link with this area of the site serving a larger industrial role. Work and plow cattle, as well as birthing cows, may have been stabled nearby to provide stock as required and to assure new supplies through controlled breeding schemes and management. The proximity of such stabling may account in part for the greater incidence of cattle in this area of the site as opposed to Area I.

Age patterns for the sheep/goat and pigs are fairly consistent with general profiles that register a mixed regime. Adult sheep are represented (likely exploited for their wool, before being slaughtered), but their numbers are fairly balanced by remains of younger lambs, killed for their meat. Most of the pigs are subadults, at their ideal maximum weights, but juveniles are also represented. Demographic patterns for sheep and pigs indicate some level of wealth, as well as some local production and consumption. These are not animals carted or herded in at only specific times, and meat seems to be available to the site residents throughout the year, as opposed to any marked seasonal slaughter or cull. Such a pattern suggests more self-sufficiency in animal resource management.

Phase 2

As noted above, Phase 2 contexts from the 50–70 AD production contexts from entirely from Area I. SU 10033, 10055, and 10085 contained faunal remains. Stratigraphic unit 10033 was a roof collapse, SU 10055 is a possible hearth, immediately beneath this roof collapse, and SU 10085 one of the many burning levels. Materials from SU 10033 and 10055 were fairly similar, both taphonomically and in terms of taxa and elements recorded. A few charred bones were noted from both contexts, but neither yielded burnt bones in frequencies surpassing 5%. If SU 10055 was a hearth for cooking (and the bone remains recovered

Table 10.9 Marzuolo, faunal remains, NISP and MNI values by temporal phase (MM).

	Marzuolo Phase 1			Marzuolo Phase 2			Marzuolo Phase 3			Marzuolo Phase 4		
	NISP	MNI	Wt. (g)	NISP	MNI	Wt. (g)	NISP	MNI	Wt. (g)	NISP	MNI	Wt. (g)
Cattle (*Bos taurus*)	101	7 (2s, 5a)	3484	14	2 (2a)	284	24	2 (1s, 1a)	686	5	1 (a)	113
Sheep/goat (*Ovis aries*/ *Capra hircus*)	59	6 (1j, 1s, 3a)	240	43	4 (1j, 1s, 2a)	91	44	5 (1j, 2s, 2a)	281	15	3 (1s, 2a)	85
Pig (*Sus scrofa* dom.)	150	7 (1j, 2s, 4a)	862	43	3 (1j, 1s, 1a)	270	70	5 (3s, 2a)	364	11	3 (1j, 1s, 1a)	129
Equid (*Equus* sp.)	—	—		—	—		5	3 (3a)	818	1	1 (a)	14
Dog (*Canis familiaris*)	1	1 (a)	4	4	1 (a)	22	5	2 (1s, 1a)	24	8	1 (a)	8
Domestic fowl (*Gallus gallus*)	12	3 (1s, 2a)	15	10	3 (1j, 2a)	11	13	2 (1j, 1a)	16	—	—	
Red deer (*Cervus elaphus*)	4	2 (2a)	106	6	2 (2a)	333	12	2 (1s, 1a)	646	4	1 (a)	377
Wild boar? (*Sus scrofa* fer.)	3	1 (a)	107	—	—		—	—		—	—	
Hare (*Lepus europaeus*)	—	—		1	1 (a)	2	2	1 (a)	4	1	1 (a)	1
Passerine bird	1	1	1	5	1	4	5	1	5	—	—	
Misc. rodent	5		2	1		1	1		1	—		
Fish	4		2	—			1		1	—		
Tortoise (*Testudo* sp.)	2		3	—			2		2	—		
Human (*Homo sapiens*)	—			—			11	2 (2a)	117	3	2 (2a)	23
TOTAL	**342**		**4826**	**127**		**1018**	**195**		**2847**	**48**		**750**

a = adult; s = subadult; j = juvenile

were related to this hearth), then it appears that bone rubbish was not routinely thrown into the fire, nor, for that matter were meat cuts roasted over an open flame. Evidence suggests that boiling or baking bones (in covered pots or in stewed mixtures) was probably the principal method employed.

The collection of bones from contexts SU 10033 and 10055 consists principally of sheep/goat, pig, and domestic fowl bones. Collectively, these taxa typify common food-fare in Roman diets, regardless of social status—rich or poor. The sample is not clearly distinctive in this regard, although the inclusion of passerine bird (i.e., songbird, and only if this bird was consumed) and wild hare remains might link better with a wealthier Roman diet. Among the identified elements, sheep outnumber goats (the latter does not register, but this need not imply it was absent). At least one adult and two subadult sheep are noted, their parts somewhat skewed in favor of dentition and bones from the lower leg. It is possible that some meatier cuts of sheep (that is elements from the ribs, chest, and limbs) were removed off site, or at least outside of Area I. The situation is different for pig, however; bones of the entire pig skeleton are identified—suggestive of all parts of the pig carcass being processed, consumed, and eventually

Table 10.10 Marzuolo, faunal remains, UNID counts by temporal phase (MM).

	Marzuolo Phase 1		Marzuolo Phase 2		Marzuolo Phase 3		Marzuolo Phase 4	
	Count	Weight (g)	Count	Weight (g)	Count	Weight (g)	Count	Weight (g)
MAMMAL								
SMALL								
Rib	1	1	1	1	—	—	—	—
Long bone	1	1	—	—	5	2	—	—
Vertebrae	1	1	—	—	—	—	—	—
Other	—	—	1	1	4	1	—	—
MEDIUM								
Rib	86	183	52	61	56	94	8	22
Long bone	274	661	90	160	145	285	29	74
Vertebrae	54	219	13	29	14	37	3	7
Scapula/Pelvis	21	62	9	12	7	20	1	5
Cranium	37	80	12	8	11	19	4	9
Other	6	34	1	1	2	3	1	1
LARGE								
Rib	40	286	2	23	11	166	1	4
Long bone	141	1423	6	133	44	420	9	109
Vertebrae	66	593	2	44	9	106	2	40
Scapula/Pelvis	13	104	3	36	—	—	—	—
Cranium	4	23	1	5	10	43	2	4
Other	7	38	—	—	4	39	—	—
AVIAN	2	2	4	3	2	2	—	—
TOTAL	**754**	**3711**	**197**	**517**	**324**	**1237**	**60**	**275**

disposed of in this context. Age data for pigs indicates at least one juvenile, one younger individual, and two subadults. This pattern is relatively typical of pig death profiles, but the greater concentration of juveniles and younger piglets in the sample may suggest a wealthier diet.

In addition to this assemblage of probable food remains from contexts SU 10033 and 10055, one curious item was noted—a rather large section of an adult, male, red deer antler. The antler was charred, with parts calcined (fire damage, although it is not certain if it was burnt in the hearth) and extremely fragmentary. Nonetheless, its rather massive size would have been somewhat impressive. Perhaps it was kept as some sort of curio or trophy item. It showed no traces of being worked or of being sawn at its base. It was probably collected in its shed form, as opposed to being removed from a hunted stag.

Stratigraphic unit 10085 was noteworthy, not so much for the number of bones recovered (very few), or for the distribution of taxa and elements (largely dominated by pig, characteristic of most Roman dietary contexts), but for the condition of the sample. All faunal remains from SU 10085 showed evidence of burning; many were calcined, pointing to high temperatures for a prolonged duration. Unfortunately, the type of event that produced this calcination, be this a marked single-event conflagration or repeated burning over an extended period of time, cannot be determined on the basis of the faunal evidence alone; however, if repeated burnings did occur, then at least one of these must have been

Table 10.11 Marzuolo, faunal remains, NISP and MNE frequency of skeletal part categories for cattle, sheep/goat and pig (MM).

		Cattle					Sheep/Goat					Pig				
		n	1°	2°	ext.	head	n	1°	2°	ext.	head	n	1°	2°	ext.	head
Marzuolo Phase 1	NISP	94	35.1	12.8	31.9	20.2	58	2.5	13.8	15.5	65.5	148	9.5	10	15.5	64.9
	MNE	16	37.2	18.8	25	18.8	11	9.1	18.2	27.3	45.5	18	22.2	22.2	22.2	33.3
Maruzolo Phase 2	NISP	14	7.1	14.3	28.6	50	43	18.6	11.6	30.2	39.5	43	23.3	11.6	41.9	23.3
	MNE	5	20	20	20	40	11	18.2	18.2	27.3	36.4	10	20	30	20	30
Marzuolo Phase 3	NISP	24	16.7	4.2	29.2	50	44	22.7	11.4	15.9	50	68	11.8	10.3	36.8	41.2
	MNE	5	20	20	20	40	13	23.1	15.4	23.1	38.5	14	21.4	21.4	21.4	35.7
Marzuolo Phase 4	NISP	5	—	—	40	60	15	13.3	26.7	6.7	53.3	11	45.5	—	36.4	18.2
	MNE	2	—	—	50	50	6	16.7	33.3	16.7	33.3	4	50	—	25	25

1° = primary cut (includes scapula, humerus, pelvis, femur)
2° = secondary cut (includes radius, ulna, tibia, fibula)
ext. = limb extremities (includes metapodials, carpals, tarsals, phalanges)
head = cranium, mandible, all teeth

Table 10.12 Marzuolo, % NISP and MNI of skeletal part categories for cattle, sheep/goat, and pig (MM).

	Marzuolo Phase 1		Marzuolo Phase 2		Marzuolo Phase 3		Marzuolo Phase 4	
	NISP (n=310)	MNI (n=19)	NISP (n=100)	MNI (n=9)	NISP (n=138)	MNI (n=12)	NISP (n=31)	MNI (n=7)
Cattle (*Bos taurus*)	32.6	36.8	14	22.2	17.4	16.7	16.1	14.3
Sheep/goat (*Ovis aries/ Capra hircus*)	19	26.3	43	44.4	31.9	41.7	48.4	42.9
Pig (*Sus scrofa* dom.)	48.4	36.8	43	33.3	50.7	41.7	35.5	42.9

quite dramatic, in order to hit the high temperatures needed to calcine bone.

Overall in Phase 2 contexts: (i) dietary taxa predominate (i.e., pig, sheep/goat, domestic fowl); (ii) ages are skewed to younger taxa among these (indicative perhaps of a "wealthier" diet, as well as localized production of animals within which to select younger animals); (iii) greater representation of wild taxa (again, perhaps a connection to "wealthier" diets); (iv) most parts of the skeleton represented (suggestive, especially in the case of pig, of whole animals butchered, consumed, and disposed of in the local area); (v) a preference for stewing meats (as opposed to roasting—the few pieces that do show traces of charring are due to their being caught in non-cooking fires).

Phase 3

Phase 3 faunal remains derived from three parts of the site: Area I, the fill of the *opus reticulatum* building; Area II, the abandonment of the area, and Area III, the collapse of Structure 4. As these were quite different in both taxa and taphonomy, we have presented each of these areas in some detail (Tables 10.13–10.18).

The fill of the *opus reticulatum* building (Structure 1) in Area I (Tables 10.13–10.14) represent secondary (perhaps tertiary) backfilling of various contexts—much of which probably occurred just before abandonment of the Roman buildings in the area. No single particular context dominates the record. Scattered human remains (from burials around the

Table 10.13 Marzuolo, faunal remains, Phase 3, Area I, NISP and MNI values (MM).

	Marzuolo Area I, Phase 3		
	NISP	MNI	Weight (g)
Cattle (*Bos taurus*)	6	2 (1s, 1a)	211
Sheep/goat (*Ovis aries/ Capra hircus*)	26	4 (1j, 2s, 1a)	148
Pig (*Sus scrofa* dom.)	45	4 (1j, 2s, 1a)	279
Dog (*Canis familiaris*)	1	1 (s)	1
Domestic fowl (*Gallus gallus*)	7	2 (1j, 1a)	8
Red deer (*Cervus elaphus*)	5	2 (1s, 1a)	236
Hare (*Lepus europaeus*)	1	1 (a)	1
Beaver (*Castor fiber*)	1	1	32
Passerine bird	3	1	3
Tortoise (*Testudo* sp.)	1	1	1
TOTAL	**92**		**920**

a = adult; s = subadult; j = juvenile

Table 10.14 Marzuolo, faunal remains, Phase 3, Area I, UNID counts (MM).

	Marzuolo Area I Phase 3	
	Count	Weight (g)
MAMMAL		
SMALL		
Long bone	1	1
MEDIUM		
Rib	29	48
Long bone	63	119
Vertebrae	8	14
Scapula/Pelvis	2	7
Cranium	5	9
LARGE		
Rib	1	3
Long bone	11	96
Vertebrae	4	45
AVIAN	2	2
TOTAL	**126**	**344**

Table 10.15 Marzuolo, faunal remains, Phase 3, Area II, NISP and MNI values (MM).

	Marzuolo Area II, Phase 3		
	NISP	MNI	Weight (g)
Cattle (*Bos taurus*)	8	2 (1s, 1a)	201
Sheep/goat (*Ovis aries/ Capra hircus*)	2	2 (1s, 1a)	6
Pig (*Sus scrofa* dom.)	7	2 (1s, 1a)	38
Red deer (*Cervus elaphus*)	2	1 (a)	131
Tortoise (*Testudo* sp.)	1	1	1
TOTAL	**20**		**377**

a = adult; s = subadult

Table 10.16 Marzuolo, faunal remains, Phase 3, Area II, UNID counts (MM).

	Marzuolo Area II Phase 3	
	Count	Weight (g)
MAMMAL		
MEDIUM		
Rib	4	4
Long bone	33	76
Vertebrae	4	19
Scapula/Pelvis	3	8
Cranium	4	8
LARGE		
Rib	8	75
Long bone	22	159
Vertebrae	1	6
Cranium	10+	43
Other	2	27
TOTAL	**91**	**425**

Table 10.17 Marzuolo, faunal remains, Phase 3, Area III, NISP and MNI values (MM).

	Marzuolo Area III Phase 3	
	NISP	MNI
Cattle (*Bos taurus*)	9	2 (1s, 1a)
Sheep/goat (*Ovis aries*/ *Capra hircus*)	16	3 (1s, 2a)
Pig (*Sus scrofa* dom.)	19	2 (1s, 1a)
Dog (*Canis familiaris*)	4	1 (a)
Equid (*Equus* sp.)	5	2 (2a)
Domestic fowl (*Gallus gallus*)	6	1 (a)
Red deer (*Cervus elaphus*)	4	2 (1s, 1a)
Hare (*Lepus europaeus*)	1	1
Wild boar? (*Sus scrofa* fer.)	—	—
Passerine bird	2	1
Tortoise (*Testudo* sp.)	—	—
Fish	—	—
TOTAL	**66**	**1548**

a = adult; s = subadult

Table 10.18 Marzuolo, faunal remains, Phase 3, Area III, UNID counts (MM).

	Marzuolo Area III Phase 3	
	Count	Weight (g)
MAMMAL		
SMALL		
Long bone	4	1
Other	4	1
MEDIUM		
Rib	24	43
Long bone	49	90
Vertebrae	2	4
Scapula/Pelvis	2	5
Cranium	2	2
Other	2	3
LARGE		
Rib	2	88
Long bone	11	165
Vertebrae	4	55
Scapula/Pelvis	—	—
Cranium	—	—
Other	2	12
AVIAN	—	—
TOTAL	**108**	**469**

church) infiltrate a few of the upper contexts (e.g., SU 14001, 14002, 14004), but the bulk of the deposits are fairly homogeneous in their incorporation of small bits of, largely, pig and sheep/goat bones and teeth, often of younger animals. That this material is food waste seems likely; much of it is butchered, and the relatively high proportion of younger food animals within it may tie to a wealthier diet. However, its scattered nature and high degree of taphonomic breakage attests that it is not a primary deposition, and its relation to overall dietary and economic patterns for this period is difficult to reconstruct: this taphonomy is somewhat different from the ceramic assemblage, composed predominantly of large fragments deposited in a single moment for fill purposes. Taxonomic proportions among the chief domesticates (i.e., cattle, sheep/goat, and pig) align well with the other 2nd–3rd c. AD contexts from across the site and within the wider region as well (i.e., 10–15% cattle, 30–40% sheep/goat, 40–50% pig) to suggest a fairly average and representative pattern.

The Phase 3 finds from Area II (Tables 10.15–10.16) consisted of only a small sample of faunal remains, the bulk from SU 13006 and SU 13016. The materials are disparate, with a mix of small and large fragments, themselves displaying a range of taphonomic markings, and deriving from a host of taxa (cattle, sheep/goat, pig, red deer). Presumably, this represents secondary or tertiary waste that infiltrated various deposits in this area.

Conversely, the Phase 3 finds from Area III (Tables 10.17–10.18) were abundant, deriving from the collapse of Structure 4 in the late 2nd–3rd and even 4th c. AD. These contexts (SU 11029, 11032, 11051, 11053, 12002, and 12003) differed markedly from the Phase 1 dumps in the same Area, both in quantity, taphonomy, and species ratios (see Tables 10.9–10.11). The far fewer remains from these contexts may be expected as most were collapse levels that would contain minimal trash. Incorporated into these levels are chiefly small, fragmented tooth and long bone pieces, predominantly of ovicaprid and pig. Taphonomic markings on these remains indicate greater abrasion, exposure, and other marks typically representative of secondary deposition and trampling. Cattle are rather insignificant in these contexts, in contrast to their numbers in the dump levels discussed above. Finally, these are the only contexts across the entire site in which any significant numbers of equid elements were recovered. Remains of at least one donkey and a probably a mule were identified. Both were older adults. Although the equid materials retrieved are mostly tooth fragments, and the occasional long bone section, their presence in Area III might tie to use of this area for more work-related purposes. In the same manner in which cattle might have been rented, leased, or borrowed for traction duties in antiquity (due to their expense), so might equids. The high percentage of equids and cattle in Area III in both periods may indicate a larger demand for work animals.

Phase 4

Faunal materials from contexts associated with 11th–12 c. AD levels from the church are dominated by remains of sheep (15 NISP), followed by bones of pig (11) and dog (8), with the occasional human element (the latter from disturbed burials in and around the church) (see Tables 10.9–10.11). Available samples consist chiefly of isolated dental fragments, typically those parts of the skeleton that preserve well and can easily infiltrate archaeological deposits. Little can be concluded, but the relative proportions among the consumed taxa fit general patterns for medieval contexts in Italy—that is sheep accounting for about 60–65% of consumed domesticates, followed by pigs and cattle, with some wild game. A mix of all parts of the sheep skeleton is noted, suggestive of local butchery and consumption. Cattle are represented by adults, while sheep materials include various age groups (again perhaps suggestive of localized husbandry ventures). The dog conforms to a medium-sized breed, perhaps one that could assist with herding.

Concluding observations

Correlating faunal data across the various spatial locations and temporal phases noted for Marzuolo presents difficulties. The majority of zooarchaeological materials come from Area III, Phases 1 and 3, from episodes of dumping and abandonment and may have some of the more secure "primary" depositional episodes for bone assemblages. Nevertheless, some measure of diachronic patterns can be gleaned across the entire site, recognizing that even those cases of secondary and tertiary deposition (e.g., Area I, Phase 3) contain faunal materials that originally connected to some apparent use/exploitation/consumption of animals at the site. Thus, even if the overall variety of taxa does not change significantly (i.e., the same types of animals are noted across phases), their relative proportions do vary over time, which in turn may signify general dietary, economic, environmental, and cultural shifts across the ages.

Some similarities do exist across phases. First, in most cases, animals are represented by elements from across the entire skeleton. There is no marked skewing by particular element—for example one animal represented largely by cranial elements, another by upper legs, another by feet, etc.—to conclude any marked import or export of animal parts or cuts of meat. Rather, occupants at Marzuolo appear to have been provided with animals that in turn were butchered and consumed, with the resultant waste disposed of, in the local area.

A second point is that none of the domestic food taxa (i.e., cattle, sheep/goat, pig) is represented exclusively by any single age category. In other words, a mix of young/juvenile through to mature/adult individuals is recorded for most, especially for pigs and sheep/goat. Such variation in age brackets tends to imply local production of animals, with some surplus in stock numbers to allow culling of both young (for meat) and old (as depleted stock) as required. Moreover, sizeable proportions of younger animals can be an indication of dietary wealth, given these animals often might provide what may be deemed "tastier"

cuts of meat. Among the sites excavated as part of the project, Marzuolo shows a relatively higher frequency of juvenile and subadult stock (similar to Casa Nuove Phase 1.2, but different from Pievina and many of the smaller sites). Again, localized husbandry schemes to cull animals of mixed ages, coupled with a level of dietary wealth may explain this pattern.

Arguments for localized production of animals in the Marzuolo area may be further supported through examination of the ratio of sheep to goat, and of the ratio of male to female pigs. Regarding the former, sheep predominate over goats across all temporal phases, by a factor of about 2:1. Such a value marks a cultural choice to favor sheep, probably for their better-quality wool, but not too diminish, markedly, any contribution of goats as well (which produce more milk per animal than do sheep). A balanced sex ratio for pigs (1:1 male:female), moreover, may further substantiate localized, mixed herding ventures as natural pig herds tend to produce equal sex ratios. Again, localized production utilizing mixed husbandry seems to characterize the area.

While a case for localized animal husbandry operations, with keeping of cattle, sheep/goat, and pig (and also domestic fowl it should be added) registers best across the various timeframes represented at Marzuolo, it is difficult to track this neatly. Table 10.12 tracks the relative frequency of cattle, sheep/goat, and pig, by NISP and MNI values, respectively, across temporal phases for the entire site of Marzuolo. With the exception of a high frequency of cattle within Phase 1 deposits, trends among the principal animal taxa at Marzuolo diverge somewhat. For example, NISP frequencies show a ca.10% rise in the frequency of pig between Phases 2 and 3, but corresponding MNI values for the same period register a slight decline. It is difficult to judge, on the basis of this evidence alone, what the "real" trend should be, although there is no doubt that pigs represent a principal source of meat throughout the Roman period. The variation both by phase and area is important, specifically, the case for somewhat higher than expected values of cattle between 30–10 BC in Area III (Table 10.9), and 2nd–3rd c. AD contexts in Area I (Table 10.13). These cases have already been discussed above in relation to spatial patterning, since the predominance of cattle in each is a relatively specific phenomenon, in turn likely related to the special deposits producing these samples (and the cultural and taphonomic factors that shape them). Nevertheless, as regards general dietary trends, the values reported for the phases 50–70 AD, 2nd–3rd c. AD, and 11th–12th c. AD roughly parallel those observed across most Roman and medieval Italy overall—specifically here in the relatively low frequency of cattle (under 15%, by NISP), with elevated frequency values for pigs (ca. 45–55%) in Roman contexts, but a shift to sheep/goat predominance into medieval times (ca. 35–40% sheep/goat in Roman times, moving to ca. 50% in medieval times). In this regard, arguments may be presented that Marzuolo very much follows Roman dietary penchants for pork during the imperial period but intensifies pastoral operations into late antiquity and the Middle Ages. Thus, the site is not exceptional to the general cultural patterns evident for the area, and which are exemplified, as well, among other zooarchaeological samples collected from sites in the Roman Peasant Project. This is not to say Marzuolo is exactly the same—it is not—but the overall trends exhibited as regards contributions of animals to the diet parallel dynamics displayed for the wider region. Where Marzuolo might differ concerns two central aspects: (i) the spatial and temporal proportion and distribution of cattle, especially in 30–10 BC levels; (ii) a relatively higher frequency of younger animals, notably here in Roman contexts (30 BC through to 2nd/3rd c. AD), and especially in Area I.

10.6 Hydrological/Geological Contexts, Land Units, and Land Evaluation (AA)

Upon the western (lower) extremity of the Marzuolo terrace, at an altitude of about 109 m asl, a small well/cistern is located (Fig. 10.58), where, in the summer of 2012, the water level stood at a depth of about 4.60 m below the surface. This is definitely too high a level to be in direct communication with the groundwater of the Orcia River valley, so one has to look for an independent groundwater reservoir. It is probable that the rather permeable terrace deposits collect the surface water from the clayey hills located to the E and S of the middle terrace, which then gains its maximum concentration at its lower extremity. It could well be that originally the groundwater flowed

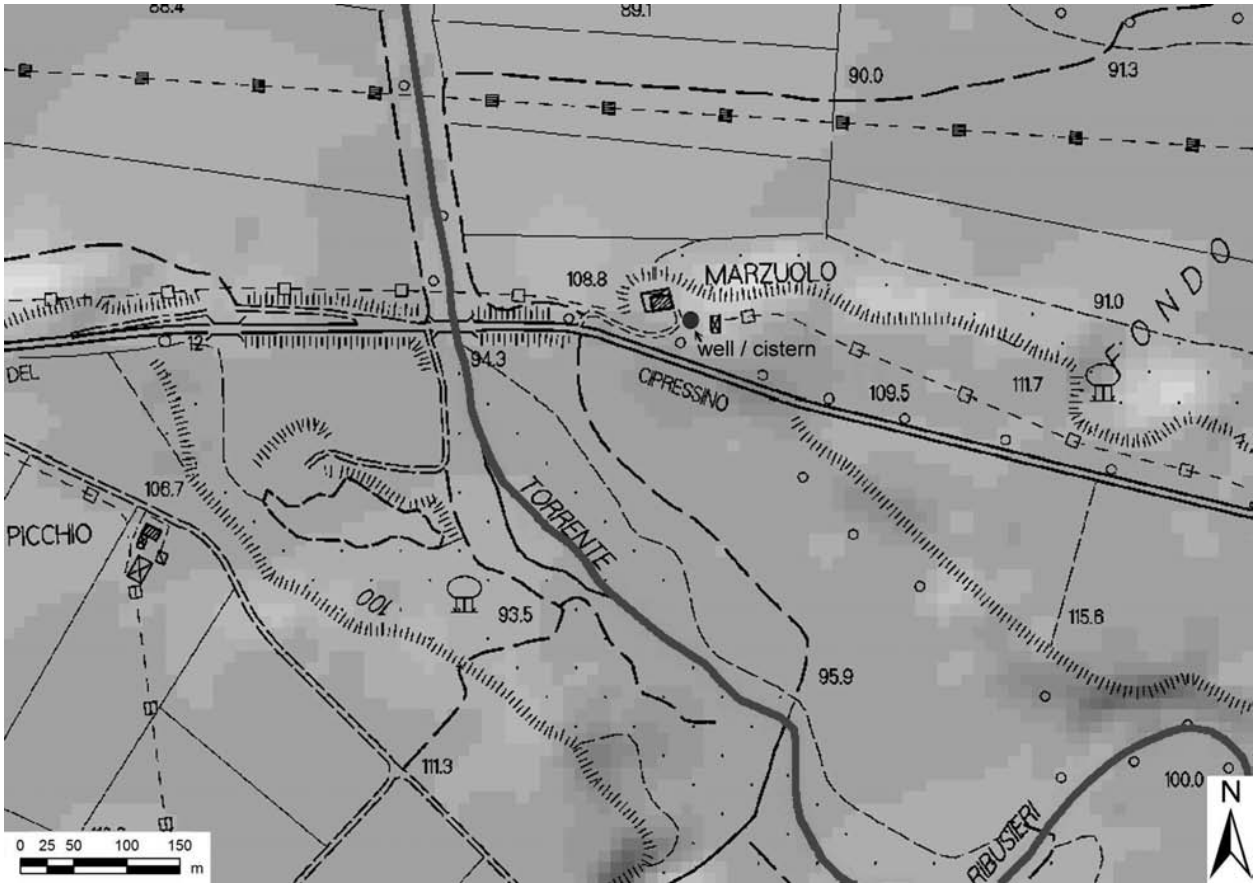


Fig. 10.58 Marzuolo, topographic detail of the site with well/cistern (AA).

spontaneously to the surface creating areas with puddling. The presence of such a local high water table may have favored human settlement and would have been useful in ceramic manufacturing.

What is the origin of the clay and fine sand used for ceramic production at Marzuolo? In Figure 10.59 are mapped possible clay and fine-sand sources. To the E and the S, Upper Miocene–Pliocene clays are widely found (points 3, 4). Also noted are the numerous depressions (1, 2, 7, 8), which eventually might render a finer clay. In all these cases, however, the clay would presumably have to be excavated at some depth from the surface to avoid contamination with organic matter. At points 5 and 6, the clay hills border on the river plain, so exposed sections might provide better accessibility to the pure material. Point 9 is particularly promising as it presents a series of gullies in the Pliocene clays, again presenting potential ease of quarrying. The area, however, is some 9–10 km distant from Marzuolo.

Fine sand can be found in the area, both calcareous and siliceous.[3] Calcareous fine sand outcrops are abundant, in particular in the Miocene sandy formations E of Pievina, corresponding roughly to the land unit **Ks** (Fig. 4.20): these are hilly landscapes, partly rolling, with fine sands, locally with pebbles in the higher parts of the reliefs. Siliceous sand is rare in the province of Grosseto. A large outcrop is visible in the quarry SW of Paganico at Pietratonda, at a distance of about 17 km from Marzuolo. In the past, these fine sands have been used in glass factories and foundries, and both types may have been used in antique pottery production.

From the landscape viewpoint, the area around Marzuolo is at the intersection of several different land units, a feature which also helps explain the species diversity from botanical data (see Color Fig. 10.60). These units include: the extended terraces of the Orcia and Ribusieri river systems, all with a good potential for crop and tree crop cultivation

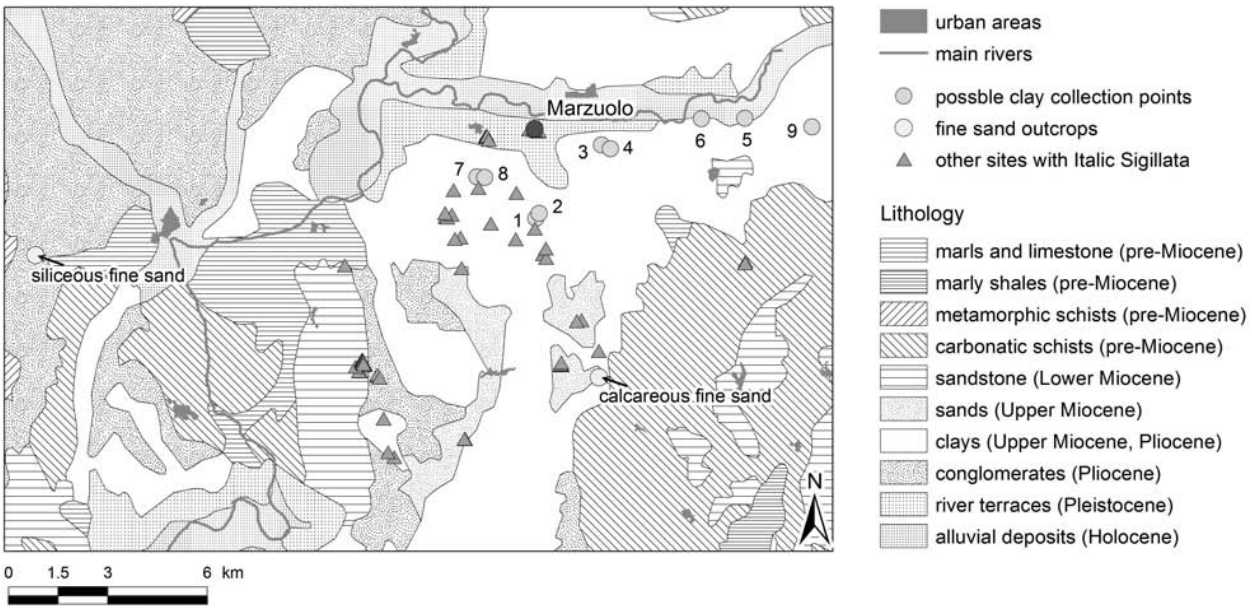


Fig. 10.59 Marzuolo, map of locale: possible clay and fine sand collection points, and other sites with Italic sigillata (not necessarily produced at Marzuolo) (AA).

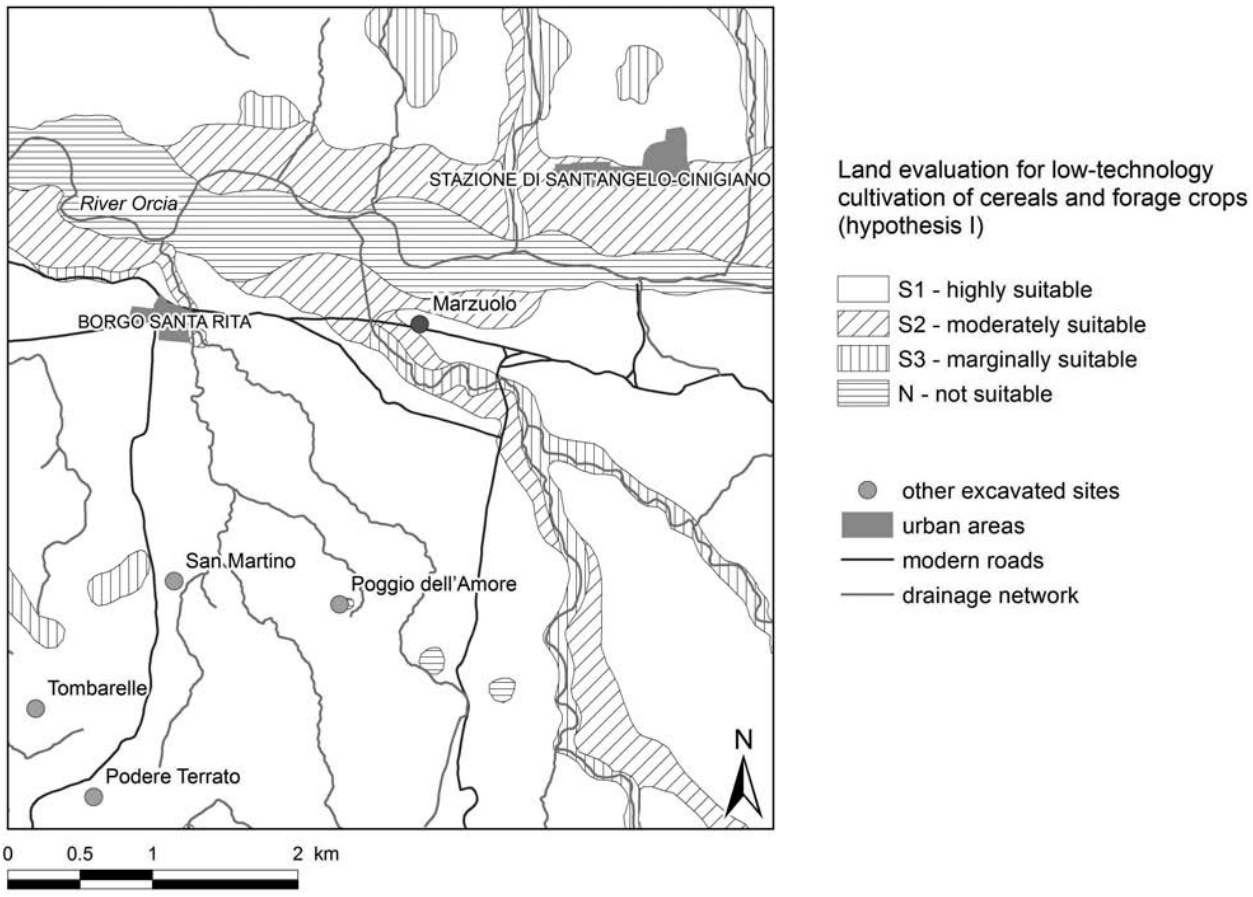


Fig. 10.61 Marzuolo locale, land evaluation map, hypothesis I (AA).

including vines; the active valley floor of the Orcia River, too frequently inundated to be used other than for occasional pasture; and to the S the mainly clayey rolling Mio-Pliocene landscape, rich in natural water outflows, and suitable for crop cultivation (with the limitation of difficult plowing), and more so for pasture. Spots of conglomerate outcrops may have hosted trees and shrubs. Land suitability is similarly diverse with prime land for cereal crops and pasture, plus small areas of woodlands, all in close proximity to the site (Fig. 10.61). It is important to note that lands rated for woods were limited to the conglomerate outcrops and the river margins, seemingly insufficient for ceramic kilns found at the site, suggesting the need for more distant sources of fuel.

10.7 Botanical Materials (AMM, ER, RR)

Marzuolo was the most extensively sampled of the sites in the project (Tables 10.19–10.22). A total of 34 pollen samples (26 of which yielded viable pollen) and 48 macroremain samples were taken, although not all of these yielded remains. Pollen samples were taken from two points each within Areas I and III, representing two Phases of site use: Area I in the S section of Trench 3 (SU 10116; see Fig. 10.21) (Phase 2) and in Room 1, the W section and inside the drain 14045/6 (SU 14001; 14006; 14008; 14046; Phase 3) (see Fig. 10.25); Area III from the collapse inside Structure 4 (Phase 3) and inside the drain (Phase 3), and from SU 11042, the natural geology in this area onto which Structure 4 was built (see Fig. 10.37). Thus, the pollen samples derived *only* from Phase 2 and 3 contexts.

A total of 10,682 pollen grains were counted, ca. 300 p/sample on average for samples from the Area I, Phase 2 and 500 p/sample from the Area I and III Phase 3 samples (Table 10.19). From Phase 2, Area 1, NPP's (380) and microcharcoals (11) were very sparse, while they were more prevalent in Phase 3, Area III (1,768 NPP/g and 1,317 ch/g) and Area I (1,549 NPP/g and 44 ch/g).

Given the large quantities present, their relatively good levels of preservation and the potential importance of wood as fuel in the ceramic firing process, macrocharcoal was also studied. Analysis was conducted with the help of the laboratory GEOLAB at the University of Limoges. The three sections (transversal, tangential, and longitudinal) were examined with a stereomicroscope 100–200x. Small fragments show the presence (use) of branches or trunks of different sizes. Macrocharcoals were analyzed from Phase 1, Area III (ceramic dumps) and Phase 2, Area I (kiln sites).

The 48 macroremain samples were also taken from Areas I and III, from the contexts listed in Table 10.22 Phases 1, 2, and 3. Due to the larger quantities of material in the third fraction (0.25 mm), the samples were split into smaller subsamples, while the material coming from the first and the second fraction was analyzed completely. The total number of remains was low (270 records). Some samples were sterile or only contaminated records were found and in general the remains were poorly preserved, suggesting a strong bias resulting from preservation factors.

The botanical record is both chronologically and spatially uneven across the site: Phase 1 is represented only by a few macroremains and macrocharcoals: no pollen was sampled from the Phase 1 dumps. Phase 2 is represented by three pollen samples, some macroremains and macrocharcoals. While Phase 3, with its rich backfills and abandonment levels, provided the most abundant data for both pollen and macroremains. Spatially, Areas I and III are the best represented while Area II yielded no macroremains and was deemed unsuitable for pollen sampling owing to its shallow stratigraphy.

In order to both address chronological and spatial variation, the botanical materials will be discussed by both Phase and Area although, as will be noted below, the Phase 3 collections are largely homogeneous and will be discussed as a group.

Phase 1

The 30–10 BC period is represented botanically only by a small quantity of macroremains and macrocharcoals, all from the dumps in Area III (Tables 10.21 and 10.22). The macroremains consist of only 14 records (of which 2 were indeterminate species). These include an endocarp of walnut, one of olive, and two grape seeds. Evidence of a nearby garden comes from *Atriplex hortensis* (red beet) from this period.

The few macrocharcoals associated with the 30–10 BC ceramic production dumps in Area III belong

text continues on p. 324

Table 10.19 Marzuolo, pollen analysis, all areas, all phases (AMM/ER).

MARZUOLO (Phases 2 and 3) Percentage pollen spectra														
Sample (PM14 - PM11 - PM10)			***P1***	***P2***	***P3***	***P16***	***P17***	***P18***	***P19***	***P20***	***P21***	***P22***	***P23***	***P24***
Area			Area I/Phase 2			Area I/Phase 3								
Stratigraphic Unit			10116			14046	14001			14006				
Depth - cm			55	62	70		23	26	28	32	38	41	43	46
Pollen concentration (p/g)			**9457**	**9934**	**19516**	**5374**	**8150**	**19224**	**10891**	**25862**	**15713**	**11100**	**14860**	**2288**
ADOXACEAE	*Sambucus*													
ANACARDIACEAE	*Pistacia*	Md		0.6	1.6	0.3			0.7				0.3	
AQUIFOLIACEAE	*Ilex aquifolium*													
BETULACEAE	*Alnus*	Wt	1.2	0.2	0.2	2.3	0.7	0.3		2.0		1.0	0.3	
	Carpinus betulus	Ow				1.0		1.3						1.0
	Corylus	Ow	1.7	1.0	1.8			0.3	0.3	3.0		1.0		
	Ostrya /Carpinus orientalis	Ow										0.7		
CANNABACEAE	*Celtis*					0.7					0.3			
	Humulus													
CISTACEAE	*Helianthemum*		0.8	0.4	0.7			0.3						
CORNACEAE	*Cornus mas*													
CUPRESSACEAE	*Juniperus* type	Md	1.0		0.7									
ERICACEAE	*Erica arborea* cf.	Md	1.5	1.7	2.2	1.7					0.3	1.0	1.3	
FABACEAE	*Ulex* type		0.4											
FAGACEAE	*Castanea*		0.4								0.3	1.0	0.3	
	Fagus													
	Quercus deciduous	Ow	3.3	0.8	1.1	1.7	1.7	5.3	0.7	1.3	2.3	1.0	1.7	2.0
	Quercus ilex type	Md	0.6									1.0	1.0	
GROSSULARIACEAE	*Ribes*		0.2											
JUGLANDACEAE	*Juglans*			0.2	0.5							0.3		1.0
MALVACEAE	*Tilia*	Ow		0.2	1.5			0.3						
OLEACEAE	*Fraxinus ornus*	Ow	0.4											
	Ligustrum vulgare type													
	Olea europaea	Md		0.2		0.3		3.0					0.3	0.3
	Oleaceae indiff.													
	Phillyrea	Md	0.6											
PINACEAE	*Abies*		0.4											
	Picea		0.4			0.3								
	Pinus		1.0	0.2	0.4	5.9		2.0	0.3	1.7	1.0	0.7		1.0
RHAMNACEAE	*Rhamnus*												1.0	
ROSACEAE	*Prunus*			0.2				0.3	0.7	1.3				
	Sorbus												0.3	
SALICACEAE	*Populus*	Wt			0.2		0.3					0.7		
	Salix	Wt	0.2	0.2						0.7	0.3			
TAMARICACEAE	*Tamarix*		1.2	0.4	1.1									
ULMACEAE	*Ulmus*	Ow												
VITACEAE	*Vitis*		0.4	1.0	1.1	0.3	0.7	0.3			0.3			

	P25	P26	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	Mean per phase/area				
			Area III/Phase 3																
	14008		11029		11033	11042	11047			11051			11042		Area I Phase 2	Area I Phase 3	Area III Phase 3	Mean pollen spectrum of Phase 3	Mean pollen spectrum
	54	58	10	20	30	38	10	14	18	23	26	28	33	36					
	7759	**9126**	**3886**	**7897**	**18995**	**10891**	**10746**	**7144**	**12083**	**7857**	**8890**	**6283**	**2854**	**1489**	**12969**	**11850**	**8251**	**9972**	**10318**
					0.2												0.02	0.01	0.01
							0.6		0.2			0.4			0.7	0.1	0.1	0.1	0.2
								0.4									0.04	0.02	0.02
		1.3	0.4	0.8	1.4	0.2	1.0	1.3	0.6		0.2	2.2	0.9	0.3	0.5	0.7	0.8	0.7	0.7
			0.2			0.5	1.0	0.2				0.2				0.3	0.2	0.2	0.2
	0.7	1.7	0.2	1.6		1.4		0.4	0.8	0.2	0.2				1.5	0.6	0.4	0.5	0.6
		0.7		0.2		0.2	0.6					0.8				0.1	0.1	0.1	0.1
				1.0	1.2		1.3	0.4	0.2	0.4	1.3	0.4	0.6			0.1	0.6	0.3	0.3
									0.6								0.0	0.03	0.02
	0.3		0.2	0.4	0.8	0.4	0.8		0.6		0.2		0.3		0.6	0.1	0.3	0.2	0.2
			0.2														0.02	0.01	0.01
															0.6				0.1
			0.4	0.2				0.2	0.4	0.8					1.8	0.4	0.2	0.3	0.5
						0.2									0.1		0.02	0.01	0.02
															0.1	0.2		0.1	0.1
					0.2			0.6	0.4			0.4					0.1	0.1	0.1
	1.3	5.0	3.0	1.6	2.7	1.8	3.0	1.7	2.6	1.9	2.8	1.6	1.1	2.0	1.7	2.2	2.2	2.2	2.1
															0.2	0.2		0.1	0.1
															0.1				0.01
	0.3			1.0	0.4					0.9	0.2	0.2	0.3		0.2	0.2	0.3	0.2	0.2
										0.2		0.2			0.6	0.0	0.03	0.03	0.1
															0.1				0.01
			0.2	2.0		0.4	2.5	0.8	0.2	0.4	0.2	0.6	0.3				0.6	0.3	0.3
			0.4				0.2			0.2	0.4			0.3	0.1	0.4	0.1	0.2	0.2
						0.2											0.01	0.01	0.01
															0.2				0.02
			0.4	1.6	0.8	2.0	1.0			0.4	0.9	0.2			0.1		0.6	0.3	0.3
															0.1	0.0		0.01	0.03
	0.7		3.6	3.8	1.2	0.7	2.3	2.1	3.2	2.1	2.8	2.0	2.3		0.5	1.2	2.2	1.7	1.6
		1.3	0.6											2.0		0.2	0.2	0.2	0.2
		0.3						0.2							0.1	0.2	0.02	0.1	0.1
																0.0		0.01	0.01
			0.4	0.6					0.4	0.6	0.2	0.6		0.3	0.1	0.1	0.3	0.2	0.2
			0.2	0.2	0.2	0.7									0.1	0.1	0.1	0.1	0.1
															0.9				0.1
					0.4	0.4											0.1	0.03	0.03
			0.2												0.8	0.2	0.02	0.1	0.2

Table 10.19 cont'd Marzuolo, pollen analysis, all areas, all phases (AMM/ER).

MARZUOLO (Phases 2 and 3) Percentage pollen spectra														
Sample (PM14 - PM11 - PM10)			***P1***	***P2***	***P3***	***P16***	***P17***	***P18***	***P19***	***P20***	***P21***	***P22***	***P23***	***P24***
Area			Area I/Phase 2			Area I/Phase 3								
Stratigraphic Unit			10116			14046	14001			14006				
Depth - cm			55	62	70		23	26	28	32	38	41	43	46
Pollen concentration (p/g)			**9457**	**9934**	**19516**	**5374**	**8150**	**19224**	**10891**	**25862**	**15713**	**11100**	**14860**	**2288**
ALISMATACEAE	*Sagittaria*	Wh			0.5		0.3	0.3			1.0			
AMARANTHACEAE	*Chenopodium*			1.7	2.0	0.7		0.3	1.6	0.7		3.0	1.7	
AMARYLLIDACEE	*Allium*			0.2	0.7	1.0		0.7					0.7	
APIACEAE	Apiaceae		1.7	0.8	1.8	0.7	1.3	1.0	2.3	5.0		4.0	2.7	0.3
ASTERACEAE	*Ambrosia*													
	Artemisia			0.2							1.0		0.3	0.3
	Aster type	LPPI	10.4	6.1	5.0	4.0	2.7	4.0	5.2	3.7	6.5	3.6	4.0	4.6
	Carduus	LPPI	1.2	1.7		1.3	4.0	0.3	1.6			1.0	0.7	0.7
	Centaurea nigra type	LPPI	6.0	6.5	5.3	2.6	6.3	1.7	3.3	4.3	2.6	2.3	15.0	8.9
	Cichorieae	LPPI	9.2	18.5	13.9	22.8	27.0	19.2	33.4	24.6	19.0	25.8	17.0	18.8
BORAGINACEAE	*Symphytum*			0.4										
BRASSICACEAE	*Brassica* type				2.0	1.3				4.0				
	Brassicaceae indiff.		1.2	3.1			1.3	0.3	2.6		1.3	3.0	1.0	
	Hornungia type					1.0	1.3	0.3						
CAMPANULACEAE	*Campanula*			0.6										0.3
CANNABACEAE	*Cannabis*					0.3						0.3	0.7	
CARYOPHYLLACEAE	Caryophyllaceae		2.9	4.4	5.9	4.3	2.3	3.3			2.3	1.0	0.7	2.0
CISTACEAE	*Cistus*			0.8	0.7									
CONVOLVULACEAE	*Convolvulus*		0.6	0.8	0.9			0.3	2.3					0.3
	Cuscuta europaea type													
CRASSULACEAE	*Sedum*													
CYPERACEAE	Cyperaceae indiff.	(Wh)	2.3	3.4	1.8			2.6		1.7	3.3	0.7	1.0	0.7
	Cyperus	(Wh)						0.7						
	Scirpus	(Wh)		0.8										
DIPSACACEAE	Dipsacaceae indiff.				0.4									
	Scabiosa													
EUPHORBIACEAE	Euphorbiaceae			0.4	1.1									
FABACEAE	*Dorycnium*	le	1.3		1.5		1.3		1.3	1.3				
	Fabaceae indiff.	le				1.7		0.7	2.0		1.0	1.3	1.3	1.0
	Hedysarum	le												
	Lathyrus	le												
	Lotus	le	0.2		0.9	0.3				3.7		0.7		
	Medicago	le	1.3											
	Trifolium type	le		2.5	2.0			0.3			2.6	1.3		
	Trifolium pratense type	le	1.5											
	Vicia	le			0.4							0.3		

P25	*P26*	*P4*	*P5*	*P6*	*P7*	*P8*	*P9*	*P10*	*P11*	*P12*	*P13*	*P14*	*P15*	*Mean per phase/area*				
		Area III/Phase 3																
14008		11029		11033	11042	11047			11051			11042		*Area I Phase 2*	*Area I Phase 3*	*Area III Phase 3*	*Mean pollen spectrum of Phase 3*	*Mean pollen spectrum*
54	58	10	20	30	38	10	14	18	23	26	28	33	36					
7759	**9126**	**3886**	**7897**	**18995**	**10891**	**10746**	**7144**	**12083**	**7857**	**8890**	**6283**	**2854**	**1489**	**12969**	**11850**	**8251**	**9972**	**10318**
										0.2				0.2	0.1	0.02	0.08	0.1
	2.3	3.0	1.8	5.7	2.5	5.0	2.1	4.5	2.6	0.6	2.2	1.4		1.2	0.9	2.6	1.8	1.7
0.3														0.3	0.2		0.1	0.1
1.3	1.7	1.8	0.6	0.8	1.1	2.3	1.7	0.8	0.8		0.6	0.6		1.4	1.8	0.9	1.4	1.4
							0.2		0.6				12.0			1.1	0.6	0.5
1.3	0.7	0.6			0.4	2.1	0.2				0.6		1.1	0.1	0.3	0.4	0.4	0.3
5.0	8.3	4.0	3.8	6.1	3.6	3.0	4.0	4.0	4.0	4.3	4.2	2.9	1.7	7.2	4.7	3.8	4.2	4.6
1.3	2.0	0.6	0.6	0.4	0.4		0.2	0.6	1.9	0.2	0.4	1.1	3.4	1.0	1.2	0.8	1.0	1.0
8.3	6.3	11.1	8.6	5.1	2.1	5.9	6.6	7.3	4.3	3.2	4.0	2.9	0.3	5.9	5.6	5.1	5.4	5.4
25.0	20.9	41.5	41.6	33.4	48.4	42.3	50.2	47.2	45.8	51.9	47.7	55.4	52.6	13.9	23.0	46.5	35.3	32.8
														0.1				0.01
		0.8		2.1	0.5	1.3	0.6	0.8	0.9	0.9				0.7	0.5	0.7	0.6	0.6
					1.2				0.4		0.8			1.4	0.9	0.2	0.5	0.6
															0.2		0.1	0.1
0.3	0.3													0.2	0.1		0.04	0.1
															0.1		0.1	0.1
6.0	2.3	3.6	3.4	3.1	4.1	0.8	0.8	1.4	2.5	1.5	1.4	1.1	3.1	4.4	2.2	2.2	2.2	2.5
		0.4		0.2		0.2	0.4						2.0	0.5		0.3	0.1	0.2
0.7						0.4		0.6			0.2			0.8	0.3	0.1	0.2	0.3
									0.2				0.3			0.04	0.02	0.02
										0.2						0.02	0.01	0.01
1.3	1.3	0.4	1.2	1.2		1.1	0.8	0.6	1.9	0.4	1.0	2.3		2.5	1.1	0.9	1.0	1.2
															0.1		0.03	0.03
				0.8	0.2									0.3		0.1	0.04	0.1
		0.2	0.2		0.9	1.1	0.4	0.2	0.2	0.9		0.9		0.1		0.4	0.2	0.2
		0.2							0.2	0.4						0.1	0.04	0.03
		1.2								0.2				0.5		0.1	0.1	0.1
0.3	1.3	0.2	0.6	0.6	0.2	0.6					0.4			0.9	0.5	0.2	0.4	0.4
1.3	1.7	0.4	0.4	0.2	1.1		0.4	1.6	2.3	2.2	4.0	0.6			1.1	1.1	1.1	1.0
			0.2		0.5	0.2	0.2		0.2				1.7			0.3	0.1	0.1
							0.2					0.9				0.1	0.05	0.04
						0.2								0.4	0.4	0.02	0.2	0.2
														0.4				0.1
	4.0	0.2	1.0	1.6	0.7	1.0	1.5	0.6	0.9	0.4	0.6	1.7		1.5	0.7	0.8	0.8	0.9
												2.6		0.5		0.2	0.1	0.2
														0.1	0.03		0.01	0.03

Table 10.19 cont'd Marzuolo, pollen analysis, all areas, all phases (AMM/ER).

MARZUOLO (Phases 2 and 3) Percentage pollen spectra														
Sample (PM14 - PM11 - PM10)			***P1***	***P2***	***P3***	***P16***	***P17***	***P18***	***P19***	***P20***	***P21***	***P22***	***P23***	***P24***
Area			Area I/Phase 2			Area I/Phase 3								
Stratigraphic Unit			10116			14046	14001			14006				
Depth - cm			55	62	70		23	26	28	32	38	41	43	46
Pollen concentration (p/g)			**9457**	**9934**	**19516**	**5374**	**8150**	**19224**	**10891**	**25862**	**15713**	**11100**	**14860**	**2288**
FUMARIACEAE	*Corydalis*				0.5									
	Fumaria		0.4	0.2	1.3	1.7	1.3	0.7			1.0		0.7	
GERANIACEAE	Geraniaceae				1.1	0.3								
HYPERICACEAE	*Hypericum*						1.3							
HALORAGACEAE	*Myriophyllum*	Wh												
LAMIACEAE	Lamiaceae indiff.			2.7		4.0	4.0	1.0	3.6	1.3	3.3	0.7		1.6
	Mentha type		1.2	1.5	1.3		0.7	0.3	1.0			1.3		0.7
	Salvia				0.7									
LILIACEAE	Liliaceae													
MALVACEAE	*Malva*							0.3						
NYMPHAEACEAE	*Nymphaea alba* type	Wh									0.3			
PAPAVERACEAE	*Papaver*		0.4		0.5		1.0							
PLANTAGINACEAE	*Plantago*		6.7	2.1	1.8	4.0	3.0	6.6	2.0	4.7	7.8	3.3	7.3	7.9
POACEAE	*Avena/Triticum* group	ce	1.0	1.0	1.6	0.7	0.7	5.6	1.3	4.0	2.3	3.3	1.3	2.6
	Cerealia indiff.	ce	2.1	6.1	5.1	0.3	1.0	2.0			1.6	1.3	1.3	4.9
	Hordeum group	ce	2.7	5.9	4.2	2.6	3.3	8.3	2.6	5.6	8.8	3.0	3.7	11.2
	Secale	ce												
	Phragmites australis cf.	Wh						1.7			1.0			
	Poaceae-wild group		13.4	6.9	7.9	13.9	12.0	13.9	17.0	13.6	16.0	13.2	15.7	18.8
POLYGONACEAE	*Polygonum aviculare* type				1.3			0.3				1.0		
	Rumex		1.3											
POTAMOGETONACEAE	*Potamogeton*	Wh						0.3						
RANUNCULACEAE	*Helleborus*													
	Ranunculus type	LPPI	7.1	3.1	3.3	4.3	8.0	2.6	1.0	2.0	1.3	2.3	2.0	1.3
	Thalictrum			2.1	2.0									1.0
ROSACEAE	*Alchemilla*					3.0	1.3							
	Filipendula					0.7						1.0		0.3
	Rosaceae indiff.		0.6	0.2	0.7	1.0		0.3	1.0				1.3	0.7
RUBIACEAE	*Galium* type													
SAXIFRAGACEAE	*Saxifraga*		0.6											
SCROPHULARIACEAE	Scrophulariaceae			0.2										
SOLANACEAE	Solanaceae indiff.					0.7		0.3						0.7
	Solanum nigrum type													
TYPHACEAE	*Typha latifolia* type	Wh											0.7	
URTICACEAE	*Urtica dioica* type		1.5	1.0			1.0		2.6	4.0	2.0	3.0	1.7	
	Urtica cf. *pilulifera*			1.3	5.1	0.7	1.0	0.3					1.0	
Unknown/Indet.			5.9	6.0	1.3	5.9	9.0	5.6	9.5	6.0	9.2	9.9	10.0	5.3

P25	P26	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	Mean per phase/area			Mean pollen spectrum of Phase 3	Mean pollen spectrum
		Area III/Phase 3												Area I Phase 2	Area I Phase 3	Area III Phase 3		
14008		11029		11033	11042	11047			11051			11042						
54	58	10	20	30	38	10	14	18	23	26	28	33	36					
7759	**9126**	**3886**	**7897**	**18995**	**10891**	**10746**	**7144**	**12083**	**7857**	**8890**	**6283**	**2854**	**1489**	**12969**	**11850**	**8251**	**9972**	**10318**
														0.2				0.02
	0.3				0.4	0.2	0.2	0.2		0.4		1.1		0.6	0.5	0.2	0.4	0.4
				0.4		0.2			0.2					0.4	0.03	0.1	0.0	0.1
				0.4											0.1	0.03	0.1	0.1
1.7	1.0	0.6	0.6	1.0	0.4	1.0	0.2	1.2		0.4	0.6		0.6	0.9	2.0	0.5	1.2	1.2
	2.0	0.8	0.8		0.4	0.6		0.4						1.3	0.5	0.2	0.4	0.5
					0.4									0.2		0.03	0.02	0.04
			0.4	0.2			0.2			0.2		0.3				0.1	0.1	0.1
					0.2	0.4	0.2	0.4	0.4	0.4		0.3			0.03	0.2	0.1	0.1
		1.4	1.2		0.2	1.0	1.0	0.2	0.4	0.2	0.6				0.03	0.5	0.3	0.3
													2.6	0.3	0.1	0.2	0.2	0.2
7.0	5.3	1.2	1.4	2.9	2.5	1.5	1.3	1.2	2.0	1.3	1.0	0.6	0.6	3.5	5.4	1.4	3.3	3.3
1.3	1.0		1.0	1.4	1.1	0.4	0.4	0.2	0.4	0.6	0.4	1.7		1.2	2.2	0.6	1.4	1.4
2.7	1.3	1.0	2.0	1.0	3.4	1.3	0.6	0.6	1.3	1.9		1.7	0.6	4.5	1.5	1.3	1.4	1.7
3.3	2.6	0.2	1.0	2.3	0.9	0.8	1.1	0.4	1.3	1.3	2.0	1.1	1.7	4.3	5.0	1.2	3.0	3.2
											0.2					0.02	0.01	0.01
			0.2			0.4	0.4						0.3		0.2	0.1	0.2	0.2
20.7	3.3	2.0	2.6	9.8	3.7	1.5	4.0	4.7	5.8	6.0	5.0	2.6	6.3	9.4	14.4	4.5	9.2	9.2
	1.3					0.4								0.4	0.2	0.03	0.1	0.2
											0.6			0.4		0.05	0.03	0.1
															0.03		0.01	0.01
		0.8			0.5			0.2								0.1	0.1	0.1
0.7	3.3	3.6	1.4	1.4	1.6	0.6	1.3	1.8	1.5	0.9	1.2			4.5	2.6	1.3	1.9	2.2
1.3		1.2	0.6	0.2	1.1		1.5	0.4	0.9	0.9	0.6	1.4		1.4	0.2	0.7	0.5	0.6
															0.4		0.2	0.2
				0.4	1.2	0.6	0.2	0.8			1.2	0.6			0.2	0.4	0.3	0.3
	1.0					0.2	0.4	0.8		0.6	0.2			0.5	0.5	0.2	0.3	0.3
												0.9	0.9			0.1	0.1	0.1
														0.2				0.02
											0.6			0.1		0.05	0.03	0.03
															0.1		0.1	0.1
0.3			0.4			0.4				0.2					0.0	0.1	0.1	0.1
													0.3		0.1	0.02	0.04	0.04
	1.0		0.4	0.4	1.2	1.1	1.5	2.0		0.2				0.8	1.4	0.6	1.0	0.9
		1.0	1.0	0.4			1.7		0.4	0.9			0.3	2.2	0.3	0.5	0.4	0.6
5.0	13.2	5.8	6.0	7.5	4.3	6.1	4.5	4.3	7.8	6.3	8.0	7.7	2.8	4.4	8.1	5.9	6.9	6.6

Table 10.19 cont'd Marzuolo, pollen analysis, all areas, all phases (AMM/ER).

MARZUOLO (Phases 2 and 3) Percentage pollen spectra													
Sample (PM14 - PM11 - PM10)		***P1***	***P2***	***P3***	***P16***	***P17***	***P18***	***P19***	***P20***	***P21***	***P22***	***P23***	***P24***
Area		Area I/Phase 2			Area I/Phase 3								
Stratigraphic Unit		10116			14046	14001			14006				
Depth - cm		55	62	70		23	26	28	32	38	41	43	46
Pollen concentration (p/g)		**9457**	**9934**	**19516**	**5374**	**8150**	**19224**	**10891**	**25862**	**15713**	**11100**	**14860**	**2288**
POLLEN SUM		**521**	**523**	**546**	**303**	**300**	**302**	**305**	**301**	**306**	**302**	**300**	**304**
NUMBER OF TAXA		**57**	**51**	**51**	**39**	**32**	**44**	**25**	**25**	**30**	**37**	**34**	**30**
SUMS													
Arboreal pollen	**AP**	**15.4**	**7.1**	**13.2**	**14.5**	**3.3**	**13.6**	**2.6**	**10.0**	**4.9**	**8.3**	**6.7**	**5.3**
Non Arboreal pollen	**NAP**	**84.6**	**92.9**	**86.8**	**85.5**	**96.7**	**86.4**	**97.4**	**90.1**	**95.1**	**91.7**	**93.3**	**94.7**
Mixed oak wood	**Ow**	**5.4**	**1.9**	**4.4**	**2.6**	**1.7**	**7.3**	**1.0**	**4.3**	**2.3**	**2.6**	**1.7**	**3.0**
Mediterranean trees/ shrubs	**Md**	**3.6**	**2.5**	**4.6**	**2.3**		**3.0**	**0.7**		**0.3**	**2.0**	**3.0**	**0.3**
Wet environments (trees)	Wt	1.3	0.4	0.4	2.3	1.0	0.3		2.7	0.3	1.7	0.3	
Wet environments (herbs)	Wh			0.5		0.3	2.3			2.3		0.7	
Wet environments (Cyperaceae)	(Wh)	2.3	4.2	1.8			3.3		1.7	3.3	0.7	1.0	0.7
Wet environments	**WE**	**3.6**	**4.6**	**2.7**	**2.3**	**1.3**	**6.0**		**4.3**	**5.9**	**2.3**	**2.0**	**0.7**
Cerealia	**ce**	**5.8**	**13.0**	**11.0**	**3.6**	**5.0**	**15.9**	**3.9**	**9.6**	**12.7**	**7.6**	**6.3**	**18.8**
Legumes/pulses (- fodder)	**le**	**4.4**	**2.5**	**4.8**	**2.0**	**1.3**	**1.0**	**3.3**	**5.0**	**3.6**	**3.6**	**1.3**	**1.0**
LPPI (- Cich)		24.6	17.4	13.6	12.2	21.0	8.6	11.1	10.0	10.5	9.3	21.7	15.5
LPPI	**LPPI**	**33.8**	**35.9**	**27.5**	**35.0**	**48.0**	**27.8**	**44.6**	**34.6**	**29.4**	**35.1**	**38.7**	**34.2**

to *Quercus*, a tree which was probably locally available judging from contemporary pollen records of other nearby sites in the project.

Thus, the Phase 1 botanical remains speak very tenuously to local olive and grape production, a possible nearby garden and the use of local woods to fire the Experimental sigillata kilns.

Phase 2

Phase 2 is represented by a series of pollen samples taken from Trench 3, as well as macroremains and macrocharcoals.

Seven pollen samples were taken from the N section of Trench 3 (see Fig. 10.21): two samples from SU 10107, two samples from SU 10109 and 10114, and three samples from SU 10116. The two samples of SU 10107 appeared contaminated from the many rearranged pollen grains, so were not included in the count; the samples from SU 10109 and 10114 were sterile and microcharcoals were extremely abundant, suggesting that pollen was not preserved because it was destroyed by fire. Three samples from SU 10116 were the only ones counted from this Phase.

It should be remembered, that SU 10116 represented the leveling up context upon which the *opus reticulatum* building and its surrounds were built. The date of the construction of this building was never determined: a few contexts suggested a Phase 1 date, while the immediate levels atop SU 10116 dated from Phase 2. On the strength of stratigraphic arguments, a Phase 2 date was favored for this context and, thus, the pollen samples.

P25	P26	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	Mean per phase/area			Mean pollen spectrum of Phase 3	Mean pollen spectrum
		Area III/Phase 3												Area I Phase 2	Area I Phase 3	Area III Phase 3		
14008		11029		11033	11042	11047			11051			11042						
54	58	10	20	30	38	10	14	18	23	26	28	33	36					
7759	9126	3886	7897	18995	10891	10746	7144	12083	7857	8890	6283	2854	1489	12969	11850	8251	9972	10318
300	302	504	500	511	562	525	472	506	532	464	501	350	350	530	302	481	396	411
29	33	50	48	45	48	50	52	44	45	46	43	34	30					
3.3	10.3	10.5	15.0	9.3	8.9	14.1	8.5	10.1	7.9	9.5	9.8	5.7	4.9	11.9	7.5	9.5	8.6	8.9
96.7	89.7	89.5	85.0	90.7	91.1	85.9	91.5	89.9	92.1	90.6	90.2	94.3	95.1	88.1	92.5	90.5	91.4	91.1
2.0	7.3	3.4	3.4	3.1	4.3	4.6	2.3	3.4	2.3	3.0	2.8	1.1	2.0	3.9	3.2	3.0	3.1	3.2
		0.8	0.2			0.8	0.2	0.6	0.9	0.4	0.4		0.3	3.6	1.1	0.4	0.7	1.0
	1.3	1.0	1.6	1.6	0.9	1.0	1.3	1.0	0.6	0.4	2.8	0.9	0.6	0.7	0.9	1.1	1.0	1.0
		1.4	1.4		0.2	1.4	1.4	0.2	0.4	0.4	0.6		0.6	0.2	0.5	0.7	0.6	0.5
1.3	1.3	0.4	1.2	2.0	0.2	1.1	0.8	0.6	1.9	0.4	1.0	2.3		2.8	1.2	1.0	1.1	1.3
1.3	2.6	2.8	4.2	3.5	1.3	3.5	3.5	1.8	2.8	1.3	4.4	3.1	1.1	3.7	2.6	2.8	2.7	2.8
7.3	5.0	1.2	4.0	4.7	5.3	2.5	2.1	1.2	3.0	3.9	2.6	4.6	2.3	9.9	8.7	3.1	5.8	6.3
1.7	7.0	0.8	2.2	2.3	2.5	1.9	2.3	2.2	3.4	2.6	5.0	5.7	1.7	3.9	2.8	2.7	2.8	2.9
15.3	19.9	19.2	14.4	12.9	7.6	9.5	12.1	13.7	11.7	8.7	9.8	6.9	5.4	18.5	14.1	11.0	12.5	13.2
40.3	40.7	60.7	56.0	46.3	56.0	51.8	62.3	60.9	57.5	60.6	57.5	62.3	58.0	32.4	37.1	57.5	47.8	46.0

The concentration of these was ca. 12,969 p/g on average. Samples PM10/1–2 show similar concentrations, 9,695 p/g on average, while sample PM10/3 has a relatively high concentration, 19,516 p/g. The state of preservation of pollen grains was generally good in these samples. Some samples contained significant amount of crumpled pollen, especially Cerealia. Frequent pollen clumps of *Vitis*, Cerealia undiff., *Hordeum* group, and *Aster* type were observed, together with few clumps of *Capparis*, *Centaurea*, Cichorieae, *Plantago*, and unidentified pollen. Sometimes Cerealia were found in the anthers (flower parts). The presence of these pollen clumps suggests the local accumulation of these plants.

Landscape and woodland composition: Pollen diversity was relatively high with 78 pollen taxa in total with 51–58 taxa per sample. Arboreal/Non-Arboreal (AP/NAP) ratios were very low, 12/88, some of the lowest in the project, as they would be throughout the history of the site. The landscape around Marzuolo was largely open with few local woods. Woods are represented by different types: Mediterranean woods, oak woods, possibly mixed conifer-broadleaf, conifer woods, and hygrophilous woods. The broadleaf woods (3.9%) included deciduous *Quercus* associated with *Corylus*. Conifers (0.8%) included *Pinus, Abies*, and *Picea*; the conifer pollen, as well as charcoal, could have arrived from Monte Amiata, either by wind or human transport as cut trees.

Another pollen taxon from afar is *Tamarix* (0.9%), which usually lives on the coasts and in sandy soils: no pollen from tamarisks have been found in other sectors/phases of the site nor in the other sites from the project. This tree was used by Romans for fuel,

text continues on p. 330

Table 10.20 Marzuolo, non-pollen palynomorph and microcharcoal analysis, all areas, all phases (AMM/ER).

MARZUOLO (Phases 2 and 3) Non-Pollen Palynomorphs and Microcharcoals														
Sample (PM14 - PM11 - PM10)		***P1***	***P2***	***P3***	***P16***	***P17***	***P18***	***P19***	***P20***	***P21***	***P22***	***P23***	***P24***	
Area		Area I/Phase 2			Area I/Phase 3									
Stratigraphic Unit		10116			14046	14001			14006					
Depth - cm		55	62	70		23	26	28	32	38	41	43	46	
NON-POLLEN PALYNOMORPHS (concentration NPP/g)														
FUNGI	Ascospores indiff., *Chaetonium*, *Coniochaeta* (inc. *C. linaria*), *Delitschia* type, *Gelasinospora*, *Glomus* (incl. *G. fascicolatum*), *Diporotheca*, *Sordaria* type, Sordariaceae indiff., *Sporormiella*, *Scleroderma*, *Puccinia*, *Tilletia*, *Urocystis*, *Trichocladium*, HdV265, HdV16, HdV35, Fungal spores indiff.	109	19	36	3620	604	2277	1573	1078	3038	503	191	382	
ALGAE	HdV181, HdV182 cf., HdV225, HdV984, *Pseudoschizaea*, *Spirogyra*	490	266	71	0	391	271	524	47	270	56	254	22	
ZOOMICROREMAINS	*Capillaria*, *Dicrocoelium*, Fragments of invertebrates indiff., *Trogoderma*	36	114	0	667	36	163	131	281	68	0	64	11	
Total Concentration of classified NPPs (NPP/g)		**635**	**399**	**107**	**4287**	**1031**	**2711**	**2229**	**1406**	**3375**	**558**	**509**	**416**	
MICROCHARCOALS														
125–200 µm (ch/g)		0	0	0	0	71	54	87	187	68	0	0	0	
201–500 µm (ch/g)		163	0	0	0	0	0	0	0	0	0	0	0	
501–1000 µm (ch/g)		36	0	0	0	0	0	0	0	0	0	0	0	
> 1000 µm (ch/g)					0	0	0	0	0	0	0	0	0	
Total Concentration of microcharcoals (ch/g)		**200**	**0**	**0**	**0**	**71**	**54**	**87**	**187**	**68**	**0**	**0**	**0**	

Table 10.21 Marzuolo, macrocharcoal analysis, all phases (AMM/ER).

MARZUOLO Macrocharcoals									
Sample (PM)		***C1***	***C2***	***C3***	***C4***	***C5***	***C6***	***C7***	***C8***
Stratigraphic Unit		**10033**	**10055**	**11033**	**11048**	**11023**	**11044**	**11055**	**11032**
Chronology		Phase 2	Phase 2	Phase 3	Phase 1	Phase 1	Phase 1	Phase 1	Phase 3
Abies alba			12						
Fagus sylvatica	1*	1							
Pinus sp.				6					
Prunus sp.				1					
Juniperus sp.				6					
Quercus sp.	1*					1			
	2*							1	
UNDETERMINED			1		1		1		1
TOTAL		**1**	**13**	**13**	**1**	**1**	**1**	**1**	**1**

Rings bending: 1* low curve rings; 2* intermediate curve rings

	P25	P26	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15
			Area III/Phase 3											
	14008		11029		11033	11042	11047			11051			11042	
	54	58	10	20	30	38	10	14	18	23	26	28	33	36
	17	64	1742	995	890	1647	4708	1332	716	716	422	652	130	411
	84	287	432	521	334	407	675	696	454	643	211	665	253	380
	0	64	108	158	148	58	164	91	119	88	115	88	8	30
	101	**415**	**2282**	**1674**	**1372**	**2112**	**5547**	**2119**	**1289**	**1447**	**748**	**1405**	**391**	**821**
	0	0	324	932	9943	1337	1453	2588	2675	1710	2295	552	448	471
	0	16	0	0	148	0	0	0	0	29	0	0	8	0
	0	0												
	0	0												
	0	**16**	**324**	**932**	**10091**	**1337**	**1453**	**2588**	**2675**	**1739**	**2295**	**552**	**456**	**471**

Table 10.22 Marzuolo, macroremains analysis, all areas, all phases (AMM/RR).

MARZUOLO Macroremains												
Sample (PM)		***M1***	***M2***	***M3***	***M4***	***M5***	***M6***	***M7***	***M8***	***M9***	***M10***	***M11***
Stratigraphic Unit		**11012**	**11040**	**11043**	**11048**	**11055**	**11062**	**10002**	**10003**	**10012**	**10016**	**10020**
Sediment volume (liters)		25	25	25	25	25	13	25	25	30	25	25
Chronology		Phase 1						Phase 2				
Cornus mas L.	endocarp								1			
Cornus sanguinea L.	endocarp								1			
Corylus avellana L.	nut					1						
Juglans regia L.	endocarp					1						
cf. *Juglans regia*	endocarp											
Olea europaea L.	endocarp											
cf. *Olea europaea*	endocarp		1									
Maloideae undiff.	seed											
Prunus persica (L.) Batsch.	endocarp											
Rubus fruticosus aggr.	endocarp											
Vitis vinifera	grapeseed	2							2	9		
Fruit trees		**2**	**1**			**2**			**4**	**9**		
Hordeum vulgare L.	caryopsis										1	
Legumes undiff.	legume											4
Lens culinaris Medicus	seed											
Triticum aestivum L.	caryopsis											
Triticum dicoccum L.	caryopsis											
Triticum sp.	caryopsis											
Vicia faba L.	legume											
Grains and legumes											**1**	**4**
Atriplex hortensis	achene				1							
Vegetables s.l.					**1**							
Amaranthus blitum/graecizans	achene				2							1
Chenopodium album L.	achene	1							6			1
Chenopodium sp.	achene											
Fallopia convolvulus (L) Á. Löve	achene											
Geranium sp.	fruit						1					
Medicago arabica (L.) Huds.	seed											1
Medicago sp.	seed											
cf. *Myagrum*	silhouette								1			
Picris hieracioides L.	achene											1
Polygonum aviculare group	achene	1							6			16
Trifolium cf. *pratense* L.	seed											
Ruderals s.l.		**2**			**2**		**1**		**13**			**20**
Carex sp.	achene			1								
Wet Environments				**1**								
Sanguisorba minor Scop.	achene											

	M12	*M13*	*M14*	*M15*	*M16*	*M17*	*M18*	*M19*	*M20*	*M21*	*M22*	*M23*	*M24*	*M25*	*M26*	*M27*	*M28*
	10025	**10035**	**10055**	**10065**	**10130**	**10135**	**14008**	**11008**	**11016**	**11023**	**11032**	**11033**	**11037**	**11044**	**11053**	**14010**	**14011**
	25	25	25	25	30	60	25	25	25	25	25	25	25	25	25	25	25
	Phase 2							Phase 3									
					2	1											
																1	
			1		2							1					
											1						
						18											
												1					
													1				
			2			29	4	4		1	1			8			
			3		**4**	**48**	**4**	**4**		**1**	**2**	**2**	**1**	**8**		**1**	
	2	18															
												5					
			1		3												
												1	1				
		7															
		12							1			7					
					1												
	2	**37**	**1**		**4**				**1**			**13**	**1**				
														8			
														8			
								14		2							
															1		
								3		3							
				2													
												1					
	1	1	7	3					1	5				3			
												1					
	1	**1**	**7**	**5**				**17**	**1**	**10**		**2**		**3**	**1**		
			1														

Table 10.22 cont'd Marzuolo, macroremains analysis, all areas, all phases (AMM/RR).

MARZUOLO Macroremains												
Sample (PM)		***M1***	***M2***	***M3***	***M4***	***M5***	***M6***	***M7***	***M8***	***M9***	***M10***	***M11***
Stratigraphic Unit		**11012**	**11040**	**11043**	**11048**	**11055**	**11062**	**10002**	**10003**	**10012**	**10016**	**10020**
Sediment volume (liters)		25	25	25	25	25	13	25	25	30	25	25
Chronology		Phase 1						Phase 2				
Other Environments												
Apiaceae undiff.	mericarp									1		
Bromus sp.	caryopsis											7
Galium sp.	mericarp											
Persicaria sp.	achene											
Poaceae-wild group	caryopsis								1			7
Rumex sp.	achene											
Alia									**1**	**1**		**14**
UNDETERMINED			1				1	1	1	3		
TOTAL		**4**	**2**	**1**	**3**	**2**	**2**	**1**	**19**	**13**	**1**	**38**

CHARRED

perhaps particularly for production processes (cf. Macrob., *Sat*. 16, 22), albeit the archaeological evidence comes predominantly from arid or coastal sites where the tree occurs naturally (Sadori et al. 2010; Veen 2011:225; Bouchaud 2014:601–602; Zerboni et al. 2017; Möller and Reiger 2019).

After the mixed oak woods, Mediterranean vegetation is the most represented in the samples (3.6% on average) particularly *Erica arborea* cf. (1.8%); the presence of this shrub that grows after fires is another indicator that fires were common in this area, possibly caused by the nearby presence of the kilns. Other Mediterranean trees are represented by *Olea, Phillyrea*, and *Pistacia*; together with *Castanea* and *Vitis,* their pollen was found in relatively large and significant quantities.

Wet environments: Wet environments and freshwater habitats were well represented (3.7% on average): trees (*Alnus*, *Salix*, and *Populus*), helophytes (Cyperaceae, which is also the most represented taxon 2.8%) and hydrophytes, water-floating plants (*Nymphaea alba* type*, Sagittaria*). Thus, hygrophilous woods were present in the area as well as standing water, although considerably less abundant than in later phases of the site.

Cereal fields: Cereals are well attested (9.9% on average, percentage similar to that observed in samples from Phase 3, Area I and among the highest of project sites). The pollen types present in the spectra are: *Hordeum* group, *Avena-Triticum* group, and Cerealia undiff., including some folded-crumpled grains that cannot be distinguished and ascribed to the previous groups. This suggests that cereal fields were grown in the vicinity of the site; in addition, cereal pollen clumps (especially clumps of *Hordeum*) were recovered. Cereal caryopses were also found during seed/fruit analyses of samples from Area I (see below).

Cultivated woody plants: Many plants probably used as a food resource have been found. *Vitis* pollen is present in all samples in good quantities (0.8%), testifying that plants lived near the site. Moreover, pollen clumps of *Vitis* have been found in all the samples: this points to on-site deposition of the plants, a hypothesis that unfortunately was not confirmed by the macroremains (see below). The presence of local wine amphorae from this phase (see above) may provide indirect support of local wine productions, as well as recent discovery of possible wine production in the new excavations.

	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26	M27	M28
	10025	10035	10055	10065	10130	10135	14008	11008	11016	11023	11032	11033	11037	11044	11053	14010	14011
	25	25	25	25	30	60	25	25	25	25	25	25	25	25	25	25	25
	Phase 2							Phase 3									
			1														
						3											
	1	15															
					1			1		1				1			
													1				
						3											
						1					1						
	1	**15**			**1**	**7**		**1**		**1**	**1**		**1**	**1**			
	1	25	3						1			6			1		1
	5	**78**	**15**	**5**	**9**	**55**	**4**	**22**	**3**	**12**	**3**	**23**	**3**	**20**	**2**	**1**	**1**

Relatively high quantities of *Corylus* (1.5%) indicates nearby hazelnuts while other trees of economic interest or with edible fruits are present in traces: *Prunus* and *Juglans* in low quantities (ca. 0.1 and 0.2% respectively), while *Pistacia* is well represented (0.7%). These could have lived in mixed oak woods and produced fruits collected in the wild. *Olea* pollen was found in traces (<0.1%), and macroremains are low to absent, suggesting that the olive tree probably was not grown or processed in the area. The traces of *Castanea* pollen seems to indicate an arrival (airborne pollen) from hilly mountains areas; the 0.4% was only found in one sample (P1) where *Ribes* (currant) pollen was also recovered (0.2%): the latter is a shrub living in humid mountain woods and producing edible fruits.

Pasture: LPPI measured 32.4% and while Cichorieae are prevalent (14% on average), this value is the lowest at the site and the lowest value that Cichorieae reach at all sites studied within the project. Combining the significant presence of cereals and *Vitis* and the low value of Cichorieae, it is suggested that grass and grazing land in Phase 2 at Marzuolo was more locally limited than in later periods and in other sites. This may indicate practices more devoted to cultivation than to husbandry.

Of the herbaceous pasture plants, Asteraceae is the most represented including *Aster* type (7.2% on average) and *Centaurea nigra* type (5.9%). In all samples, Poaceae-wild grass group, growing abundantly in dry pastures or grasslands, is well represented (9.4% on average). Among the other herbaceous plants, Ranunculaceae, represented by *Ranunculus* type (4.5%) and *Thalictrum* (1.4%) are well represented, as well as Caryophyllaceae (4.4%) and Fabaceae (4%). All these plants are indicative of wet grassland and could have been also cultivated for fodder. However, the combination of Poaceae, Cichorieae, Cyperaceae, and Plantaginaceae, together with the low quantities of NPPs (coprophilous fungi or parasite eggs, see below) could also indicate a topography dominated by anthropogenic/trampled areas rather than consistent pasture.

Non-pollen palynomorphs: Spores and hyphas of fungi, cysts and other elements of algae, and zoomicroremains were observed in all samples in very low amounts (Table 10.20). All the identified non-pollen biological remains totaled 380.

Fungi (8 morphotypes plus some undifferentiated spores) were ca. 55 NPP/g on average. The most represented were *Coniochaeta* cf., a decomposing

fungus, and *Gelasinospora*, fungus that prefers arid conditions and is frequent in layers containing charcoals.

Algae (3 morphotypes) concentration was very low (276 NPP/g on average). The alga most represented is *Pseudoschizaea* (or *Concentricystes*), an anthropogenic indicator of soil erosion that lives in fresh waters or moist environments in general (Grenfell 1995). Other identified algae belong to HdV181 and HdV182 types.

Zoomicroremains were observed in almost all pollen samples and included parts of small animals (mandibles, paws, and hair) and some invertebrate organisms, always in very small quantities.

Microcharcoal particles: Microscopical particles of charcoals >125 μm, that are indicative of local fires, are present only in sample PM10/1, which contains 11 fragments (Table 10.20).

Macrocharcoals: From the Area I production area contexts (SU 10033) came the largest charcoal fragments (Table 10.21), beech (*Fagus,* made of 11 small fragments belonging to one piece), while the other fragments, taken from the adjacent hearth SU 10055, derives from fir (*Abies*). Only fir is also tentatively represented in the contemporary pollen spectra. In general, beech and fir would not be found in this area, but rather some 10 km to the SE on the slopes of Monte Amiata. Although some recent work has suggested that both species may have grown at lower altitudes during the Roman period (Di Pasquale and Terzani 2006; Di Pasquale et al. 2014b), the closest associated pollen cores from near Grosetto detected neither beech nor fir (Biserni and van Geel 2005), while tiny quantities of both species are found in other project sites.

Macroremains: From the Phase 2, 50–70 AD ceramic production areas in Area I comes important records of cereals (Table 10.22), including *Hordeum vulgare* and *Triticum* (in some examples further attributable to *dicoccum* and *aestivum*). Seeds were found both whole and broken, but the small quantities do not permit further conclusions about their transport to or processing at the site. The combined presence of cereals and legumes (*Lens culinaris*) from this period may again point very tentatively towards grain/legume rotation and echoes their pairing in the later pollen spectra. Also in this period were a notable number of *Polygonum aviculare* group, which include herbaceous plants that grow at the edge of roads or paths and areas with high foot traffic, as well as ditches and field walls. These plants tentatively support the above hypothesis of grassy areas principally produced by human trampled areas. Interestingly, the only relatively high number of records, coming from SU 10135, consists of seeds from two economic fruit trees (*Vitis vinifera* and Maloideae), which were part of the agrarian landscape.

Phase 3

Phase 3 pollen was taken from both Area I (the backfills of Room 1 and the fill of the drain) (see Fig. 10.25) and Area III (collapse of Structure 4) (see Fig. 10.37). These samples will be discussed both separately and as a group.

Area I

All samples were taken from a section inside the late 2nd to early 3rd c. fill of the *opus reticulatum* building (SU 14001, 14006, 14008) plus inside the pipe in Room 1 (see Fig. 10.25). As a possible fill moment, the pollen from Area I should be treated with caution: if these contexts constituted a deliberate fill moment, the soil, and thus the pollen, would have been brought from other contexts not necessarily representative of the plant landscapes at the time. The strong similarities with certain aspects of the pollen spectra from Area III, which shares the same chronology and represents a gradual abandonment, the absence of reworked pollen, and the total absence of any residual ceramic materials in this fill suggests that the Area I pollen might be partially representative of late 2nd–3rd c. landscapes. In other instances, particularly in its high cereal and low pasture content with significant quantities of NPPs, Area I looks quite distinct from Area III.

The concentration of these samples was relatively high (11,850 p/g on average), one-third higher than those found in Area III and ranged from 25,862 p/g (sample P20; SU 14006) to 2,288 p/g (sample P24; SU 14006) (Table 10.19). The state of preservation of pollen grains was generally very good (better than that found in Area III). Sample P16/SU 14046, taken from the pipe, is the only sample where secondary pollen was found: this is probably due to the presence of water containing these grains.

Landscape and woodland composition: 74 taxa were found in Area I, a lower quantity and diversity than Area III. The AP/NAP ratio is very low, 8/92 on average, similar to Area III and to the Phase 2 deposits discussed above. These are the lowest ratios found in the project area, again suggesting the area around Marzuolo continued to have very little tree cover.

As with the other sites in the project Marzuolo revealed a mixed woodland, here with a slight domination of the deciduous oaks (*Quercus* = 2.2%) over mixed woods (*Pinus* = 1.2%). Higher numbers of *Pinus* are found in the channel sample (6%). Mediterranean vegetation is represented by *Olea*, *Pistacia*, *Erica arborea* cf. (1% on average). Hygrophilous woods are represented by *Salix*, *Populus*, and *Alnus* (1% on average).

Wet environments: As in the previous phase, wet environments and freshwater habitats are well represented (2.6% versus 3.7%). There is a diversified association of plants: trees (*Alnus*, *Salix*, and *Populus*), helophytes (Cyperaceae, *Phragmites australis* cf., *Typha latifolia* type) and hydrophytes, water-floating plants (*Lemna*, *Nymphaea alba* type, *Sagittaria*).

Cereal fields: As with the preceding Phase 2, cereal pollen is significant and present in all samples reaching high values (8.7% on average, up to 18.8% in P24). Various cereals were cultivated, represented in the spectra by *Hordeum* group, *Avena-Triticum* group and Cerealia indiff. The weed, *Papaver*, found in one sample, also supports the local presence of fields. These high values in comparison with considerably lower values in the nearby Area III may be a result of fills drawn from cereal-concentrated soils. That these soils contain no residual ceramics suggest that cereal production continued in this period, but we cannot discount the possibility that these fills may overrepresent the phenomenon. The Area III samples (see below) are probably more representative.

Cultivated Woody Plants: *Olea* is present in four samples and reached a high value (3%) in P18—a significant increase compared to the previous phase. Wild plants with fruits probably collected for food, such as *Corylus*, *Prunus*, and possibly *Pistacia*, could have lived in mixed woods. *Vitis* (0.2%) is still relatively common suggesting that plants lived near the site. This plant was also found as pips. Taken together with local wine amphorae found in this deposit, this may suggest (continued?) wine production here or nearby.

Pastures and fodder: The LPPI for Area I is 37.1%, a bit higher compared with Phase 2/Area I (32.4%), but almost half of that found in the Area III (57.5%) and one of the lowest in the project area. This sum includes Asteroideae (including *Aster* type, *Centaurea nigra* type, *Carduus*), Cichorieae and *Ranunculus* type. As always, Cichorieae are the main component of this category (23% on average). Legumes are various (*Dorycnium*, *Lotus*, *Trifolium* type, and *Vicia*); they are low (2.8%) but significant as they are usually underrepresented; other herbs common in pastures or in abandoned fields are Poaceae-wild group (14.4% on average), and Apiaceae, Brassicaceae, and Caryophyllaceae (ca. 2% each, on average). As pasture and cereals exist in opposing relationship with one another, these very low pasture numbers may reflect the same biases in these fill-based samples as did the high cereal numbers. Again, for a better reflection of the plant landscape in this phase, the numbers from Area III are probably more reliable.

Non-pollen palynomorphs (Table 10.20): Spores and hyphas of fungi, cysts and other elements of algae, and zoomicroremains were observed in all samples in good quantities. All the identified non-pollen biological remains totaled 1,549.

Fungi (14 morphotypes plus some undifferentiated spores) were ca. 1,213 NPP/g on average. The most represented are ascospores, and *Sordaria* and *Sporormiella* that are coprophilous fungi growing on droppings and indicating the presence of herbivores. *Scleroderma* is important in the samples, being a genus frequently developing colonies on decaying leaves of deciduous forests. Of interest in Area I is the presence of *Puccinia* and *Tilletia* that can be parasitic fungi for cereals.

Algae (5 morphotypes) concentration was very low (201 NPP/g on average). The most represented alga is *Pseudoschizaea* (or *Concentricystes*), an indicator of soil erosion that lives in fresh waters or moist environments in general (Grenfell 1995). Other identified algae belong to HdV181, HdV182, HdV225, and HdV984 types, they are considered to be living in shallow stagnant water.

Zoomicroremains were observed in almost all samples as small mandibles, paws, and hair, always in very small quantities.

Microcharcoal particles: Microscopical particles of charcoals >125 μm, that are indicative of local fires, are present only in six samples (Table 10.20), in low concentration (44 ch/g on average).

Macroremains: Only one endocarp of cf. *Juglans regia* was found in Phase 3, Area 1 (Table 10.22). The rest of the sampled deposits contained no macroremains.

Area III

All samples were taken from two areas, both contexts relating to the collapse and abandonment of Structure 4 in the late 2nd/early 3rd c. AD (see Fig. 10.37).

Samples taken from the northern core show higher concentration and better pollen preservation than those taken from the southern core (Table 10.19). Concentration is ca. 8,251 p/g on average, ranging from P6 (SU 11033) with 18,995 p/g to P4/SU 11029 and P14–P15/SU 11042 (natural geology) with less than 4,000 p/g. The state of preservation of pollen grains was generally good. However, pollen from SU 11042 was badly preserved with many grains crumpled with rearranged and thinned exines. In the samples P8–10/SU 11047 (roof collapse) here are secondary pollen grains represented by *Pinus*. Pollen clumps (one or more mixed types) of Cichorieae and Apiaceae are abundant in all samples, indicating pollen which fell naturally on the site or was transported there by animal feces. Again, this indicates the greater general reliability of these samples as a reflection of the Phase 3 landscape versus those in Area I.

Landscape and woodland composition: Area III samples included 94 pollen taxa, somewhat more than in Area I, with the number of taxa ranging from 30 to 52. As in Area I, AP/NAP ratios were particularly low, 10/90 on average, again suggesting that forest cover was scanty or virtually absent. This seems especially evident in the *pre*-site, P14–P15 samples where AP is only 5%. It should be considered that as Structure 2 was a closed structure, the low AP values may also be a result of differential pollen transport.

As in Area I, woodland was mixed, here with the same presence of pines and oaks (2.2% each). Mediterranean vegetation (0.4%) is represented by *Olea, Pistacia*, and *Erica arborea* cf., with several shrubs of *Helianthemum, Cistus*, and *Ligustrum* species; again, these percentages are low, suggesting this type of vegetation was not near the site. Hygrophilous woods are represented by *Salix* (0.1%), *Populus* (0.3%), and *Alnus* (0.8%). Wild plants probably used as a food resource included C*orylus, Cornus mas, Pistacia, Sambucus*, and *Prunus*, and could have lived in the mixed oak woods.

Wet environments: Wet environments and freshwater habitats are similarly represented as Area I (2.8% on average versus 2.6%): trees (*Alnus, Salix*, and *Populus*), helophytes (Cyperaceae*, Myriophyllum, Phragmites australis* cf.*, Typha latifolia* type) and hydrophytes, water-floating plants (*Lemna, Nymphaea alba* type*, Sagittaria*) were all present albeit in lower quantities. This may represent the permanence of water places near the site and reflect the somewhat greater distance between Area III and the valley floor.

Cereal fields: One of the most important differences from Area I is the considerably lower quantity of cereals—only 3.1% on average. It would appear that cereals were either more proximate to Area I in this period or preferentially deposited in its fill. Again, different cereals were cultivated, represented in the spectra by *Hordeum* group*, Avena-Triticum* group, and *Secale*.

Cultivated woody plants: In distinction from Area I, *Olea* pollen (0.1%) was found, both in pollen analyses (in five samples) and in the seed/fruit analysis (see below), but in very low quantities. As in both Area I and the preceding Phase 2, *Vitis*, was found in one sample of the channel suggesting it was possibly grown near the site.

The spectra also contain a number of trees/shrubs that produce edible fruits, probably collected in the wild, such as *Corylus, Juglans*, *Prunus*, and other Rosaceae. Rosaceae have an underrepresented pollen because they are entomophilous plants, and their pollen here is highly indicative of the local presence of trees.

Pastures and fodder: The LPPI in Area III was 57.5% on average, among the highest of the sites examined by the project and in sharp distinction from the contemporary deposits in Area I. This sum includes the usual Asteroideae, Cichorieae, and *Ranunculus* type (including some *Ranunculus parviflorus*). Cichorieae, were, as always, the main component of this category (47% on average). Fabaceae (2.7%) were represented by pollen of *Dorycnium, Hedysarum, Lathyrus, Lotus, Trifolium* type and *Trifolium pratense, Ulex* type, and Fabaceae indiff. Together with part of the Poaceae-wild group, it includes species that may be cultivated for fodder. As for Area I, legumes/pulses and fodder accounted for 2.7% of the spectrum. Other herbs are common in pastures or in

abandoned fields and can be browsed (Apiaceae undiff., Brassicaceae, Caryophyllaceae).

Non-pollen palynomorphs (Table 10.20): Spores and hyphas of fungi, cysts and other elements of algae, and zoomicroremains (including eggs of parasites) were observed in all samples, although were not particularly concentrated. All identified non-pollen biological remains totaled 21,208.

Fungi (16 morphotypes plus some undifferentiated spores) amounted to ca. 1,197 NPP/g on average, with good variability. The most represented are Sordariaceae undiff. (coprophilous fungi) and *Chaetomium*, an important indicator of fire. Moreover, in almost all samples there are *Coniochaeta linaria* that lives on decomposed wood and *Sporormiella*, another coprophilous fungus. Of interest is the presence of *Tilletia*, a pathogen of the cereal plants, present in almost all the samples, and *Glomus* and *Scleroderma,* which are indicators of eroded soils.

Algae (11 morphotypes) appear in low concentrations (473 NPP/g on average). All samples contain the *Pseudoschizaea* (or *Concentricystes*) that is the most represented alga; it is an anthropogenic indicator of soil erosion, living in fresh water or moist environments in general. HdV182 and HdV984 are represented in almost all samples. The other algal remains are scattered in the samples.

Zoomicroremains (9 morphotypes) were scarce (98 NPP/g on average) and included parts of animals (mandibles, paws, and hair) and some invertebrate organisms.

Some parasite eggs of *Trichuris* and *Dicrocoelium* were observed, the latter of which includes roundworms and parasites of domestic animals and rodents, while the larvae of *Trogoderma* may cause damage to stored food.

Microcharcoals (Table 10.20): Microscopic particles of charcoals >125 μm, indicative of local fires, are present in all samples with a good concentration: 1,317 ch/g on average. There are also charcoals >200 μm, 744 ch/g on average.

Macrocharcoals (Table 10.21): From Area III, the macrocharcoals associated with the 2nd–3rd c. roof collapse belong to conifers including *Pinus* and *Juniperus*, as well as *Prunus* and *Quercus.* In the case of the latter, these match well with the contemporary pollen evidence suggesting patches of mixed forest with oaks and pines, probably some distance from the site.

Macroremains (Table 10.22): In the 2nd–3rd c. remains, cereals as caryopsis of *Triticum* are again present in small quantities, as well as legumes. A few olive pips were recorded, as well as 14 grape pips. Traces of *Juglans regia* and an endocarp of *Prunus persica* indicate edible fruits consumed on site, while 16 achene of *Amaranthus blitum* (Purple amaranth) and 8 achene of *Atriplex hortensis* (red beet) suggest local vegetable production.

Discussion of Phase 3 Botanical Remains

Taken as a whole the Phase 3 botanical remains from Area I and III are broadly comparable. Percentages of oaks (2.2%) and mixed oak woods (3%) are similar in the two areas. The forest cover is negligible (8–10%, respectively). Among the wild anthropogenic indicators, some low-producer entomophilous such as *Centaurea nigra* type (ca. 6–5%) and *Aster* type (ca. 5–4%) have similar percentages—a strong indicator of a shared landscape. In general, the signs of human presence/activity are higher in the Area 1 where traces of *Vitis* are more evident (0.2% versus 0.02%) and cereals are three times higher (9% versus 3%).

The other major differences between the two Areas Phase 3 contexts are Cichorieae and cereal pollen: Cichorieae in Area I (23%) are about half that in Area III (47%), while conversely Cerealia are higher in Area I (9%) than in Area III (3%). In the two areas, the cereals present were consistent with barley (*Hordeum* group, 5% vs. 1.2%) almost double than wheats (*Avena/Triticum* group, 2.2% vs 0.6%) suggesting similar cropping patterns but different accumulations/proximities. This difference could be explained by different depositional contexts: Area I, Phase 3 was a deliberate fill of a single, short moment and may have included a skewed sample of cereal-rich soils, while Area III, Phase 3 contexts were produced by a slow roof collapse and abandonment, representing a broader cross section of time and without the skewing introduced by fill material from (potentially) elsewhere. Area III is more likely to represent the general cereal/pasture landscape of the period than Area I. We should suppose that Phase 3 represents a return to a more heavily pastured, grazing landscape along with a decrease in cereal production. This represents a major change from Phase 2, with its cereal-rich, pasture poor environment, which

predominated during the site's heyday as a ceramic manufacturing and distribution center.

10.8 Coins (SCE)

Thirty-one coins were found at Marzuolo (Figs. 10.62 and 10.63, Table 10.23), the vast majority (23) in Area III from the late 2nd/early 3rd c. abandonment and collapse of the roof of Structure 4 (Fig. 10.64). Marzuolo yielded the second highest number of coins in the project, after Pievina (36), with issues from the Republican period through to the early 4th c. AD. All of the coins came from secondary or tertiary contexts which are nevertheless attributable to a given phase.

Republican coins at Marzuolo come from Areas II and III, and are heavily worn, namely an Apollo/Roma-type denarius of 99–96 BC (SF 214023 from SU 14009; RRC 335/1a) and an *as* with faint traces indicating it was of the Janus/ship's prow type (SF 211014 from SU 11048), which could possibly date to the first half of the 2nd c. BC. One less worn *as* of the Janus/ship's head type can be identified from the traces of [CN] MA[G] above the ship, indicating an issue of Cn. Pompey dated to 46–45 BC (SF 211003 from SU 11000; RRC 471-1). The earliest coinage that is contemporary to the occupation of the site consists of issues of Octavian/Augustus, the first of which is an issue dated to 38 BC of an Octavian/Divus Julius type (RPC 535/1; SF 214002 from SU 14005). All of the Republican issues come from contexts deposited in Phase 2 or later, save for SF 211014, which comes from Phase 1. The possibility that the other Republican issues remained in circulation well into the 3rd c. AD cannot be excluded, especially given their wear patterns. Nevertheless, there is an equal chance they are residual artifacts that happened to be redeposited in later periods of the site's occupation, having perhaps been lost randomly at some point in the late 1st c. BC or early 1st c. AD.

Other issues could be attributed to Phase 1 use and loss but are found in contexts dating to Phase 3, and, thus, the moment of their loss from circulation can only be confirmed at the time of their depositional context. These involve small denomination issues struck under the emperor Claudius: one *as* (SF 211010 from SU 11028, the collapse of building), a second *as* with the head of Germanicus (SF 211015 from SU 11022), and a *quadrans* with a *modius* dating to 42 AD (SF 214069 from SU 14034). There were no coins recovered from Phase 2 contexts. It would seem perhaps equally likely that a Vespasianic *as* of the *Iudaea Capta* type, which was found in SU 11016 (Phase 3), could have been lost either in Phase 3 or Phase 2 and randomly included in the debris of the roof collapse, which could be the case with another illegible issue potentially dating to the 1st or 2nd c. AD (SF 211004). A denarius of the emperor Galba (SF 211008) was recovered from the topsoil and could conceivably date to either the Phase 2 or Phase 3 use assemblage of coins.

The majority of the coins come from Phase 3 contexts, and their spatial distribution on the site is in Areas II and III. Area I only yielded two illegible issues, perhaps dating to the late 3rd or early 4th c. AD (SF 210001 and 214040), while the remainder came from Areas II and III. The issues date from the Hadrianic to Tetrarchic period and would appear to comprise random losses over the course of the occupation of the site, from contexts SU 11016, 11029, 11036, 12004, 12020, and 13008, consisting of small denomination bronze coinage as well as silvered antoniniani. Bronze issues include a *dupondius* or *as* of Hadrian with a portrait of Sabina Augusta on the obverse (SF 211001), and five *sestertii*: one of Antoninus Pius issued in early 161 AD (SF 211006), another of Severus Alexander in 230 AD (SF 211007), a third of Maximinus in 235–238 AD (SF 211012), a fourth of Pupienus in April/June 238 AD (SF 211011), and finally an issue with the portrait of Salonina, the wife of Gallienus, issued in 255–257 AD (SF 213012). Four antoninani include two poorly preserved issues of Gallienus (SF 212001) and Aurelian (SF 211009) and more legible coins of Claudius II (SF 211016) and Probus (SF 213015). The latest datable coins came from Area II: two fractional AE2 coins, one issued under Constantius Chlorus (SF 212004) 294–299 AD, and another under Maximian (SF 212005) 297–298 AD, with the latest identifiable issues two bronze AE3/4 issues of Maxentius of the *Vot./Mult*. type dating to 310–312 AD from Area II, suggesting the abandonment of the site just after the onset of the Constantinian era.

The chronological and spatial distribution of the coins in Area III calls for some comment (see Fig. 10.64). Area III had originally been a workshop area, with kilns in the front and back yards of Structure 4

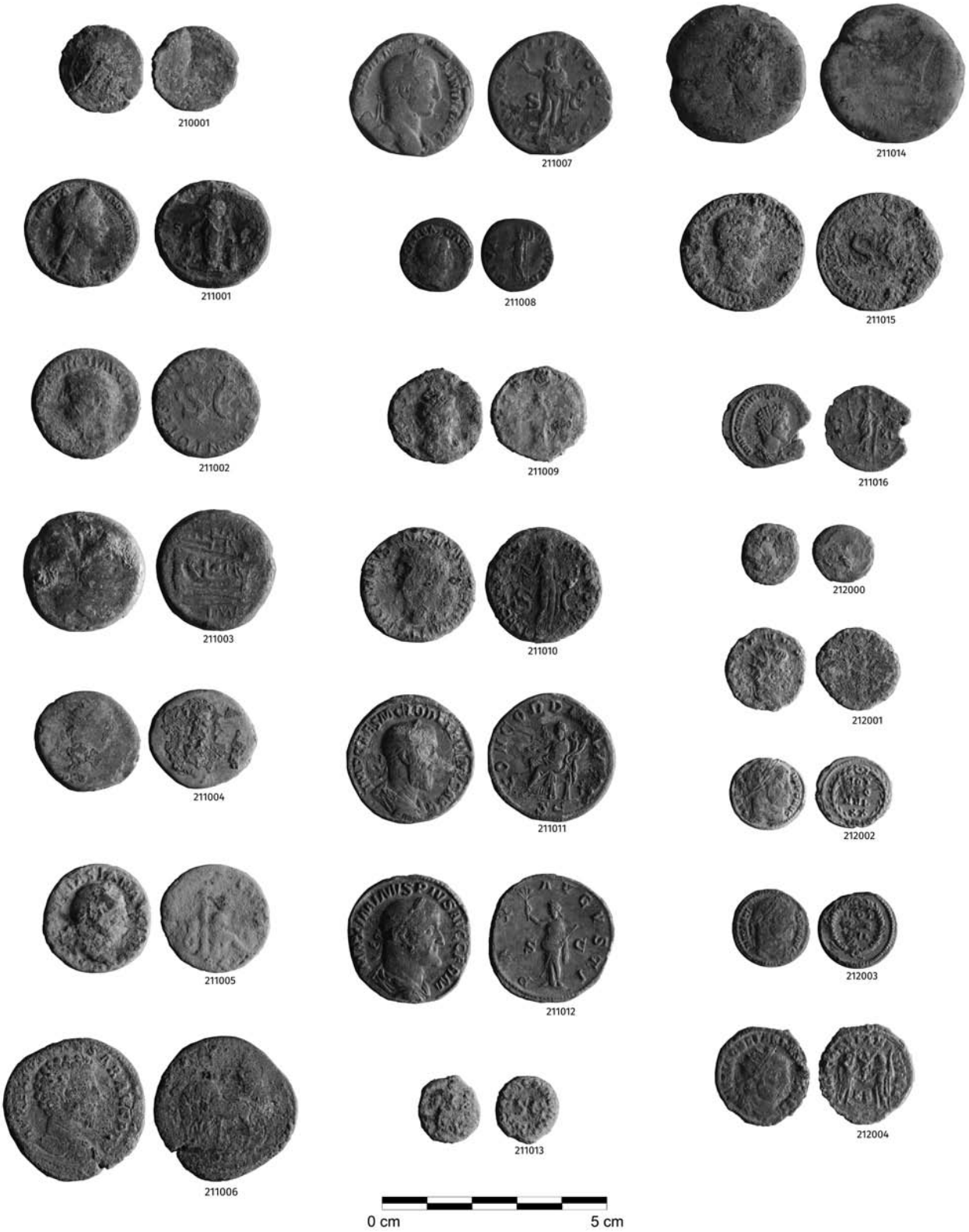


Fig. 10.62 Marzuolo, coins (SF 210001–212004) (SCE).

Fig. 10.63 Marzuolo, coins (SF 212005–214069) (SCE).

during the Augustan period. Its use during the 2nd–3rd centuries is unclear. Given that none of the coins could be assigned to a primary context deposit with certainty, it is difficult to say whether they were all in circulation up until the end of the site, and all comprise part of the same use-assemblage that was deposited more or less at the start of the 4th c. AD, or whether they were lost gradually over 2nd and 3rd c. AD and subject to redeposition over the course of the site's occupation. The rate of coins is not so high as to indicate a specific locus of commercial activity but seems to be consistent with normal levels of use or loss over time.

10.9 Small Finds (SCE)

Like the coins, the small finds at Marzuolo were both abundant and diverse compared to other sites in the project and have specific spatial distributions within different areas of the site. Marzuolo possessed an array of materials related to domestic life such as pins, a die, and gaming tokens, as well as various decorations or fittings. Particularly abundant were finds of copper alloy and iron nails in Area I, and noteworthy are the finds of iron hematite and hand picks for potential craft production in the vicinity. Areas II and III are difficult to characterize generally, as they are comprised both finds related to personal life (like tweezers) and craft refuse (like metal slag). Within the group of project sites, Marzuolo, especially in Phases 2 and 3, possessed the greatest densities of small finds related to domestic and craft activities (including the accumulated waste from those activities). This is not just a product of the intensity of excavation but is apparent when find quantities are adjusted for surface area excavated. Moreover, the presence of stone tesserae should not be overlooked. While the majority were recovered from topsoil or Phase 4, one tessera was found in context SU 10026 (Phase 2) and SU 11029 (Phase 3), which point to a mosaic floor nearby, perhaps laid at some point in the 1st c. AD. Indeed, the small finds evidence, speaks to a traditional understanding of "villa culture," manifested in a productive rural estate containing both centers of production, *partes rusticae* and *figlinae* (potteries), as well as urbane, elite spaces (Purcell 1995; Marzano 2007:90–93, 102–124; for production spaces even at *villae maritimae*, see Marzano [2007:34, 44–46]).

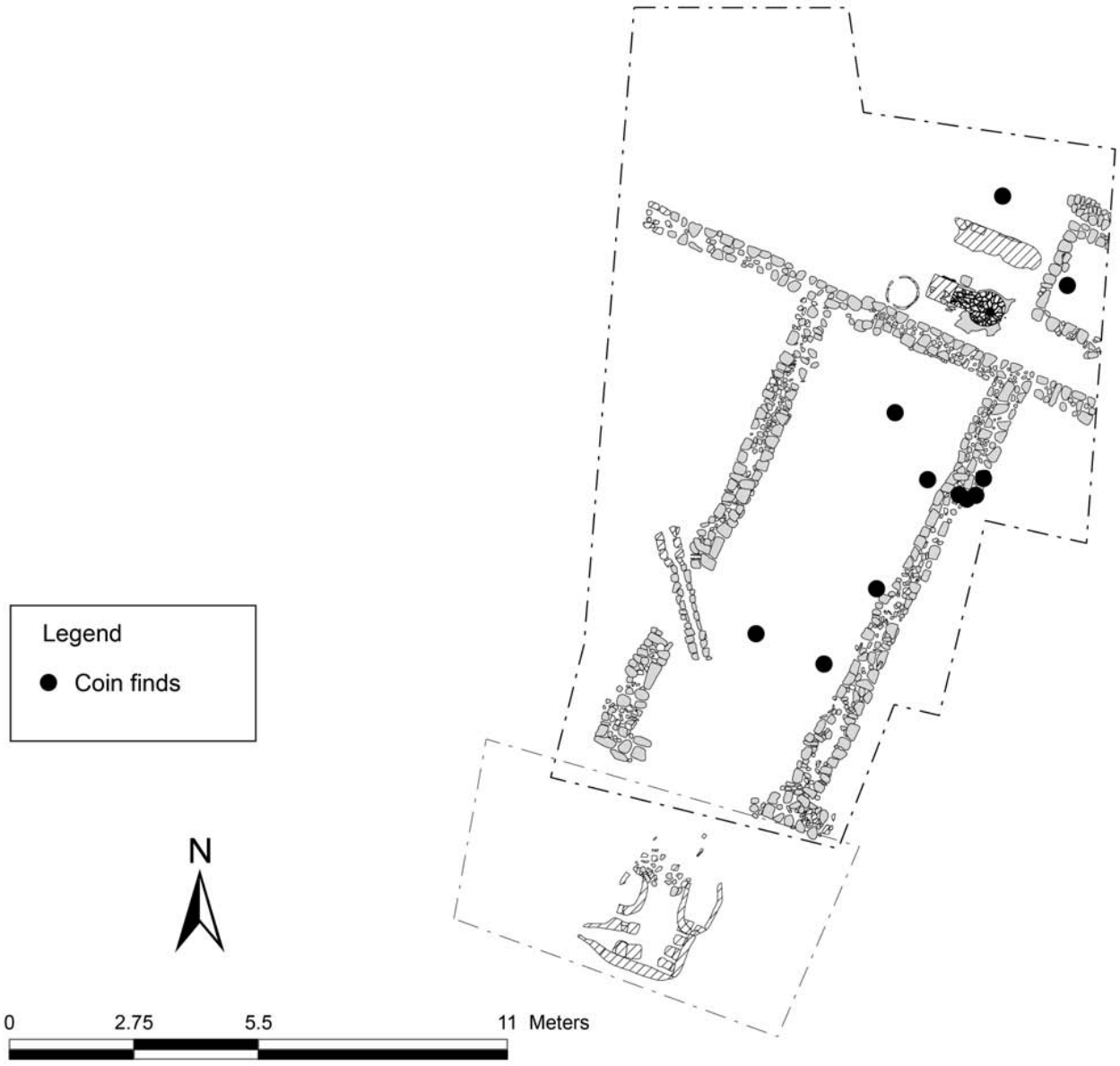


Fig. 10.64 Marzuolo, Area III plan showing coin finds (ERZ/MS).

Area I

The largest number of small finds in this area were nails: copper alloy nails, a rarity in general, were concentrated in a possible roof collapse (SU 10033), while some 50 iron nail fragments were also found in this same context. Given this peculiar concentration of nails within the site and their overall spatial distribution, it is difficult to speculate on their function prior to their deposition. Their use as part of a built structure does not seem likely, nor can they be convincingly attributed to a specific type of furniture. A possible hint might come from the presence of three iron anvils (SF 310089, 310145, and 310146) (two of which are shown in Figs. 10.65 and 10.66), all highly oxidized, one of which (SF 310146) had fragments of iron nail bonded to its surface. It might be suggested that ironworking, namely, the production of nails, is a reasonable explanation behind the large numbers of nails found in these contexts. Iron cording

Table 10.23 Marzuolo, coin finds by stratigraphic context, within which organized chronologically (SCE)

Phase	Archaeological context	SU	Authority and mint	Date	Metal and Denomination	Obverse	Reverse	Weight and size	Reference	SF
MZ	Topsoil	10000	Uncertain attribution	4th c. AD	AE nummus	Illegible.	Illegible.	3.75 g 21–21 mm		210001
		11000	Sabina, Rome	118–136 AD	AE Dupondius or As	[SABINA AVG]VSTA HADRIANI AV[G P P]. Diademed, draped bust of Sabina right.	[PIETAS AVG]. Pietas standing front, looking left, with her hands on the head of a little girl on the left and a little boy on the right. S C on either side.	12.25 g 25–23 mm	RIC II Hadrian 1040	211001
			Tiberius, Rome	21–22 AD	AE As	DRVSVS CAES] AR TI AVG F [DIVI AVG N]. Head of Drusus, bare, l.	[PONTIF TRIB] VN POTEST ITER around large SC.	9.47 g 25–25 mm	RIC I² Tiberius 45	211002
			Gnaeus Pompey, Spain	46–45 BC	AE As	Laureate head of Janus, above |.	Ship's prow r., IMP in exergue. Above prow, CN] MA[G]	25.74 g 28–27 mm	RRC 471/1	211003
			Galba, Rome	July 68–January 69 AD	AR Denarius	IMP] SER GALBA CAESAR AVG. Laureate head of Galba r.	DIVA AVGVSTA. Livia standing l. holding scepter.	3.26 g 17–17 mm	RIC I² Galba 185	211008
		12002	Uncertain attribution	4th c. AD	AE3	Illegible.	Illegible.	1.51 g 14–13 mm		212000
			Gallienus, Unknown	260–268 AD	AE/AR Antoninianus	GALL]IENVS. Head of Gallienus facing r. with radiate crown.	Illegible.	1.61 g 18–17 mm		212001
3	Collapse	11016	Uncertain attribution	1st–2nd c. AD	AE nummus	Incsription illegible. Male bust r.	Illegible.	10.27 g 25–23 mm		211004
			Vespasian, Rome	71 AD	AE As	] VESPASIAN AVG [. Laureate head of Vespasian r.	IVDAEA CAPTA. SC in exergue. Palm tree, Judea seated to right, traces of cuirass and arms.	6.92 g 26–25 mm	cf. RIC II² Vespasian 305	211005
			Antoninus Pius, Rome	early 161 AD	AE Sestertius	AVRELIVS CAESAR AVG PII F. Bust of M. Aurelius r.	Inscription illegible. COS [in exergue. Quadriga advancing left.	21.67 g 35–33 mm	RIC III Antoninus Pius 1360b	211006
			Severus Alexander, Rome	230 AD	AE Sestertius	IMP SEV ALEXANDER AVG. Laureate bust of Severus Alexander r.	P M TR P VIIII COS III PP. Sol with radiate crown standing facing l., holding whip and globe, SC in field.	16.32 g 29–29 mm	RIC IV Severus Alexander 500	211007
		11018	Aurelian(?), Rome(?)	270–275 AD	AE/AR Antoninianus	Insc illegible. Radiate bust of Aurelian (?) r.	LAE]TI[TIA] A[VG]: Laetitia standing left, holding patera (?)	3.1 g 21–20 mm	RIC V.1 Aurelian 50	211009

Table 10.23 cont'd Marzuolo, coin finds by stratigraphic context, within which organized chronologically (SCE

Phase	Archaeological context	SU	Authority and mint	Date	Metal and Denomination	Obverse	Reverse	Weight and size	Reference	SF
3 cont'd	Collapse cont'd	11022	Claudius, Rome	41–43 AD	AE As	GERMAN[ICVS] CAE[SAR TI] AVG F [DIVI AVG N]. Bare head of Germanicus r.	[TI CLAVDIVS CAESAR] AVG GERM P M [TR P IMP P P] around large SC.	9.98 g 30–28 mm	RIC I² Claudius 106	211015
		11028	Claudius, Rome	50–54 AD	AE As	TI CLAVDIVS CAESAR AVG P M TR P IMP P P. Bare head of Claudius l.	LIBERTAS AVGVSTA. Libertas standing facing with pileus, extending l. hand, in between SC	9.21 g 27–26 mm	RIC I² Claudius 113.	211010
		11029	Pupienus, Rome	April–June 238 AD	AE Sestertius	IMP CAES PVPIENVS MAXIMVS AVG. Pupienus, laureate, draped, cuirassed bust r.	CONCORDIA AVGG. Concordia seated l. holding patera and double cornucopiae. SC in exergue.	18.4 g 30–30 mm	RIC IV Pupienus 20	211011
			Claudius II Gothicus, Rome	268–270 AD	AE/AR Antoninianus	IMP C M AVR C[LAVDIVS AVG]. Radiate, drapped bust of Claudius II Gothicus r.	SECVRIT AVG. Securitas standing front, looking left, legs crossed, leaning on column and holding short sceptre. XI in right field	3.07 g 22–19 mm	RIC V.1 Claudius Gothicus 100	211016
		11036	Maximinus Thrax, Rome	235–238 AD	AE Sestertius	MAXIMINVS PIVS AVG GERM. Laureate, draped bust of Maximinus Thrax r.	PAX AVGVSTI. Pax standing l. holding branch and scepter, SC in field.	19.13 g 30–29 mm	RIC IV Maximinus I 81	211012
		11037	Augustus, Rome	4 BC	AE Quadrans	C NAEVIVS CAPELLA around S C	Illegible [IIIVIR A A A F F: Altar with bowl-shaped top, hung with garland]	2.56 g ; mm 15–15	RIC I² Augustus 466	211013
			Roman Republic, Rome	ca. 211–146 BC	AE As	Traces of head of Janus.	Traces of ship's prow r.	24.05 g 32–33 mm	Cf. RRC 197–198B.1b, but could belong to a number of types issued.	211014
		12004	Maxentius, Rome	310–312 AD	AE3 or AE4	MAXENTIVS P F AVG. Head of Maxentius r.	VOT QQ MVL XX in wreath. Four lines in wreath. No mintmark	1.65 g 17–16 mm	RIC VI Roma 281c	212002
			Maxentius, Rome	310–312 AD	AE3 or AE4	MAXENTIVS P F AVG. Head of Maxentius r.	VOT QQ MVL X in wreath. Four lines in wreath. No mintmark	1.91 g 17–17 mm	RIC VI Roma 281a	212003
		12020	Augustus, Rome	9 BC	AE Quadrans	LAMIA] SILIVS ANNI[VS. Clasped hands holding caduceus.	I]II VIR A A A [F F]. Large SC in field.	2.71 g 18–11 mm	RIC I² Augustus 420	212006

Table 10.23 cont'd Marzuolo, coin finds by stratigraphic context, within which organized chronologically (SCE

Phase	Archaeological context	SU	Authority and mint	Date	Metal and Denomination	Obverse	Reverse	Weight and size	Reference	SF
3 cont'd	Collapse cont'd	12020	Constantius Chlorus, Cyzicus	294–299 AD	AE2	FL VAL CONSTANTIVS [NO]B CAES. Draped, radiate bust of Constantius I r.	CONCORDIA MILITVM, Constantius standing right in military dress, receiving Victory on globe from Jupiter facing left, leaning on sceptre, star over KB between them.	2.62 g 23–21 mm	RIC VI Cyzicus 19a	212004
		13006	Maximianus, Rome (?)	297–298 AD	AE2	IMP C MAXIMIAN[VS. Radiate bust of Maximianus r.	VOT XX [. Three lines in wreath. Mintmark illegible.	1.48 g 22–21 mm	RIC VI Roma 75	212005
		13008	Probus, Rome	276 AD	AR/AR Antoninianus	IMP C M AVR PROBVS AVG. Probus, radiate cuirassed bust r.	FIDES MILIT. Fides standing, holding scepter and transverse ensign. XXIΓ in exergue.	3.61 g 22–21 mm	RIC V.2 Probus 151	213015
		14005	Salonina, Rome	ca. 255–257 AD	AE Sestertius	[CORNELIA] SALO[NINA AVG]. Diademed and draped bust of Salonina r.	[IVNO REGINA]. Juno standing l. holding patera in right hand and long scepter in left. SC in field.	15.08 g 27–25 mm	RIC V.1 Salonina 46	213012
		14007	Octavian / Augustus, Italy	38 BC	AE Uncertain	DIVI [F CAESAR]. Head of Octavian r. Border of dots	[DIVOS] IVLI[V] S Wreathed head of Caesar right. Border of dots.	18.2 g 30–26 mm	RRC 535/1	214002
	Structure Fill	14034	Uncertain attribution	4th c. AD (?)	AE3 (?)	Illegible.	Illegible.	1.15 g 13–12 mm		214040
2		14008	Uncertain attribution	1st–2nd c. AD	AE Uncertain	Traces of bust right.	Illegible.	8.97 g 25–24 mm		214018
		14009	Roman Republic, Rome	99–96 BC	AR Denarius	Laureate head of Apollo r.	ROMA in exergue; traces of pile of shields, victory standing to r.	1.41 g 17–14 mm	RRC 335/2	214023
1	Kiln Abandonment	11048	Claudius, Rome	5 January–31 December, 42 AD	AE Quadrans	[TI CLA]VD[I]VS CAESA[R AVG]. Three legged modius.	PON M [TR P] IMP P P COS II. Large SC in field.	2.03 g 18–16 mm	RIC I^2 Claudius 90	214069

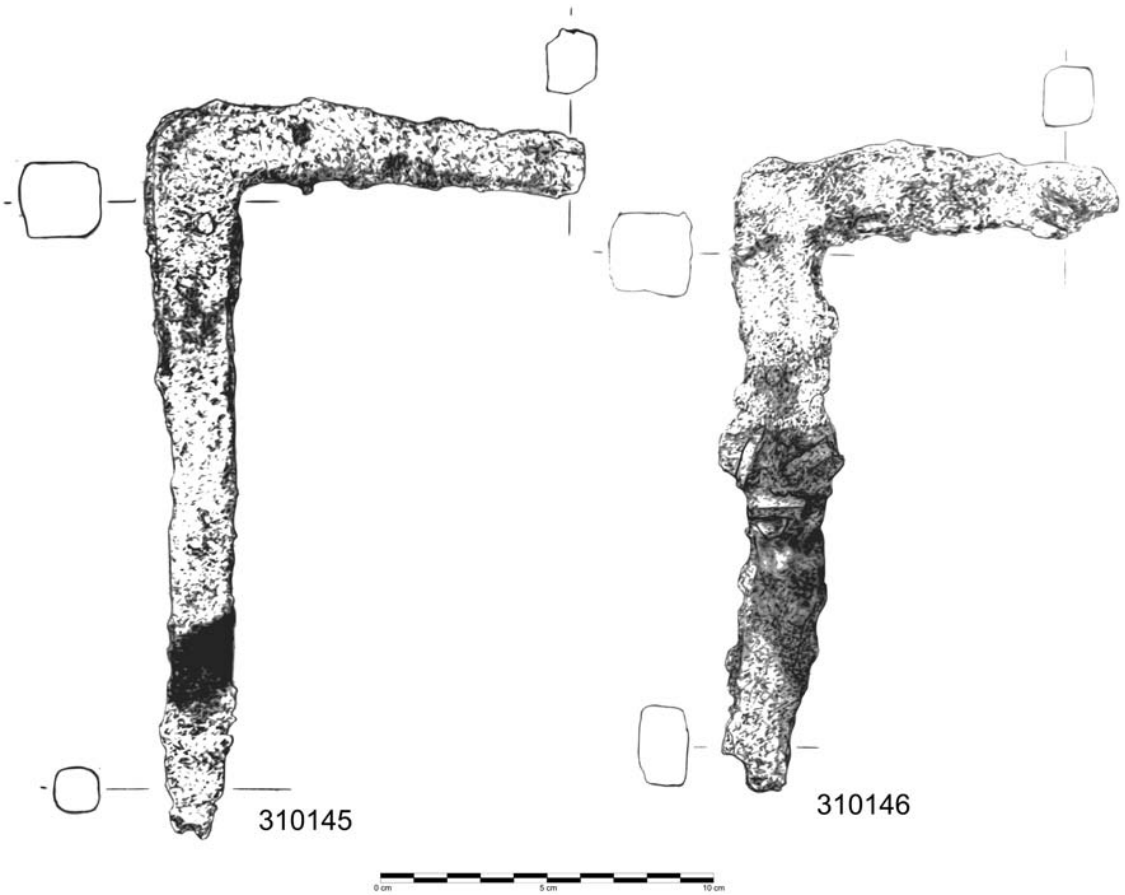


Fig. 10.65 Marzuolo, drawing, iron anvils (SF 310145 left, 310146 right) from Area I (SCE).

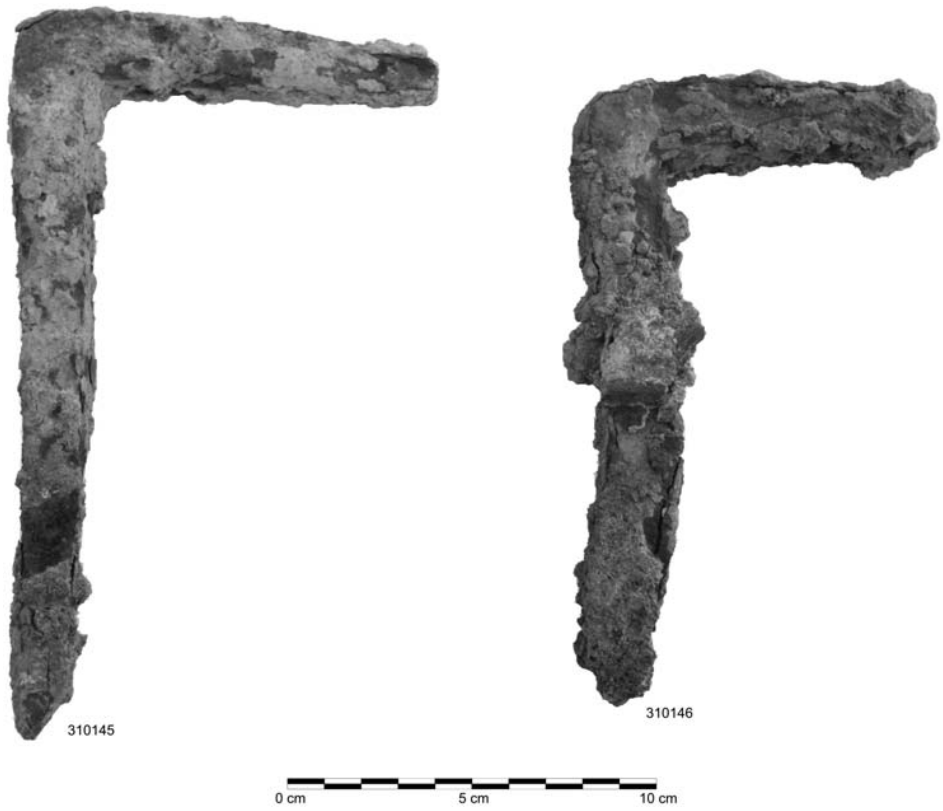


Fig. 10.66 Marzuolo, photo, iron anvils (SF 310145 left, 310146 right) from Area I (SCE).

(SF 310071) and an iron hook (SF 310112) were also present. Copper alloy vessels and their fragments were also relatively abundant in this area including a copper alloy vessel lid (SF 310150), a handle (SF 310131), and a large fragment of a pitcher (SF 310144). (Figs. 10.67 and10.68). The later was largely intact but crushed and categorized by Tassinari (1993) as a type C1221 pitcher. In the topsoil, a door bolt (SF 310136), if dating to this phase, would indicate that parts of this production area of the site or the *opus reticulatum* building were secured.

Some of most interesting finds from this area were regrettably from the topsoil, including a copper alloy appliqué with phallic(?) decoration (SF 310029) (Fig. 10.70), as well as an iron awl (SF 310512; Fig.10.72). More important for the interpretation of the site were a series of stone tesserae (SF 510009–501016) (Fig. 10.69). While the excavations in the *opus reticulatum* building produced no definitive floor, these finds suggest a more complete, potentially more luxurious part of the structure nearby.

The nature of the finds from the 2nd–3rd c. fill of the *opus reticulatum* building are quite different in character. A series of copper alloy studs (SF 314020, 314043, 314085), a copper alloy knob (SF 314076) (see Fig. 10.70), a binding (SF 314024), and a fragment of a copper alloy chain (SF 314006) all indicate items of personal ornament and/or furniture decoration. The fill also yielded a fragment of an iron sword or knife point (SF 314068) (Fig. 10.72). Two bone needles (SF 514047, 514067), nine bone pins (SF 511014, 514014, 514015, 514016, 514026, 514034, 514072, 514019, 514025) (Fig. 10.71), a die (SF 514032), and a vitreous gaming token (SF 514020) (Fig. 10.72) complete the picture of a fill composed in part of domestic rubbish. Seven fragments of window glass were also found in this fill (see below).

From the medieval levels came a copper alloy lock bolt (SF 310010), necklace fragment (SF 310105), and vessel handle (SF 310131), which are probably residual finds from the Roman phase of the site. Iron hematite indicative of ironworking is also present (SF 310008, 310013), but it is not clear if this may not also be residual as well.

Some 47 pieces of slag were found in Area I, again, much of it in the plow soil. Half of these were iron slag, and 22 had a much lighter, almost vitreous or pumice-like quality. We never subjected these to chemical testing to determine their content but speculated that they could relate to some aspect of the firing process or even glass production.

Area III

Unlike those from Area I, the finds in Area III were abundant in personal objects. This is true both from the 30–10 BC period, when the two kilns were in use here, as well as during the 2nd–3rd c. abandonment levels.

Finds from the 30–10 BC dumps in the rear of the building included a finger ring (SF 311021), a copper alloy stud (SF 313005) (see Fig. 10.70), a loom weight (SF 511005) (Fig. 10.73), and two rings (SF 311058, 311059), while from the abandonment of the kiln in front of the building come a series of three ceramic loom weights (SF 512008, 512009, 512010) (see Fig. 10.73). Missing here are the larger bronze vessels, anvils, and other tools from the 50–70 AD ceramic production area in Area II.

From the 2nd–3rd c. AD collapse of the building come three copper alloy dress pins (SF 312007, SF 312011, and 312021), a set of tweezers (SF 312005) and three rings (SF 311033, 311058 and SF 311018) (see Fig. 10.70). A vessel support was retrieved from the topsoil context, SF 311001 (Fig. 10.70), which has clear comparanda from the 1st c. AD.

The topsoil further produced the lid of a leaf-shaped seal-box (SF 312000) with phallic decoration (Andrews 2012: type D15), dating to the 2nd–3rd c. AD (see Fig. 10.70). Seal-boxes have been treated recently as markers of literacy, and research on their distribution in the lower Rhine and Britain shows that they are fairly diffuse and common on a variety of rural site types, not just military bases or villas (Derks and Roymans 2002; Hingley 2005:96–98). Andrews (2013) provides a convincing argument for the use of such boxes as a means to seal leather pouches or bags in order to prevent tampering with the contents, rather than associating them with stylus-tablets and hence as firm indicators of literacy. All the same, the attestation of literacy (broadly defined) at Marzuolo is secure by virtue of the terra sigillata stamps and the aforementioned tile graffito, VERECVNDVS, likely the name of the manufacturer. While the single name might be taken to indicate a non-citizen (i.e., servile) identity, the use of a cognomen alone might not be out of the ordinary for an informal text like a tile graffito. All the same, Marzuolo is one of only two sites to

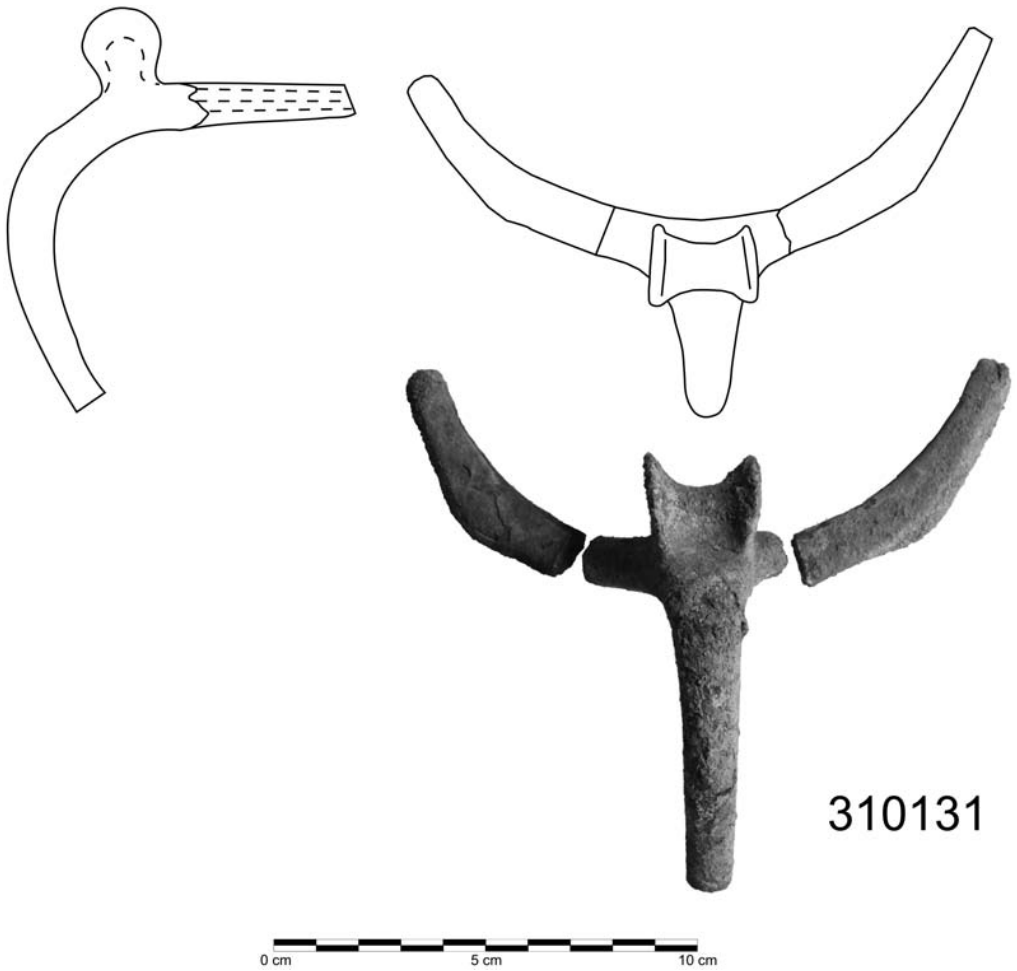


Fig. 10.67 Marzuolo, photo and drawing of a copper alloy handle (SF 310131) from Area I (SCE).

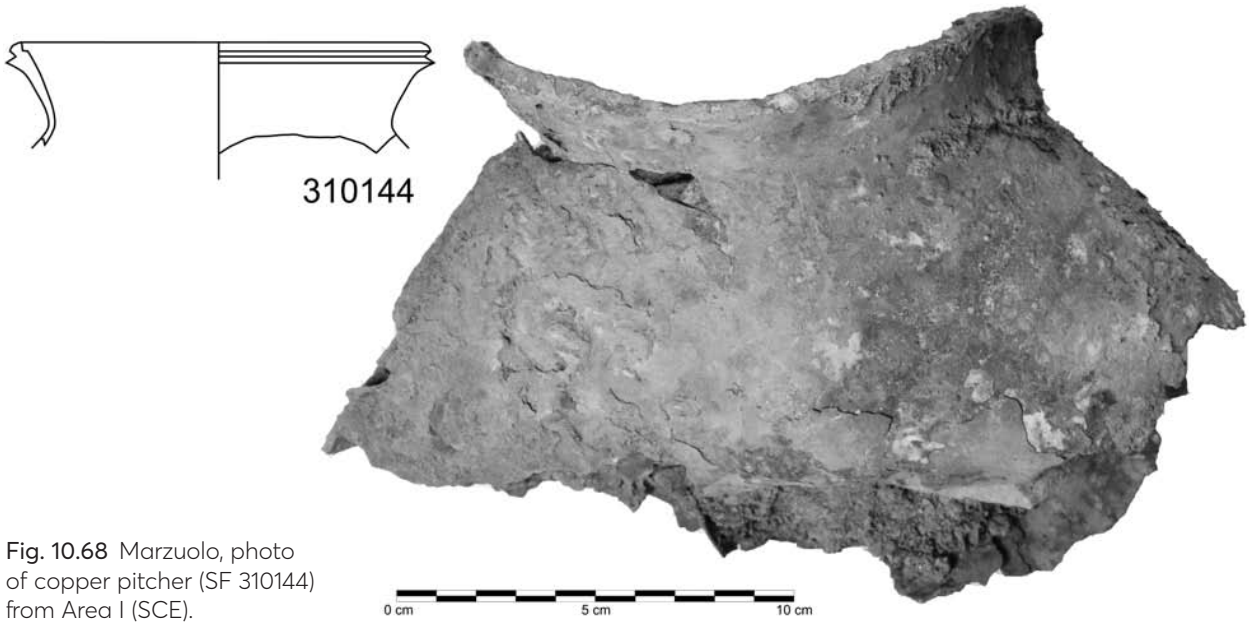


Fig. 10.68 Marzuolo, photo of copper pitcher (SF 310144) from Area I (SCE).

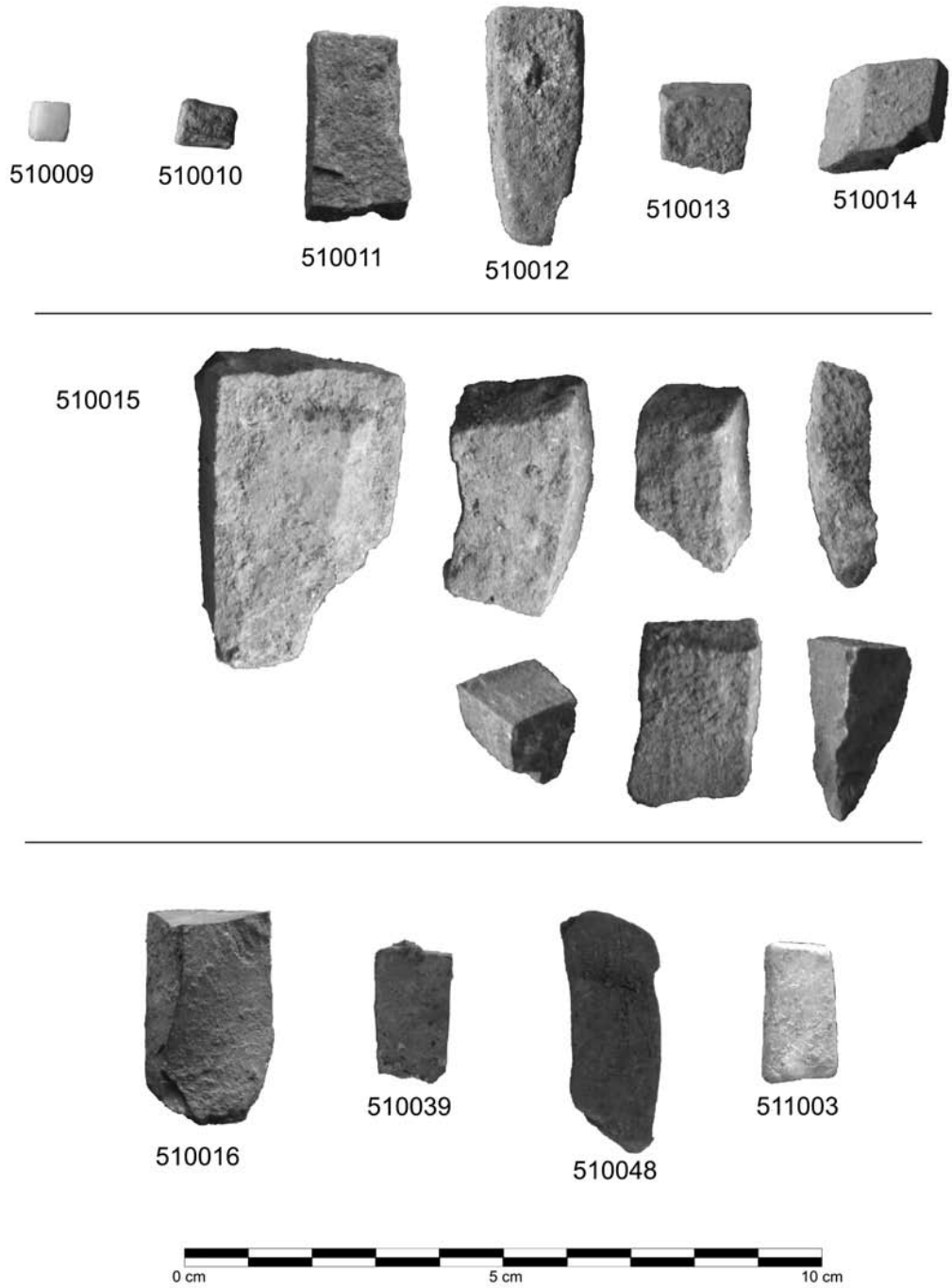


Fig. 10.69 Marzuolo, stone tesserae (SCE).

Fig. 10.70 Marzuolo, copper alloy objects: appliqué with phallic (?) decoration (SF 310029); dress pins (SF 312007, 312011, 312021); tweezers (SF 312005); studs (SF 313005, 314020, 314043, 314085); finger ring (SF 311021); ring (SF 311018); seal-box with phallic symbol (SF 312000); copper alloy vessel support (SF 311001); knob (SF 314076) (SCE).

Fig. 10.71 Marzuolo, bone pins (from left to right: SF 511014, 514014, 514015, 514016, 514026, 514064, 514072, 514019, 514025) (SCE).

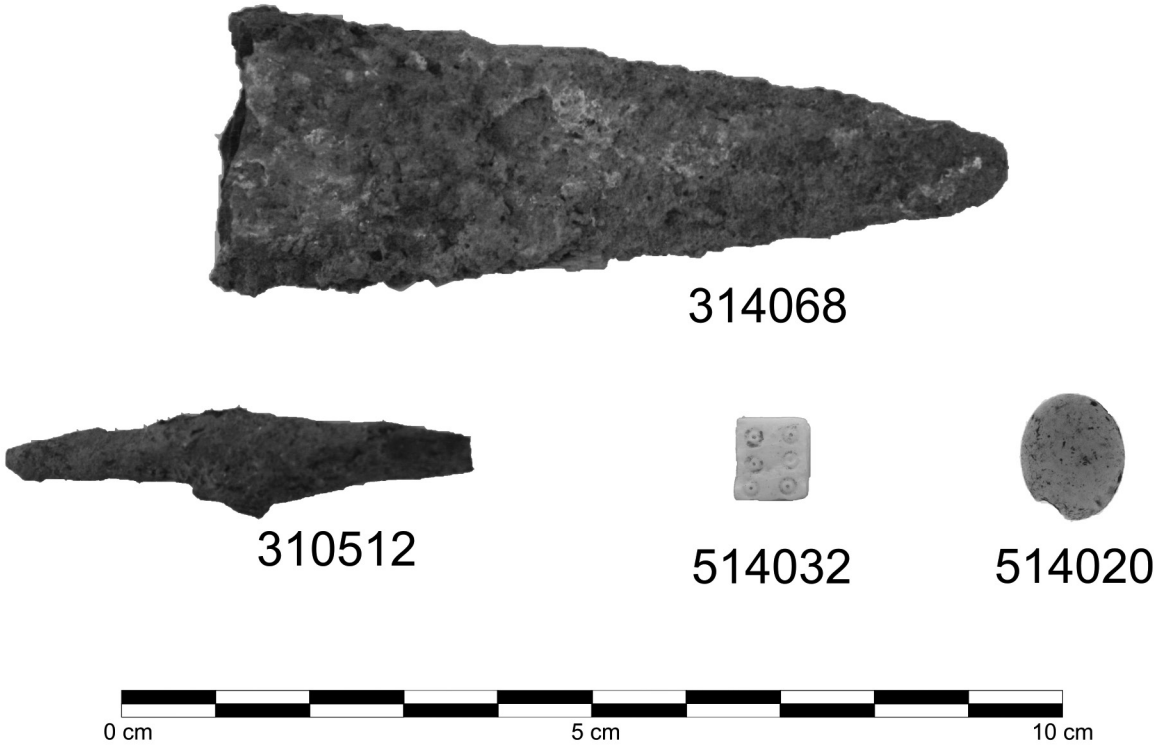


Fig. 10.72 Marzuolo, various small finds: sword (SF 314068); awl (310512); die (514032); gaming token (514020).

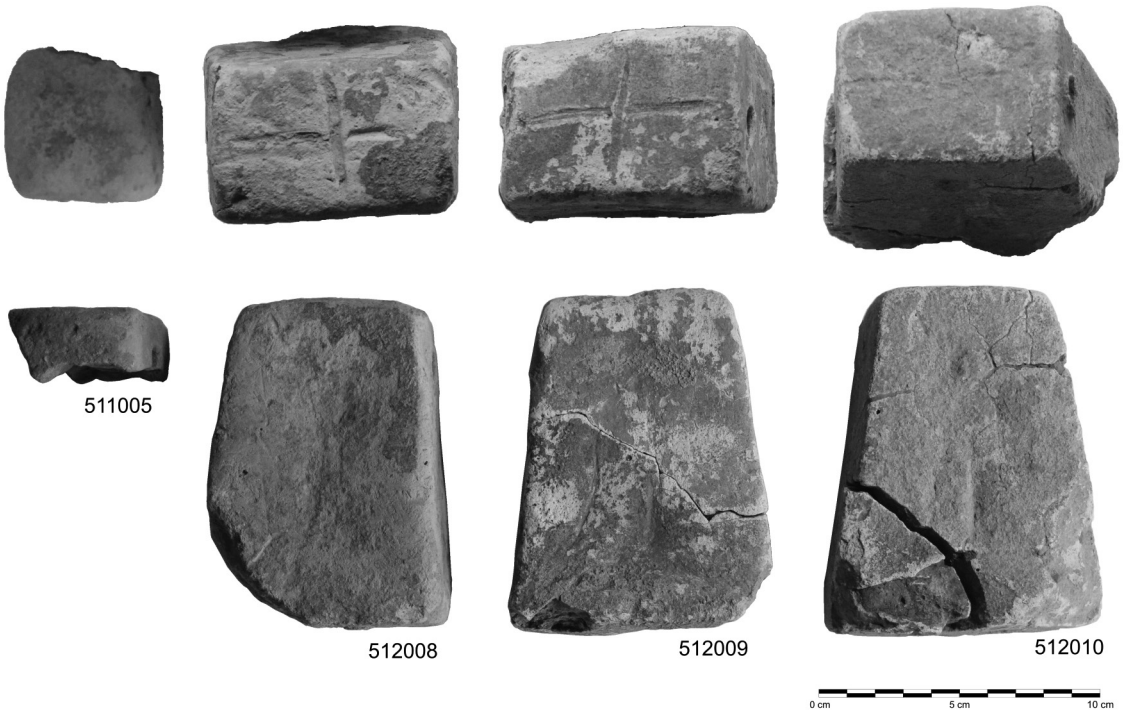


Fig. 10.73 Marzuolo, loom weights (SF 511005; 512008, 512009, 512010) (SCE).

have any evidence of a form of literacy (coin legends excluded). The second such site includes Tombarelle (Collins-Elliott and Bowes 2016, and Ch. 11).

Despite the presence of a reasonably preserved roof collapse, nails numbered less than 20 fragments in these levels.

Finally, slag was equally abundant in Area III as Area I. Some 41 fragments were similarly divided between iron slag and the same, light vitreous material found in Area I. This latter slag was found in the dumps dating from Phase 1 ceramic production.

10.10 Glass (SCE, ERR)

Given that Marzuolo was excavated longer than any other project site, it is no surprise that it has the most abundant quantities of glass (Figs. 10.74 and 10.75, Table 10.24), both vessel (403 fr, 533.75 g, eve 13.5) and window (44 fr., 150.29 g). Vessel forms comprise plates, bowls/cups, conical cups, beakers, bottles, as well as balsamaria (only Marzuolo yielded balsamaria, while the shard from Poggio dell'Amore could also have belonged to a bottle). What is noteworthy is not only the variety of forms, but also that there is evidence of wasters or discard of irregular glass flows or pellets (8 fr., 23.54 g), one bead (0.5 g), and one rod (0.5 g), which hints at glass production on site. Areas yielded different types and quantities of glass, and are discussed separately below, roughly organized by the depositional phases of the site.

Area I

Three hundred and six fragments of vessel glass (397.19 g, EVE 9.27) were found in Area I, comprising most of the glass on the site although much of it came from the plow soil. This collection included both vessel and window glass and was by far the most variegated collection from all project sites. The vessel glass includes fragments of plates, bottles, cups, glasses, a balsamarium, a lamp, and a small mug/measure.

The only glass vessel from a potential Phase 1 context (SU 10129, see discussion on the dating of this context above) is a broad-bordered rim fragment (SF 410224), sky blue in color and in a state of good preservation. The rim is rounded, vertical, and extends slightly outward, with the wall of the vessel glass having been folded downward before cooling in order to form a hollow rib on both the interior and exterior surface. Comparanda for this technique to produce a broad vertical rim appear to be lacking for the early 1st c. AD, whereas clear examples can be found in the Isings 37 one-handled cup or *modiolus* (also potentially Isings 38 *cantharos*), which appears in the Neronian/Flavian period. A similar fragment of a *modiolus*, albeit only with the interior rib, comes from Pompeii Insula VI.1 (Cool 2016:144–145, fig. 5.16.334), securely dated to a post-62 AD context. These cylindrical containers are datable to the second half of the 1st c. AD and are widespread in Italy (cf. Lepri 2011:411; Beretta and Di Pasquale 2007:255, n. 2.87).

Phase 2 contexts include a rim fragment (SF 410023) of a blue green Isings 12 bowl or hemispherical cup, ca. 6 cm in restored diameter, with wheel-cut incisions about 0.2 cm below the rim, attributable to the Claudian/Neronian period. Another rim fragment of a small, sky blue bowl, SF 410512 (SU 10023), with a horizontal, fire-rounded rim, has comparanda from post-62 AD contexts in Pompeii (Cool 2016: fig. 5.13.281–283). A colorless tubular-rimmed bowl fragment (SF 410514) can be dated to the early or middle part of the 1st c. AD (cf. Isings 44a, Tiberian-early Flavian). Cool (2016:140–43, fig. 5.14) notes that such bowls have been attested in Augustan-period contexts, but in Pompeii they are found in larger quantities in post-62 AD deposits. A fragment of millefiori glass comprising an out-turned rim from a bowl or cup (SF 410074), from a Phase 2 context (SU 10033), with red and yellow on a blue background, could have been produced in either the 1st c. BC or AD. Another fragment of a *modiolus* rim (SF 410065) comes from SU 10055. This fragment is blue green in color, very poorly preserved with a highly degraded surface (see discussion above on SF 410224). SU 10055 also yielded a fragment of a straight, opaque light-blue ribbon handle with a single groove running down the middle (SF 410066), perhaps from a jug (form Isings 55–57; see Isings 1957:72–77), which could have produced from the Augustan period onward (cf. also Rütti [1991: tab. 163.4227, 163.4229–42231, and 165.4263] for the section of the handle, which cannot be attributed to a specific form). From SU 10135 comes SF 410225, a yellow-green fragment of an outturned, rounded rim, showing the same rim folding that SF 410224 exhibits, SF 410229, a fragment of a tubular rim, and SF 410228, a tubular rim of a blown glass vessel. This phase also included a colorless

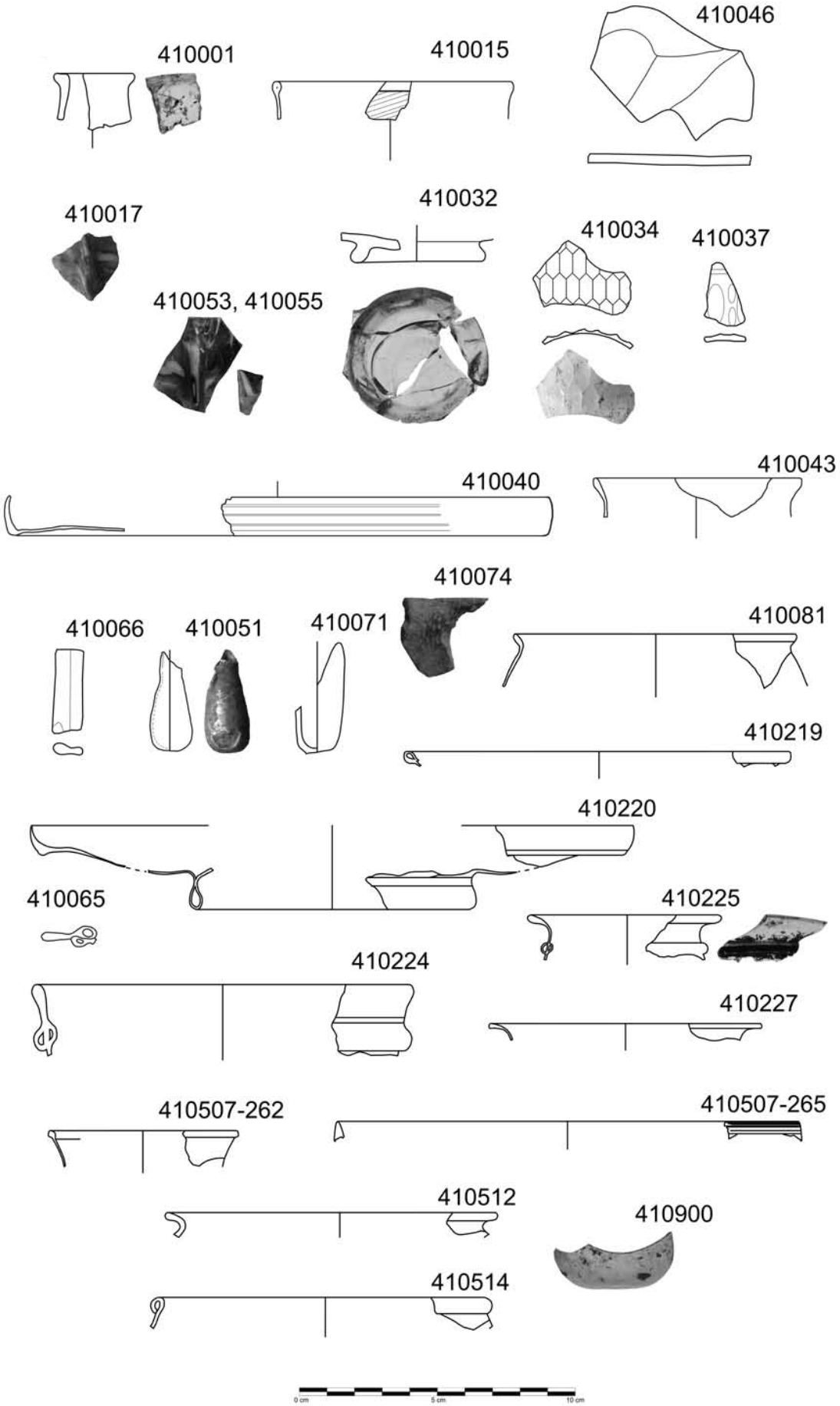


Fig. 10.74 Marzuolo, representative glass fragments (SF 410001–410514) (SCE).

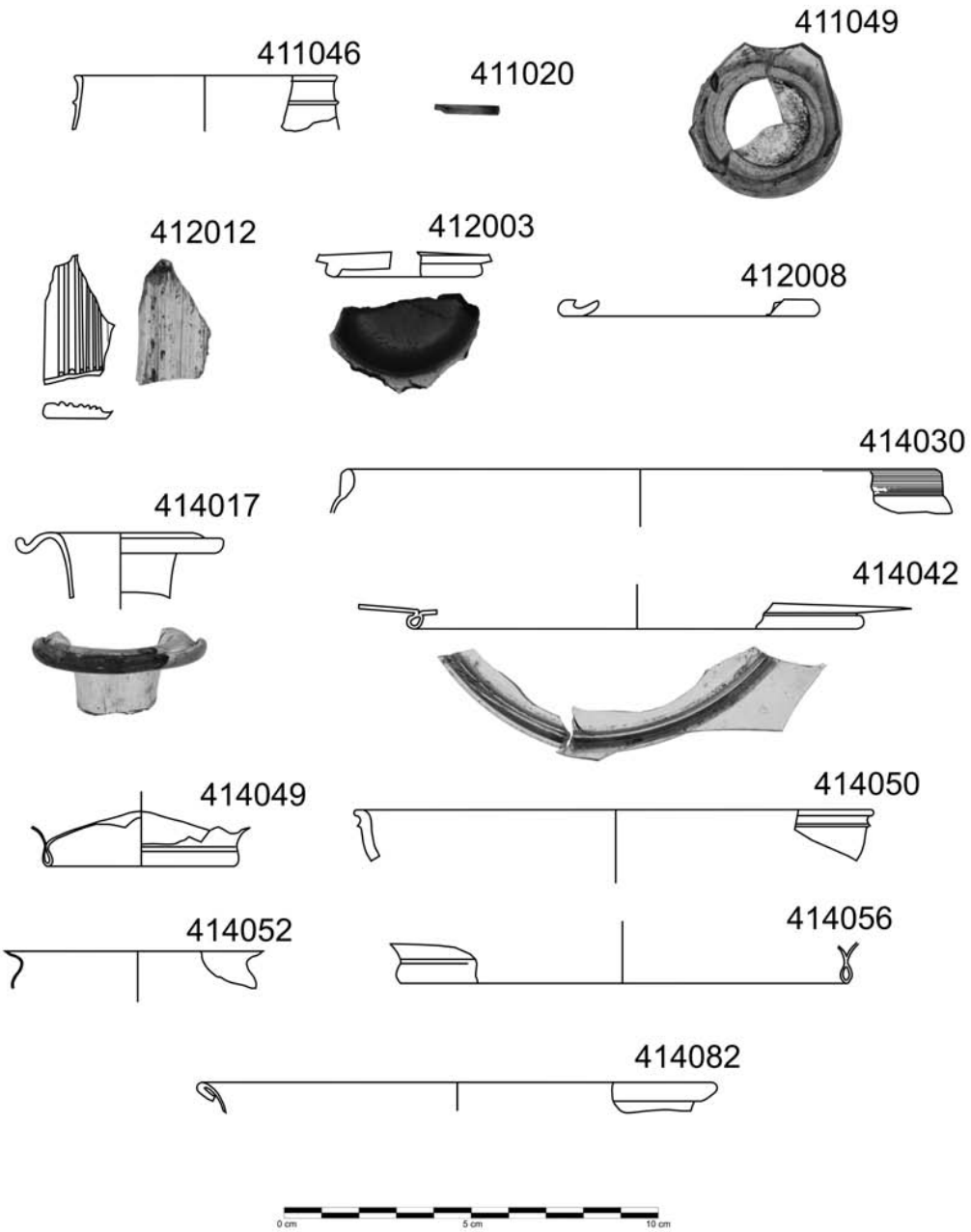


Fig. 10.75 Marzuolo, representative glass fragments (SF 411046–414082) (SCE).

handle fragment of a bottle (SF 410068), likely Flavian or thereafter, a fragment of a balsamarium of tubular form (SF 410051) with a pronounced curve (Tommaso form 71), datable to the 1st c. AD (Massabò 2007:166), as well as a yellow green ring base of a plate or bowl (SF 410900). Finally, a base of a small flask (SF 410900) is too fragmentary to be attributed to a precise form. Among the identifiable body shards from Phase 2 contexts, SF 410063 is from a green balsamarium, while SF 410533 and SF 410055 comprise fragments of a white, blue, and violet-colored ribbed bowl datable to the 1st c. BC or AD.

From Phase 3 comes SF 414030, a fragment of a colorless bowl, with a rounded vertical rim gradually turning inward with abrasion on the exterior. SF 414047 is a blue-green fragment of a bottle, with a flared, undulating, rounded rim. SF 414052 is a translucent white beaker rim fragment, with a simple cut

Table 10.24 Marzuolo, quantification of glass vessels by fragment count, weight, and estimated vessel equivalent by depositional phase (SCE).

Phase	MZ1			MZ2			MZ3			MZ4			MZ Topsoil		
	fr	w	eve	fr	w	eve	fr	w	eve	fr	w	eve	fr	w	eve
Balsamarium	—	—	—	2	2.5	1	—	—	—	—	—	—	—	—	—
Beaker	6	7.8	0.07	2	5.0	0.14	4	3.0	0.24	1	0.5	0.21	7	5.0	0.17
Beaker/Lamp	—	—	—	—	—	—	—	—	—	2	3.5	0.22	1	0.5	0.04
Bottle	—	—	—	1	1.0	0.00	5	51.1	2.40	—	—	—	8	14.0	0.71
Bottle/Jar	—	—	—	1	11.0	0.81	—	—	—	—	—	—	—	—	—
Bowl	1	7.9	0.06	2	4.5	0.08	10	12.8	0.27	1	1.0	0.05	6	7.0	0.18
Bowl/Cup	1	1	0.04	—	—	—	1	0.7	0.07	—	—	—	1	9.68	0.37
Discard	—	—	—	3	8.0	0	—	—	—	—	—	—	2	4.3	0
Isings 21	—	—	—	—	—	—	—	—	—	—	—	—	1	3.0	0
Isings 44a	—	—	—	3	2.50	0.09	—	—	—	—	—	—	—	—	—
Isings 50	—	—	—	—	—	—	—	—	—	—	—	—	10	38.0	0
Isings 66a	—	—	—	—	—	—	1	1.7	0.13	—	—	—	—	—	—
Lamp	—	—	—	—	—	—	—	—	—	1	2.0	0.55	—	—	—
Modiolus	—	—	—	2	2.0	0.03	—	—	—	—	—	—	—	—	—
Pellet	—	—	—	1	0.5	0.00	—	—	—	—	—	—	—	—	—
Pitcher/Bottle	—	—	—	—	—	—	1	4.3	0	—	—	—	—	—	—
Plate	—	—	—	1	7.0	0.33	14	22.7	0.52	—	—	—	19	23.0	0.13
Ribbed Bowl	—	—	—	3	14.0	0.00	—	—	—	1	2.0	0	—	—	—
Rod	—	—	—	—	—	—	1	0.5	0.00	—	—	—	—	—	—
Small Amphora/Jug	—	—	—	2	2.0	0	—	—	—	—	—	—	—	—	—
Small Bottle	—	—	—	1	0.5	0	—	—	—	1	0.5	0	1	15.0	1.00
Window	—	—	—	34	94.00	0.00	7	40.16	0.00	1	4	0	1	0.5	0
NonId	16	7.5	0.78	42	29.7	0.00	107	129.5	1.08	34	46.6	1.22	84	54.4	0.58

rim flaring outward. SF 414050 is a wheel-cut rim of a shallow bowl or cup. SF 414065 is a tubular rim of a ring base of a colorless vessel. SF 414082 comprises fragments of a sky blue bowl with a tubular rim, formed by folding the glass out and over the side. SF 414042 includes base fragments of a colorless glass plate with a low-set tubular rim, while SF 414051 consists of a vertical, high-set tubular base of a vessel. One vessel, SF 410220/410214/410216/410221/410222 (SU 10125 and 10126), consists of a series of fragments of a light green glass plate, which almost enable the reconstruction of complete profile. The vessel rim is a simple cut and fired rim, with a wheel-cut linear band around the exterior of the rim, while the base is tubular in a piriform section. The form of this vessel, as with plate fragment SF 410040 below, might date to the 4th c. AD, but precise comparanda are lacking: most dishes and bowls will have a solid coil or pad base, and will have tubular rims (cf. Isings 97/118), whereas the vessel appears to be too late for 1st c. AD examples (Isings 45). Most of the remaining body shards from this phase are colorless, although there are few unidentifiable fragments of colored glass in sky blue, green, reddish brown, and yellow orange.

Contexts belonging to the medieval phase of Marzuolo (Phase 4) turned up several residual fragments of Roman-period vessels. A clear Roman

residual is a fragment of blue, white, and black ribbon glass in the form of a ribbed bowl (Isings 3), SF 410017, which is dated to the 1st c. BC/AD. Fragments of a beaker or lamp (Isings 106), probably late antique, were recovered across Phase 4 and topsoil contexts (SF 410015/410033/410020 from SU 10000/10025/10003). Other potential Roman-period forms include a vertical fire-rounded flared rim of a beaker (SF 410043), a tubular rim of a colorless bowl or dish (SF 410219), a horizontal flared rim of a beaker (SF 410227), a fragment of a ring base (SF 410018), and a base fragment of a likely balsamarium (SF 410071).

From the topsoil, SF 410507–410265 is a rim fragment of a colorless bowl with an abraded exterior, which could perhaps be attributed to from AR 56 (Rütti 1991: tab. 55. 1259), a hemispherical form dating to the 4th c. AD. Another potential 4th c. AD find may be SF 410040, fragments of a light yellow-green glass plate rim with wheel-cut incisions on the exterior, like SF 410220 above. Additional diagnostic fragments from topsoil include what appears to be a cup (SF 410006), as well as a bottle, including body shards of an Isings 50 form (SF 410007/410060). Of particular interest are two fragments of colorless carved glass (in addition to SF 411026 below). This glass was considered particularly precious, on par with silver vessels with which it shared some decorative motifs. SF 410034 is part of an Isings 21 cup, incised with a honeycomb pattern and datable to the Flavian period (Paolucci 1997:65). SF 410037 has a more elaborate pattern of ovals of various dimensions similar to examples in silver (cf. Paolucci 1997:67).

Window glass at Marzuolo comes entirely from Area I (e.g., SF 410046). There would appear to be at least two different sets of paneling datable to the Roman period, one blue-green, the other colorless. Blue-green window glass is found strictly within 2nd–3rd c. Roman contexts (SU 14004, 14025, and 14026). The colorless window glass (which verges on very light yellow-green) is attested in 50–70 AD Roman-era contexts SU 10033 and 10081. Other colorless glass fragments in medieval layers can be assigned to the same shard family as these fragments. At least one other set of fragments of sky-blue window glass from medieval SU 10023 cannot be securely identified as Roman residuals. That said, whether or not these panel groups constitute two distinct chronological phases of window glass or merely two different colors of panels used in different rooms cannot be determined.

Glass discard is also largely concentrated in Area I contexts. Most of these finds (SF 410047, 410049, 410052, and 410045) come from Phase 2 levels (SU 10023, 10033), with a couple fragments from Phase 3 (SF 414033) and the topsoil (SF 410064).

Area II

Twenty-nine shards of vessel glass (46.06 g; EVE 0.76), all from topsoil or Phase 3 contexts, 25 of which were body shards, were found in Area II. The colors of the body shards range from colorless, yellow-green, blue-green, sky blue, dark blue, yellow, to opaque black. Identifiable forms included a light green Isings 66a lid rim fragment, datable to the second half of the 1st c. or start of the 2nd c. AD, from SU 12004 (Phase 3). Other diagnostic finds included a fragment of a straight ribbon handle (SF 412012), likely part of a bottle which could date to the first or 2nd c. AD, a form which is particularly long-lived and prone to redeposition out of its original context (Compton et al. 2015). Another fragment of colorless glass (SF 413008) of an outward-turned rim with a triangular section finds a comparison in form Sette-finestre 47.15, roughly similar to Isings 42b, which could also date to the second half of the 1st c. or 2nd c. AD. Unidentified forms include a fragment of a dark green ring base (SF 412003, from topsoil) and a dark violet rim from a Phase 3 context (SU 13002), which shows signs of heavy pitting on the surface of the vessel. In terms of body shards with distinctive characteristics, one sky-blue body fragment (SF 412000) with two parallel bands of wheel-cut lines comes from the topsoil, which unfortunately cannot be attributed to a specific form.

In terms of non-vessel glass, Area II had six fragments of irregular glass flow, light to dark violet in color (SF 313017), probably from production, recovered from a Phase 3 context (SU 13015), one fragment of glass discard from the topsoil (SF 412005), as well as one cobalt blue bead (SF 412014) from a Phase 1 context (SU 12014).

Area III

Ninety-seven shards of vessel glass (136.56 g; EVE 4.28) were found in Area III. While window

glass and irregular glass flows were absent, this area did contain one fragment of a glass rod, blue-green in color (SU 11029, Phase 3), a scant indicator that there could have been glass vessel production in the area.

Three diagnostic fragments come from SU 11048, an Augustan-phase context: first, SF 411034, which consists of a small rim fragment of a cast vessel, likely a plate or bowl, a very faint yellow to almost colorless. This fragment shows heavy signs of wear on the surface. Second, SF 411036 (from SU 11048) is comprised of a dark green ring base of a cast vessel with signs of pitting on the surface. Third is a light blue-green rim fragment from a jug or bottle (SF 411032), ca. 3 cm in restored diameter, largely free of bubbles. Additional fragments from Phase 1 levels include thirteen body shards of cobalt blue, amber, and colorless glass. Precise comparisons of vessels from the Augustan period are difficult for these records given their fragmentary state.

From various contexts belonging to Phase 3 come five fragments of a colorless beaker (SF 411046) with a slightly inward-leaning profile, with a simple cut rim, slightly outturned and with an additional thread infused around the edge about 0.8 cm below the rim, ca. 7 cm in restored diameter. This vessel is similar to form Settefinestre 49.7, attested there from the Trajanic to late Antonine period (De Tommaso and Poggesi 1985:192–193). SF 410015 (SU 11016) consists of a small fragment of a light yellow-green outturned rim which cannot be attributed to a precise form vessel. SF 411024 (SU 11035) likewise consists of an unworked rim of an unidentified beaker, ca. 6 cm in restored diameter. SF 411028 (SU 11027) comprises two rim fragments of a blue-green bottle, with an outturned, flattened rim and a cylindrical neck, whose form and color suggests it is perhaps datable from the mid-1st to 2nd c. AD (cf. Price and Cottam 1998:191–202). SF 411029 (SU 11033) is a yellow-green fragment of an outturned, rounded rim, lightly abraded on the exterior, with a linear cord infused in relief 1.4 cm below the rim. Likely this belongs to a shallow bowl given the size of the restored diameter (ca. 17 cm). A date ranging in the 2nd–3rd c. AD seems likely (cf. Price and Cottam 1998:106–107). The fragment shows signs of heavy pitting on the surface. Body shards from Phase 3 in this Area are highly variable in color, consisting of colorless, blue-green, cobalt blue, yellow-green, sky blue, and light yellow glass, as well as opaque black. One small body shard of mosaic ribbon glass (SF 411047; SU 11028), made of white, blue, violet, and brown colors, can be attributed to an Isings 3 form ribbed bowl dating to the late 1st c. BC or early 1st c. AD, a residual find probably deriving from the initial phase of occupation of the site and redeposited in this context.

From topsoil contents come the following diagnostics: SF 411005 (SU 10000), yellow-green fragments belonging to the base and body of a flat-bottomed, footless cylindrical flask or bottle whose profile curves gradually upward. Additional finds include two small fragments of ring bases, one of a colorless vessel with a degree of iridescence (SF 411004), the other a low-set disc of yellow-green glass (SF 411016). One rim fragment of dark blue-green glass is not measurable but has the same degree of pitting as SF 411036 above. Fragment SF 41114 (SU 11010) comes from a beaker with slightly outturned rim, colorless, with incised parallel lines 0.5 and 0.9 cm below the rim. Also present is SF 411026, a body shard of a colorless beaker, free from bubbles or encrustation, with a hexagonal pattern in relief on the exterior surface. Such decoration can be found on footed goblets of the form AR 45.1–2 = Isings 21 (Rütti 1991: tab. 52.1203, 1205, or 1206), datable from the Flavian period to the 2nd c. AD. One rim fragment (SF 411001) probably belongs to a Roman-period bottle. Topsoil body shards (n=12) from Area III are largely colorless and blue green.

10.11 Building Materials (AA)

The "cubilia" or diamond-profiled shaped stones of the *opus reticulatum* were carved of marly limestones, probably selected and carved from the cobbles and boulders of the Orcia and Ribusieri riverbeds, directly adjacent to the site. A single example was carved of "macigno" sandstone, outcropping at an aerial distance of ca. 8 km to the SW. The mortared walls in Area II and Area III were composed principally of unworked examples of those same marly limestones (Fig. 10.76), probably collected directly from the adjacent riverbeds, with the occasional presence of conglomerate/crystalline sandstones transported by the rivers from the outcrops near Montenero, located some 6 aerial km to the E (Fig. 10.77).

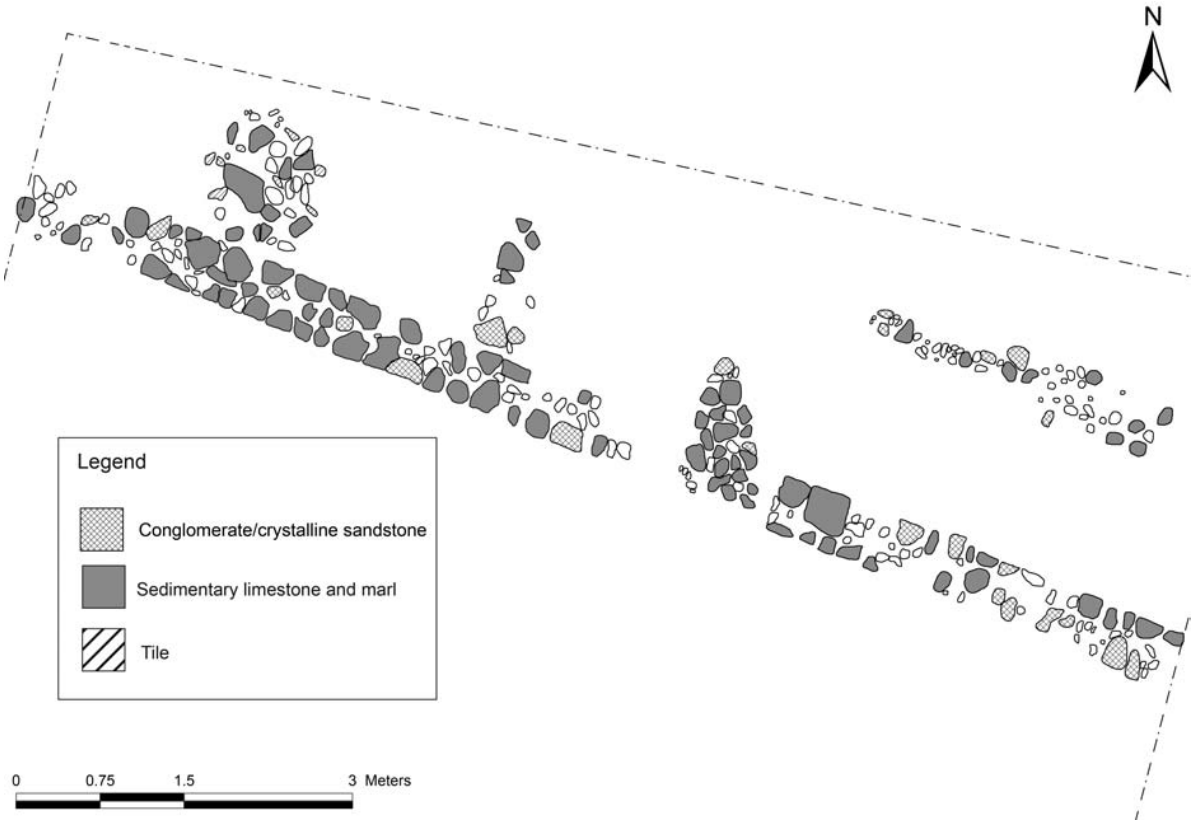


Fig. 10.76 Marzuolo, Area II, plan showing various types of building stones (ERZ/MS).

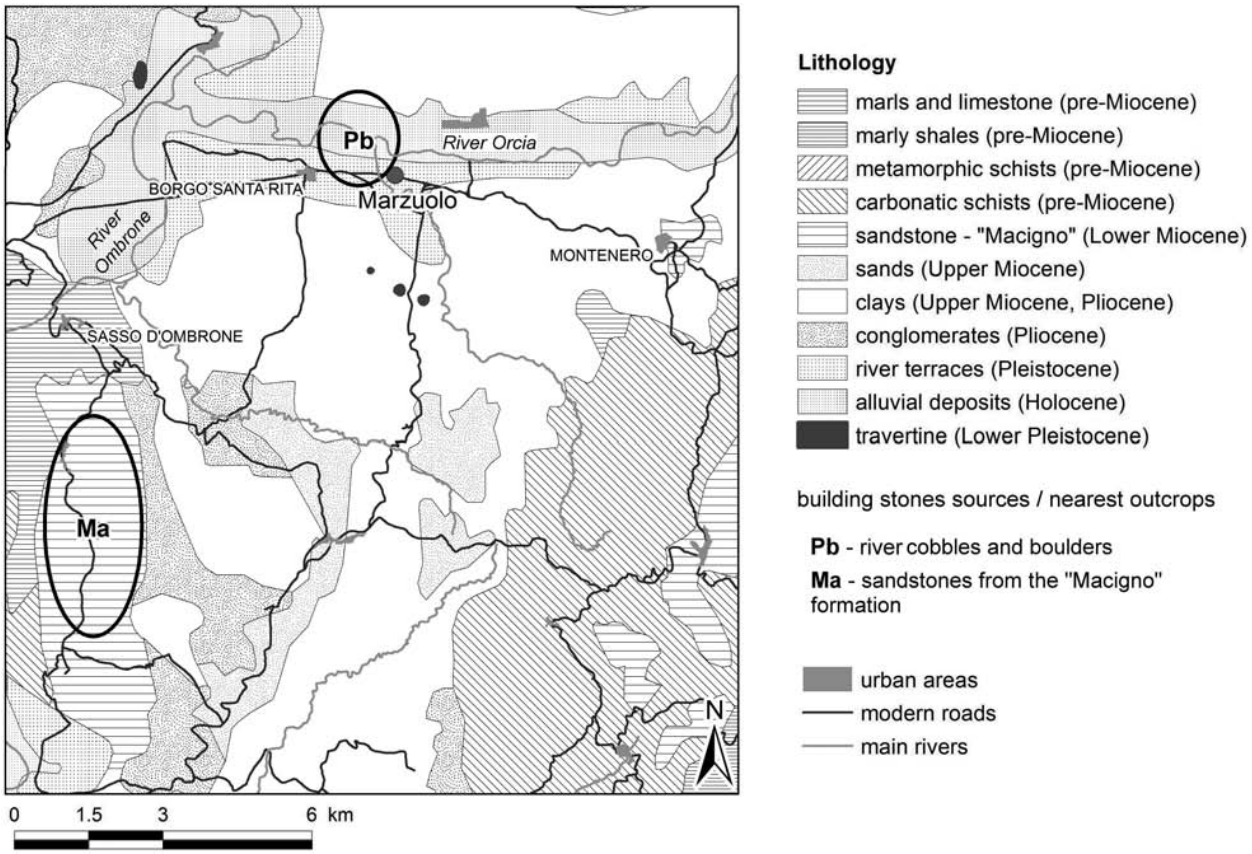


Fig. 10.77 Marzuolo, map showing nearest outcrops of building stones (AA).

10.12 Discussion (KB)

Unlike the village hypothesized from the remote sensing data, the site of Marzuolo appears to be a planned site of at least 2 ha for the production of Roman fine wares. The origins of the plan date to the early Augustan period, around or just before 30 BC, judging from the earliest dumps in Area III that provide the *terminus post quem* for the construction of Structure 4. The alignments of this room are followed throughout the site, although as noted above, the chronological evidence for Area II is absent. It is possible the *opus reticulatum* building was constructed at this time, although as noted above, the evidence for the dating of that building is tenuous, there is no evidence of Augustan period activities there and the stratigraphic evidence suggests a later date. Thus, it would seem that the eastern and central parts of the site at least were constructed in this period when the site begins dedicated production of ceramics.

Two of the three excavated areas of the site were dedicated at specific moments to the production of Experimental or Italic sigillata—Areas I and III. It would appear that the site was planned with that purpose in mind. That production, however, took place in different buildings within the site in different moments, with no seeming overlap between them. Area III saw the first phase of production, which coincides with the first attempts in Italy to produce Italic sigillata: the larger kiln to the S of Structure 4 shows clear signs of experimental firing, while the dumps to the N of the building revealed a large quantity of Experimental wares that show signs of misfiring and other aspects of experimentation. Only very tentative evidence, mostly from wares found in other sites, point to a possible production phase between 10 BC and 50 AD, perhaps somewhere near Area III. Area I reveals the later, more developed phases of sigillata production, around 50–70 AD. That ceramic production took place between these two periods would seem likely but was not demonstrated by our limited excavations.

The role of the *opus reticulatum* building in the contexts of this planned, ceramic production facility merits comment. The presence of *opus reticulatum* masonry in Tuscany is only rarely found outside cities (Nicosia and Poggesi 1998:203) and some luxury rural villas (the nearby Santa Marta villa has it in combination with *opus testaceum* in the later 1st c. AD phases of its bath building, for instance) and, thus, simply the presence of the masonry here is suggestive of both significant investment and probably elite involvement (cf. Van Oyen 2020). The function of the building remains mysterious. The portions we excavated had no floors or other indications of its function, although the built-in pipe connecting Rooms 1 and 3 points to craft functions. The discovery of stone tesserae and window glass mostly in the plow soil of this area indicates mosaic floors and more luxurious spaces lie unexcavated nearby. Further excavations have failed to uncover such a residence and only revealed further spaces of uncertain function or workshops (Van Oyen and Vennarucci 2016, 2017). Regardless of its interpretation, the presence of the masonry, the large size of the site and its planned nature all suggest both a significant investment and the intent to carefully manage and monitor that investment.

Why was this ceramic production site built here? Unlike known Italic production centers, the site is not positioned on a major road or navigable river (cf. Kiiskinen 2013). As noted above and in Chapter 17, a routeway of some kind ran through this area, connecting the area zones E and the coast to the W. While water, sand, and clay are all available within 10 km, these resources are not distinguished by their abundance, quality, or accessibility versus other spots. Thus, while the area generally is not inimical to ceramic production, strict rules of market access and transportation costs would seem to indicate more favorable spots closer to the coasts and/or major cities. Two points are worthy of note here: first, as Van Oyen has argued (2016:43–44), communities of knowledge played important roles in the siting of ceramic production facilities and their development. Communities of knowledgeable craftspeople in the area may have affected why potteries developed where they did. Personal choice in investment is another: landowners interested in investing in ceramic production would have used land they owned—which need not have been the optimum land for such activities. None of these factors is, of course, excavatable.

The discovery of an Italic sigillata workshop at Marzuolo adds to the corpus of known production sites and is the only one aside from Scopietto to have preserved production structures and kilns, and to have been scientifically excavated. According to one strand of scholarship, Marzuolo would be termed a "branch workshop," an offshoot of larger so-called

manufacturing center near Arezzo or Pisa, as the appearance of at least one or two possible persons whose dies are to be found in Arezzo would suggest. This notion of branch workshops has given way more recently to the notion of more independent, itinerant producers, who might set up production leases with a variety of landowners over time, bound by shorter or longer term contracts to provide pots and labor, while the landowner would provide facilities and raw materials (Fülle 1997; Oxé, Comfort, and Kenrick 2000). As Van Oyen has argued, this situation does not quite fit Marzuolo with its planned, aligned structures, its expensive, if somewhat primitive *opus reticulatum* building and technical experimentation in its earliest phases (Van Oyen 2020). Regardless of its contractual organization, Marzuolo seems to have attracted itinerant producers, like Manneius and Umbricius (who either already had or would work together at Torrita di Siena) as well as locals.

The interest of Marzuolo for the project lies principally in what it reveals about the heterogeneous experience of Roman rural dwellers, in this case precious insights into rural industries and their impact on their locale, including everything from seasonal labor to vegetation and diet. In this context, it is important to highlight what may be the different contexts for the 30–10 BC production phase from the 50–70 AD. The evidence from the earlier phase, concentrated entirely in Area III, revealed small-scale production—two very small, so-called light-bulb kilns and a somewhat larger rectangular kiln. The dumps in this area were composed of mixed domestic trash and ceramic rejects—although the latter could also have been in domestic use. The small finds (pins, rings, loom weights) describe a community that lived in or near Structure 4, in close proximity with their work. The charcoal remains from these contexts likewise find local wood in use for either kiln fuel or domestic fires, while the limited macroremains very tentatively indicate a nearby garden and harvesting of local edible fruits. Animal remains derived from both traction (cattle) and dietary animals, although all were ultimately consumed as meat. The relatively high quantities of cattle, probably stabled locally and consumed at the end of their work lives, likewise suggest close proximity of production, transport, stabling, and domestic activities. The data from Phase 1, then, describes a smaller scale enterprise, largely local in its labor and resource base.

As indicated in the study by Vaccaro, Capelli, and Ghisleni (2017) and summarized above, ceramic products of earlier phase(s) were marketed locally. Fabrics similar to those from Marzuolo were identified at three sites excavated by the project, Pievina, Case Nuove, and Tombarelle, and four survey sites. Thus, in at least one period, the site acted as a distributor of consumer goods. Proxy data from faunal evidence likewise suggests the effects of this distribution: higher numbers of cattle and equids used for transporting wares and a cobbled surface in Area II, which suggests concentration of animals for loading or unloading, point to a center of burden animals, while that same data indicates herds were managed locally.

The second phase in Area I (50–70 AD) seems to suggest an increase both in scale and specialization. The quantity of ceramics is very large, 250 vessels from SU 10093 alone. While we never definitively located the kilns, the size of the excavated area, plus the size of the overall magnetometry anomaly, suggest multiple large kilns. The small finds from the area are almost exclusively tools and bronze vessels likely used in the production process with virtually no personal objects. The recent excavations by Van Oyen and Venarrucci have uncovered a blacksmith's workshop, further suggesting the tools may have been produced on site. All of this suggests the workforce was now housed somewhere else, at some distance from the production facility, either between Area I and II, or down slope at TU 402/4003.

Three individual ceramic producers from this phase, Manneius, Umbricius, and Rufrenus, are known from other sites, and Manneius and Umbricius seemed to have worked together at Torrita di Siena. Each seemed to have specialized in specific forms. The stamped products from these producers are found in Chiusi, Rome, Aquileia, and beyond (Oxé, Comfort, and Kenrick 2000: n. 946). While we cannot know if these stamped pots were produced at Marzuolo or at these producers' other work sites, it would seem likely that Marzuolo wares circulated widely. At the same time, these 50–70 AD wares were not located in other local sites. This may have been partly, if not wholly, due to an absence of sites of this date excavated by the project and the difficulty of identifying these wares by thin section.

The environmental data likewise point to a highly specialized Phase 2 site with a very different relationship with its plant environment than other sites

in the project. Some of the wood used in this phase comes from further afield, almost certainly the slopes of Monte Amiata. The tamarisk, beech, and fir specimens found as pollen and/or macrocharcoals were most likely part of consignments intended to fuel the great kilns. The very low AP/NAP ratio (12/88) points to a local landscape without local woods, further evidence of local deforestation and reliance on fuel brought from more distant sources. The quantity of cereals (9%) in Phase 2 contexts are some of the highest in the study area and suggest more specialized dedication of crop resources to cereals than we have seen elsewhere, possible to feed a more locally concentrated population.[4] The concomitant low quantity of Cichorieae points to less land dedicated to/in rotation with pasture in this period. Faunal remains neither confirm nor deny this hypothesis, although cattle decrease somewhat while pig increases, and younger cuts plus the admixture of some wild animals suggest a more diverse diet with elements of "elite" foods.

During this later period, Marzuolo also seemingly acted as a distribution center for imported and possible local foodstuffs. The 50–70 AD amphorae deposit in Area I suggests that the site served as a nexus for the distribution of imported wine principally, but also fish sauce. The probable presence of vineyards near the site (noted in both pollen and macroremains from this period) and the notable number of local flat-bottomed amphorae may even indicate production within the immediate area or site as well as distribution. It is noteworthy that in its apogee, the other well-excavated Italic sigillata production site at Scopietto also served as a distribution nexus for imported foodstuffs (Bergamini 2007a).

The final phase of the site in the 2nd–3rd c. AD is somewhat mysterious. No ceramic production facilities were uncovered, yet the site underwent a major restructuring nonetheless. The *opus reticulatum* building was deliberately backfilled, suggesting a desire to regularize and flatten the site. Three large cuts placed at NNW/SSE—one slicing through in Room 1 of the *opus reticulatum* building, a second through Area II, and the third represented by drain 11004 in Area III—seem to proceed or date to this period. Drains or furrows suggest the large-scale realignment of the abandoned site for agricultural or other purposes.

Judging from personal objects, diet, and environmental data, the site returns to a smaller-scale, domestic occupation. The small finds, from dress pins and needles, point to personal adornment and domestic labor. Animal consumption habits seem broadly similar, although the collapsing Structure 4 shows a return to cattle as both traction and meat, along with a significant presence of equids, seemingly for transport or traction. If the pollen from Area III is taken as more representative of local realities than that from Area I, agricultural exploitation returns to the locale's "norms" with lots of pasture and limited cereal production. Forestation rates, however, remained low, possibly a legacy of the site's industrial past.

At the same time, this smaller, more domestically oriented Marzuolo retained some functions of its past as a central place. In a time when sites are scarce and imported ceramics equally so, imported amphorae were numerous suggesting important extra-locale connections. Local amphorae and continued evidence for grape pollen and seeds seem to indicate possible continued local wine production. The site's few coins mostly derive from this period, pointing to small scale exchange, possible around these products.

In all its phases, albeit in different ways, Marzuolo acted as both a center of habitation and a node in a network of humans and goods on the move. For three centuries, it supported a human population, initially innovators experimenting with the early sigillata production (Van Oyen 2020) and later specialist producers who would have journeyed from other ceramic centers to work here for a period of time. The size of the site and the relatively heavy emphasis on grain production in this period indicate this was a sizable population.

The relationship between the ceramic production site and its human communities in the locale would been mediated through exigencies not only of resources, but also labor. Specialized Roman fine ware production implicated a complex community of specialist, often itinerant potters, potters-in-training, specialists in clay refinement and kiln management, blacksmiths for tool production and repair, and many unskilled laborers for clay extraction, fuel and water transport. At least some of the workers in the pottery's first phase seem to have lived at the site in Structure 4, while in possibly both phases some of the producers (Sextilius(?), Manneius, Umbrichius, and Rufrenus) worked at other sites in addition to Marzuolo. To this itinerant community of specialists was added the many visitors to the site: locals

buying ceramics as well as purchasing the wine and olive oil stocked (and perhaps produced) here; *negotiatores* transporting larger quantities of ceramics in bulk to nearby markets or farther-off cities, who may have been the same people carrying amphorae-born foodstuffs to the site for its own use and that of the nearby rural population. These people would have carried Marzuolo's goods outward, to the local locale and beyond.

There are good reasons to think that this complex community would have had a pronounced seasonal character (cf. Murphy 2015). At the fine ware factories at Graufesenque, kilns were operating predominantly between March and October (Marichal 1988:98), and ethnographic studies have similarly found that most cultures focus ceramic production in warmer months when high kiln temperatures are easier to achieve, drying completed vessels would have been quicker, and transport of the finished products on hard roads eased (Arnold 1985:61–98). Other activities (e.g., clay extraction, wood cutting) might have been focused in the "off" season of later fall or winter. Were this true at Marzuolo, workers from the locale would have clustered here in the summer, moments when demand for agricultural labor would also have been high, while slack moments in the agricultural year would also have been slack at Marzuolo. Thus, the labor opportunities presented by ceramic production may have clashed somewhat with local agricultural needs, exacerbating annual labor shortages and surpluses (cf. Arnold 1985:99–108).

Even after the site's *raison d'être* as ceramic center had ceased, it is remarkable how it continued to act as both habitation and distribution center. In the 2nd–3rd centuries, it was the patterns and memories of three centuries, rather than anything proper to the site itself, that continued to fix Marzuolo as a central place both inside the locale and without.

NOTES:

10.1 Portions of this chapter are modified from Vaccaro, Capaelli, and Ghisleni (2017).

10.2 The letters MN are always readable whereas the expectable ligature MˆA before N (Oxé, Comfort, and Kenrick 2000:1099) is not visible in our specimens. This would attest to a more simplified stamp with only the consonants MN.

10.3 Lithology based upon the data of the Regione Toscana.

10.4 Cereal chaff could also be used as a fuel (Möller and Rieger 2019), but no rachis segments were found in the macroremains from the kiln phases.

11

Tombarelle

11.1 Situation (AA, MG)

Like three other sites in the project (San Martino, Poggio dell'Amore, and Podere Terrato), Tombarelle is located in the northern part of the township, south of Borgo Santa Rita in the so-called Piani Rossi area. Again, the area is a rolling landscape dominated by Upper Miocene-Pliocene clays. Additionally, Tombarelle is located upon the main divide between the watersheds of the rivers Orcia and Ombrone. Drainage to the Orcia is through the Fosso Vallanzo and to the Ombrone through the Fosso Infernaccio Merdancione. The latter is a final tributary of the Torrente Trisolla (Fig. 11.1).

The site lies on a north-facing hill, whose top lies ca. 174 m asl. The geological features of this hill may shed some light on its function and will be discussed more fully below.

The current use of the site complicated both the interpretation of the survey data and the excavation: at mid-slope the current owner had excavated a pool for depositing agricultural waste, while on the hilltop, olive waste was deposited over parts of the site.

11.2 Remote Sensing (MG)

Ghisleni's survey identified the site in 2008. It consisted of 12 individual scatters (TU 235–244, 412 and 413) disposed both over the north-facing slope, as well as adjacent west-facing fields (not excavated) (Fig. 11.2), for a total area of ca. 1.6 ha. Furthermore, as part of TU 236 and set at the highest point of the hill was a standing structure. Sunk some 3 m beneath current ground level and still bearing some traces of its barrel vault, this structure was tentatively identified as a Roman cistern. The current landowner said the structure had been used as a shelter during WWII and claimed to have cleaned the structure of debris in the past.

The scatters produced a wide variety of chronological materials: three scatters (TU 236, 240, 243) yielded generic Roman materials, TU 237 and 244 additionally produced Italic sigillata, while TU 235 produced Black glazed ware and Italic sigillata. Three of the scatters (TU 238, 241, 242) yielded material of late antique date, while three (TU 238, 239, 242) additionally produced some medieval material. TU 412 exceptionally produced material from all periods and the adjacent TU 413 from imperial and medieval periods. Sherd density varied from 15–20/m^2 (TU 235 and 412) to 2–3/m^2 (TU 240/244). Given the size and dispersed character of the scatters, the site was labeled a "village" or agglomeration of houses and service buildings.

As was discovered at Pievina, these scatters could also be a collection of agricultural buildings and possible habitation, something closer to a farm. Tombarelle was selected for excavation both to further

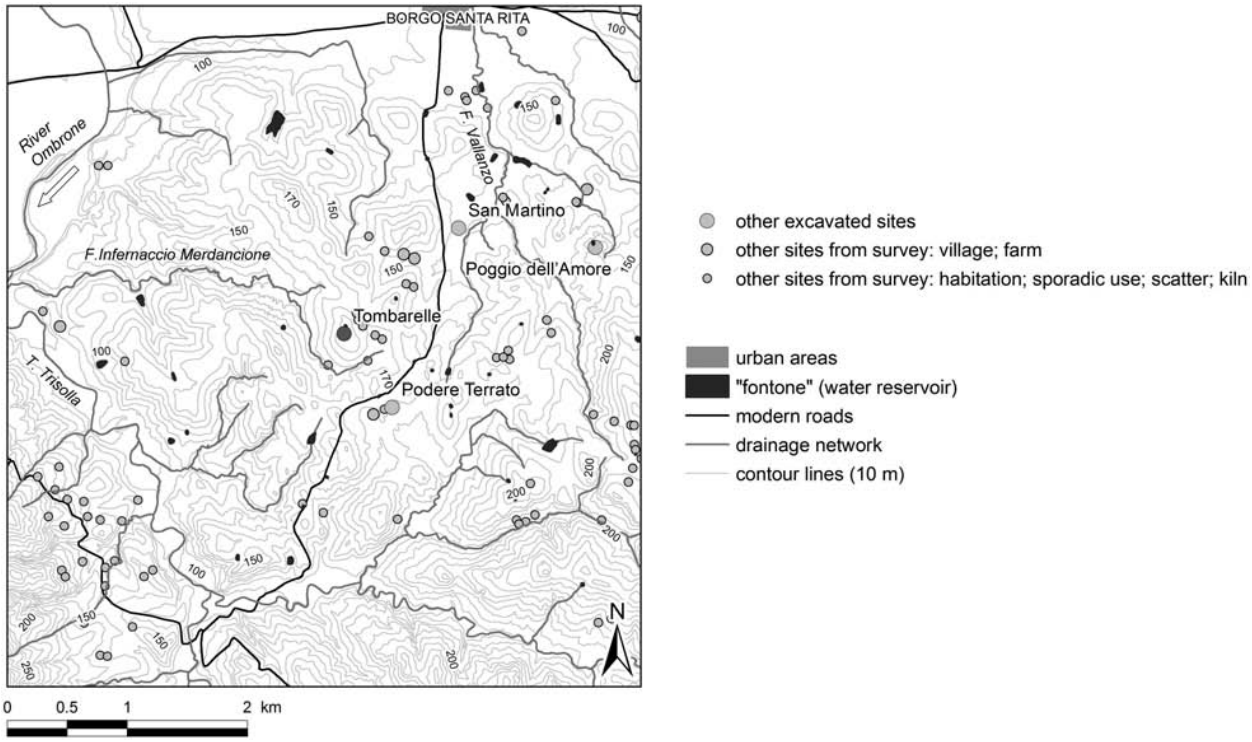


Fig. 11.1 Tombarelle, general topography and Roman sites (AA).

test this hypothesis and to provide more information on this site-type, as well as to provide more data on the late antique period in the area.

For a variety of logistical reasons, this was the only site in the project *not* subject to geophysical prospection before excavation: in addition to equipment problems, it was felt that the modern excavations at mid-slope, the large amounts of agricultural debris, and the steepness of the slope below would produce inconclusive or unreliable results. In the absence of this information, four of the most coherent scatters were selected for excavation, with a focus on the late antique materials. Large portions of TU 236, 413, 238, and 241 were excavated: a bulldozer was used to remove topsoil until archaeological levels were encountered which in the case of TU 413 and 236, involved considerable exploratory trenches (see Fig. 11.8)

The scatters to the W, particularly TU 412, lay in a different field owned by multiple proprietors. The potential difficulty of obtaining permits led us not to excavate in this area—a decision that greatly impacted the interpretation of the subsequent results. As will be discussed below, the excavated areas represent four discontinuous moments of human occupation, the possible satellites of a site that lay unexcavated beneath TU 238 and 412.

11.3 Excavation

Excavation took place in four major areas (Areas I–IV) each of which had distinct, non-overlapping chronologies and functions. Aside from the cistern, no structures were encountered, only a series of surfaces and/or fills. As a consequence, the function, or better, functions, of the site in any given period remains unclear.

11.3.1 Area I: Phase 1? and 4

This area, comprised of portions of TU 237 (Fig. 11.2 above) lay at the top of the hill, and was partially covered by trees. Excavation here involved the removal of undergrowth, cleaning to expose the top walls of the structure (SU 16002), and two trenches—one at the top (Trench 1) and one inside the structure down onto its floor (Trench 2) (Figs. 11.3–11.6).

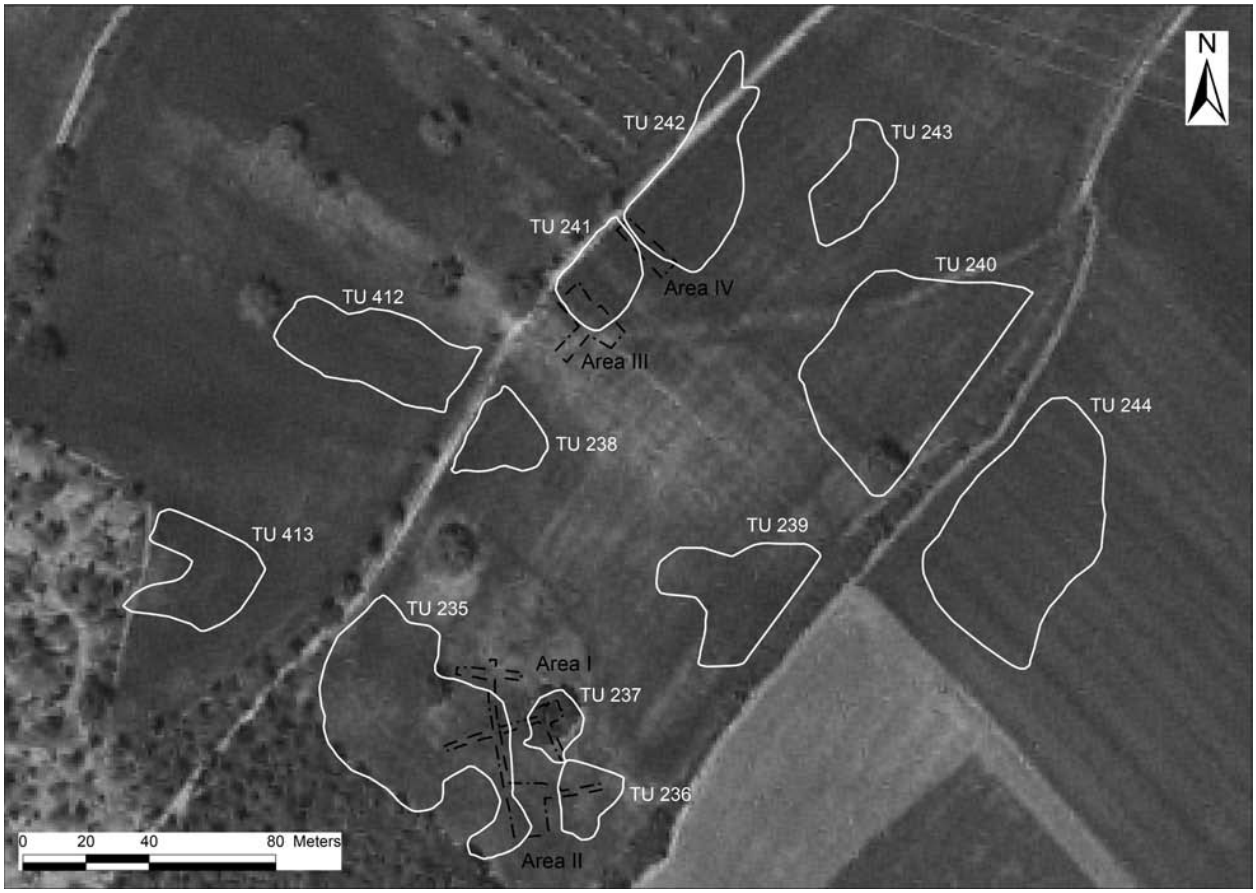


Fig. 11.2 Tombarelle, surface survey overlaid with excavation Areas (ERZ/MS).

Trench 1 on the W side of the structure revealed aspects of the structure's construction. With interior measurements of 5.5 x ca. 3 m, the structure was excavated into the hill to a depth of ca. 3 m, with walls of ca. 0.75 m thickness where they broke the surface. Remains of a barrel vault were visible particularly on the SE side. Masonry was composed of equally sized ca. 10 cm stones set in a hard mortar.

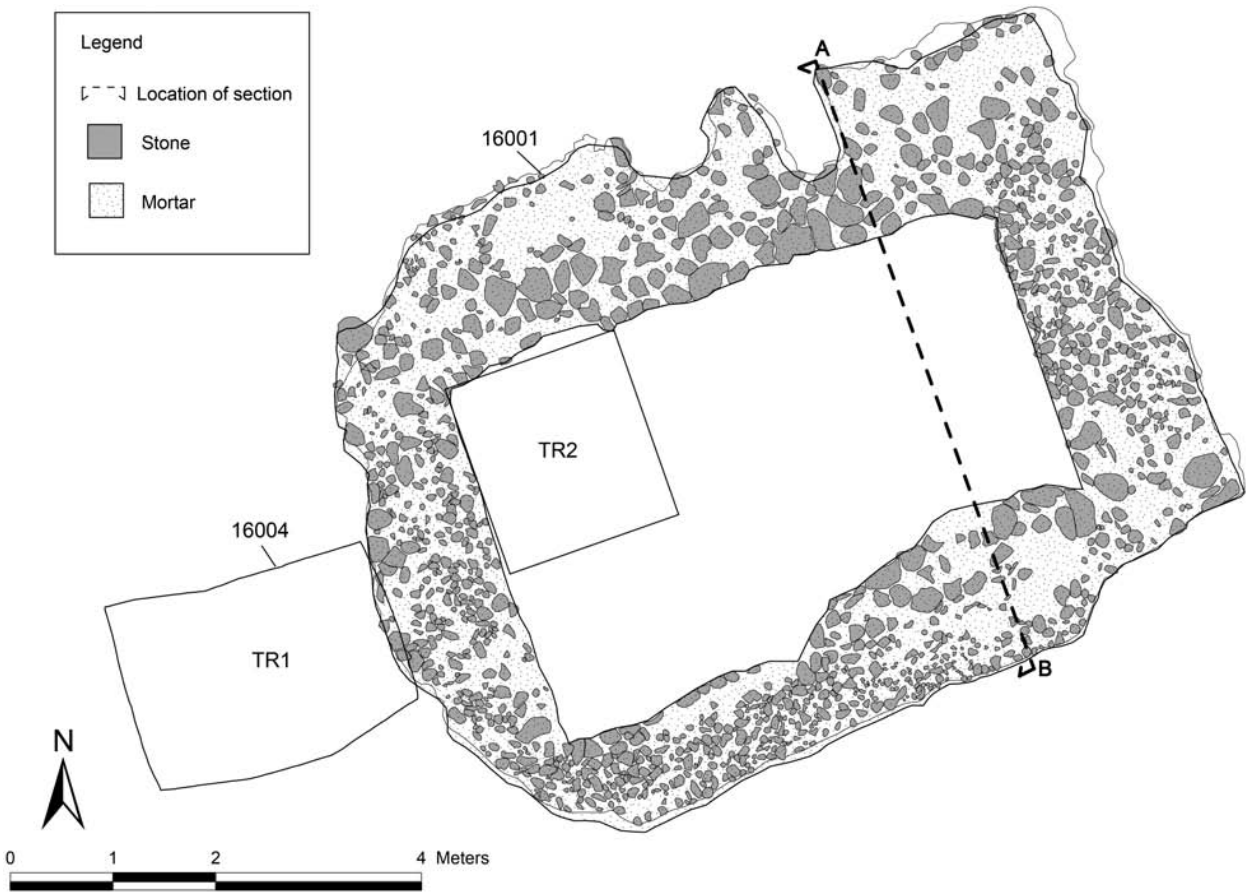
Trench 1 also revealed the hard clay of the surrounding geology. No foundation cuts were visible: upper strata (SU 16001) yielded medieval through 19th c. materials while lower strata (SU 16004) produced generic Roman material.

Trench 2, excavated inside the NW corner of the structure, was extended until it hit floor level. Modern rubbish at the surface gave way to an undisturbed context (SU 16021) in the corner comprised of medieval material. Removal of these strata exposed a thin coat of *opus signinum* cladding the walls, preserved again only in the corners (Fig. 11.7). This *opus signinum* was presumed to have covered the whole of the structure. Exposure of the floor likewise revealed a pavement of *opus signinum* in good repair.

The date/function of the structure was much discussed: its morphology, particularly the steep pitch of its vault suggested a medieval tower as did the accumulation of medieval material on its floor. But the presence of *opus signinum* almost certainly points to a Roman origin of the building.

The cladding of walls in this material, its presence at the hilltop and cover with a vault all point to its use as a cistern. The interior measurements, plus a 3 m depth, suggest a maximum capacity of 49,500 liters. As the whole of the floor was not cleaned, it is unclear if water entered via a pipe or drain, or if rainwater collected through a hole in the vault.

Were the structure reused in the medieval period, it is also possible it served as the basement for a tower house, positioned at the hill's apex.



Fig, 11.3 Tombarelle, plan of cistern (SU 16002) (ERZ/MS).

11.3.2 Area II: Phase 1

This area was opened adjacent to Area I, corresponding to an area between and touching on TU 235, TU 236, and TU 237, all to the S of the cistern (Fig. 11.8). A series of trenches were opened with the bulldozer before anthropic levels were discovered to the S of Area I and a large area (13 x 16 m) was opened to explore them. Exploratory trenches in the N part of TU 235 revealed no archaeological levels, while the southern part of that same scatter produced rich, but enigmatic levels (Fig. 11.9). It should be noted that the N parts of TU 235 were possibly disturbed by modern agricultural activities, which may have accounted for the scatter of materials here.

Excavations in TU 235 revealed no structures, but rather a large cut (SU 19014) that was seemingly later robbed and filled (Figs. 11.10 and 11.11). The N edge of this cut is very straight, pointing to a carefully planned intervention, perhaps for the construction of a structure.

The ragged edges of the same cut to the E suggest a possible later robbing episode. In any event, cut SU 19014 was then filled by a major dumping episode (SU 19007, 19011/19015), possibly contemporary with the robbing, containing a significant quantity of stone rubble, mortar, and iron materials, including nails. Later occupation levels (SU 19002, 19003) stretched across portions of this cut, and included a pit and other features, some of which yielded modern materials pointing to intrusion in these upper strata. Many of these strata were rich in ceramics.

The shallow flat cut can be interpreted in a variety of ways: it may have been used as a level site for a building, which was subsequently robbed, although no foundation trenches were found. Alternatively, the area may have been cut and leveled for use as a primary refuse pit. Finally, the cut may have been the result of soil extraction from this area.

Fig. 11.4 Tombarelle, view of cistern from W (SU 16002).

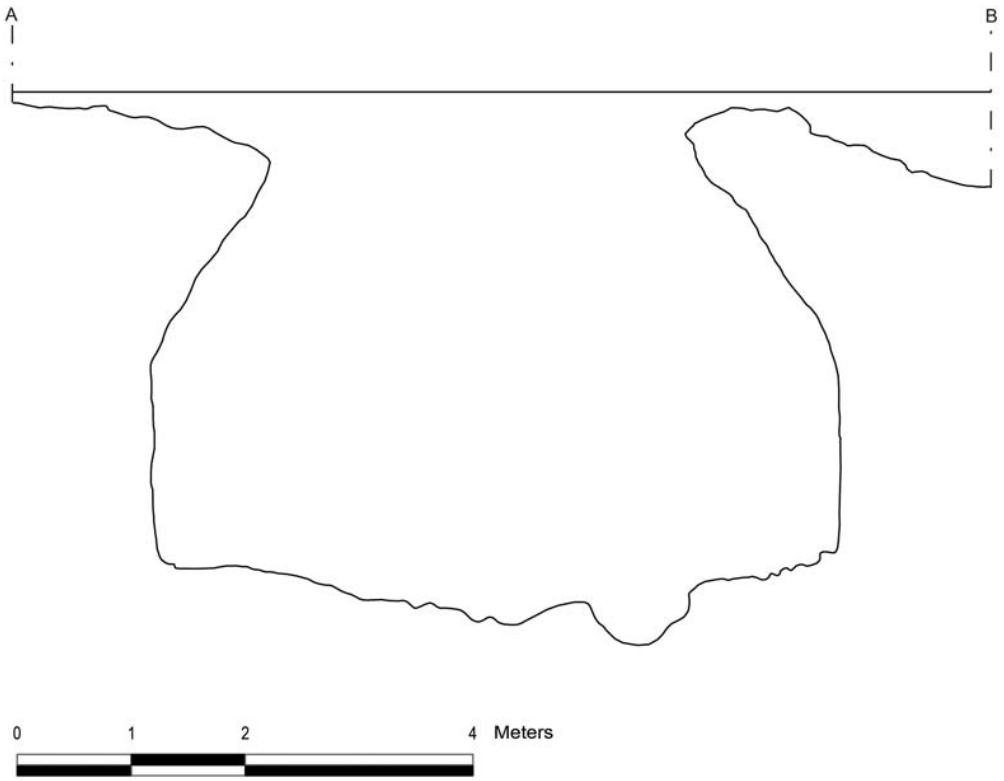


Fig. 11.5 Tombarelle, section of cistern (SU 16002) (ERZ/MS).

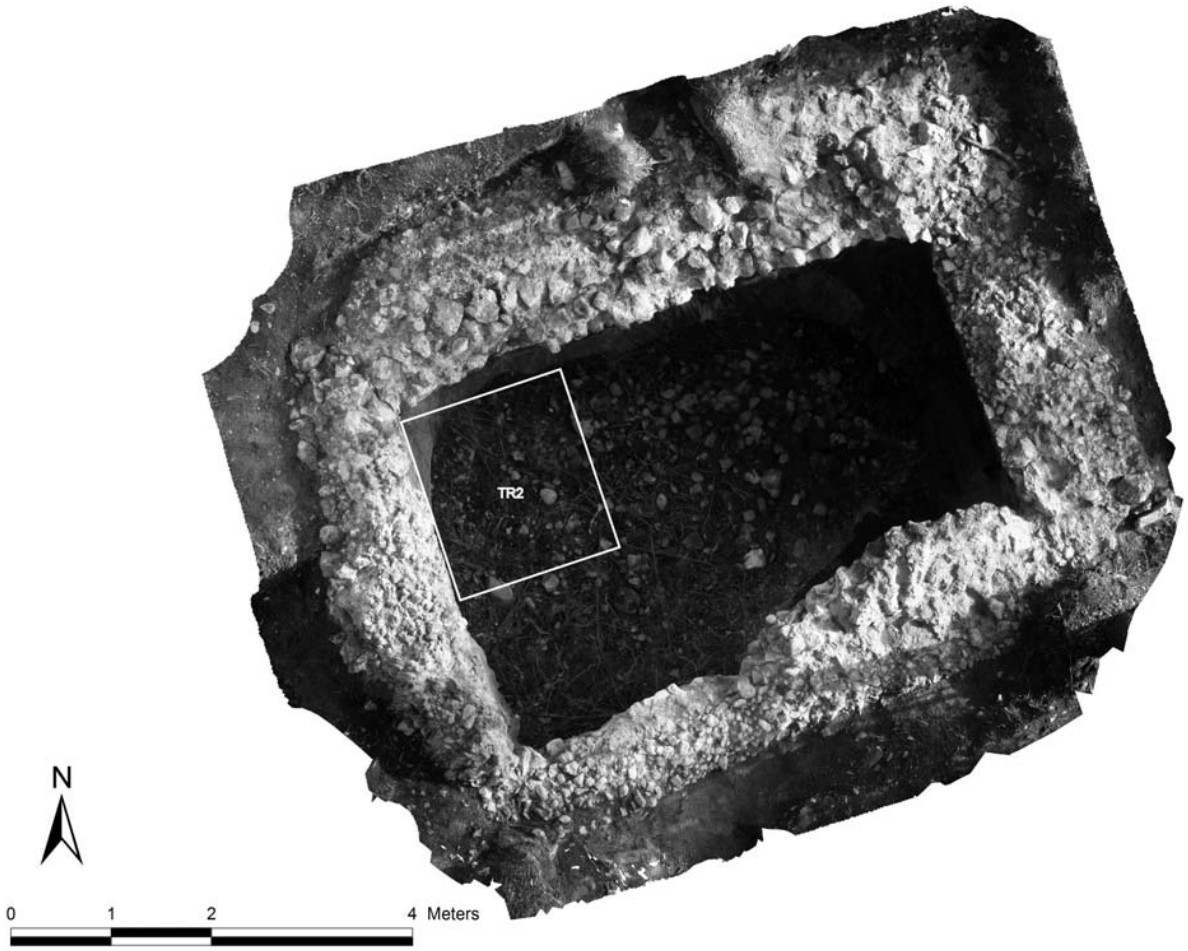


Fig. 11.6 Tombarelle, 3-D photoscan of cistern (SU 16002) (MS).

Fig. 11.7 Tombarelle, Area 1, Trench 2 inside cistern (SU 16002) showing *opus signinum* lining.

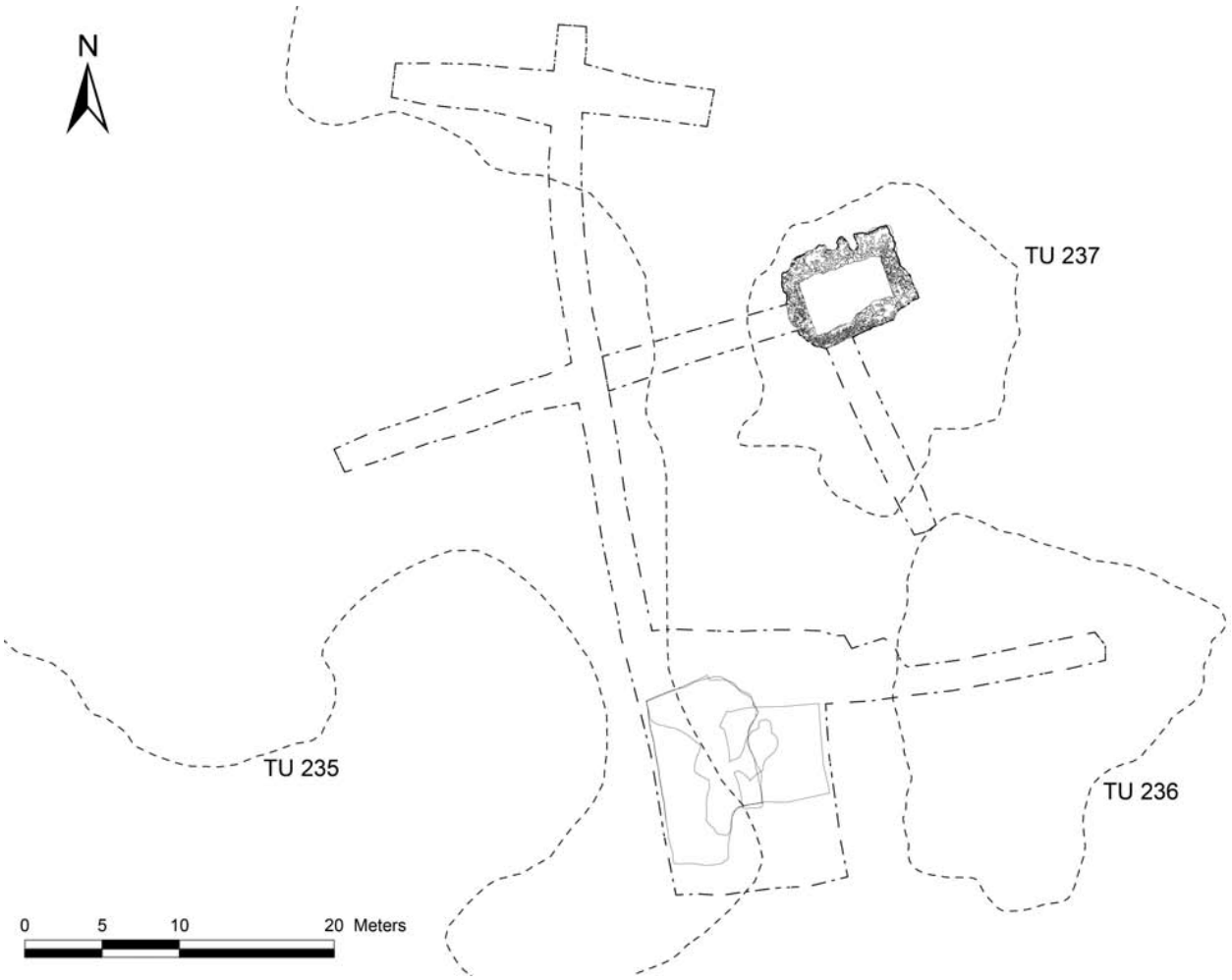


Fig. 11.8 Tombarelle, Area II, overall plan (ERZ/MS).

11.3.3 Area III: Phase 3

A large E/W trench was opened here, overlapping in part with a broad scatter of surface material (TU 241) which extended further E into the field, and W into the road (Figs. 11.12 and 11.13).

Excavations revealed two features, a paved area and a pit. These features were then covered by two, material-rich dumps.

Phase 3.1: Construction of a paved area and pit

The most prominent feature in this area was a ca. 4 x 5 m tile-paved area, bounded by walls and cut into the natural geology (SU 17004) (Figs. 11.14–11.18). Inside the construction cut (SU 17013), a large tile surface (SU 17011), measuring 4.80 x 3.85 m, was bounded on three sides by narrow tiled walls (SU 17014, 17015, and 17021). On the N side, the tiled surface finished with a straight line indicating that the floor was respecting a wall (unseen in excavation but possibly suggested by the presence of SU 17028 similar to the three other sides).

The primary S wall (SU 17021/17010) (Fig. 11.17) was built against the southern upslope edge of the construction cut (SU 17013). The wall was set within this cut along with two very thin backfilled deposits (SU 17016) and (SU 17023). It is likely the natural geology pushed on the southern face of the wall which was the reason for the inclination of the wall itself. The northern face of the wall showed evidence of a technique of reinforcement with an internal mud

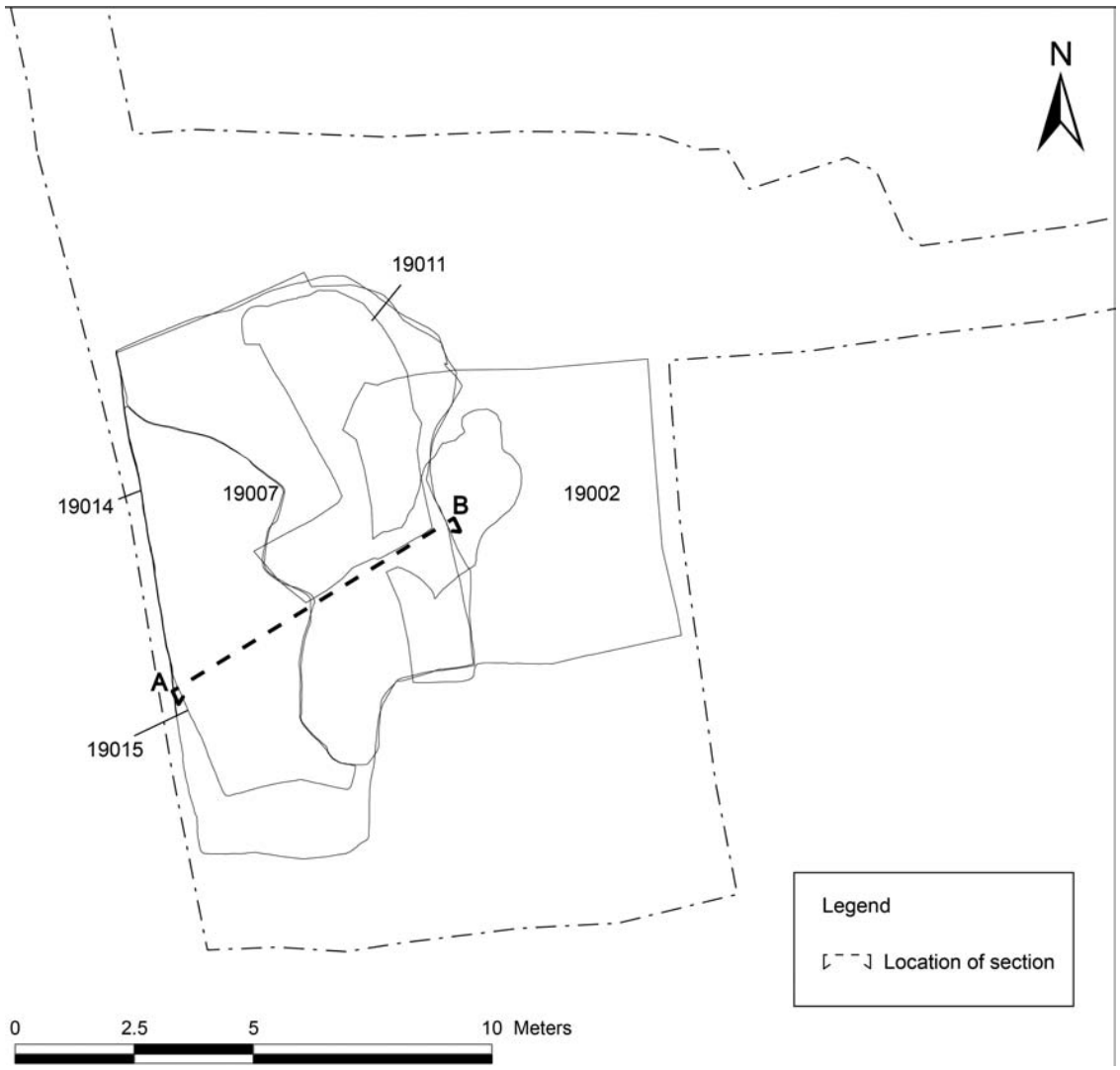


Fig. 11.9 Tombarelle, Area II, plan, excavated remains (ERZ/MS).

packing (SU 17027), covered by tile fragments and finished with a tile face. Walls SU 17014 and 17015 were built against the natural geology on one side and with reused broken brick and tile on the other, with an internal fill of a dark grey mud packing like a pisé. The eastern wall (SU 17012), on the other hand, was constructed from large roughly hewn angular stones and a tiled facing with a sticky pisé fill, very similar to the S wall pisé packing (SU 17027) (Fig. 11.18). This eastern perimeter wall had a foundation trench that cut through the natural geology (SU 17004). Possible signs of a northern SE/NW running wall forming the space's N perimeter were found in the northernmost section of the trench. This possible wall ran beyond the trench extent but looked like it respected the northern edge of tiled surface (SU 17011).

The different construction style of wall SU 17012 may be worthy of comment: the only wall constructed largely of stone with its own foundation trench, wall SU 17012 could have been part of an earlier structure. Belying this however is the fact that its foundation trench was cut into the larger cut (SU 17013) that held the tile floor and the S wall. Thus, despite the differences in construction, it would seem the whole ensemble of walls were built together.

The tiled surface that lay between these walls. was removed in a sondage located at the NW side (see Fig. 11.15). This revealed a lower makeup deposit

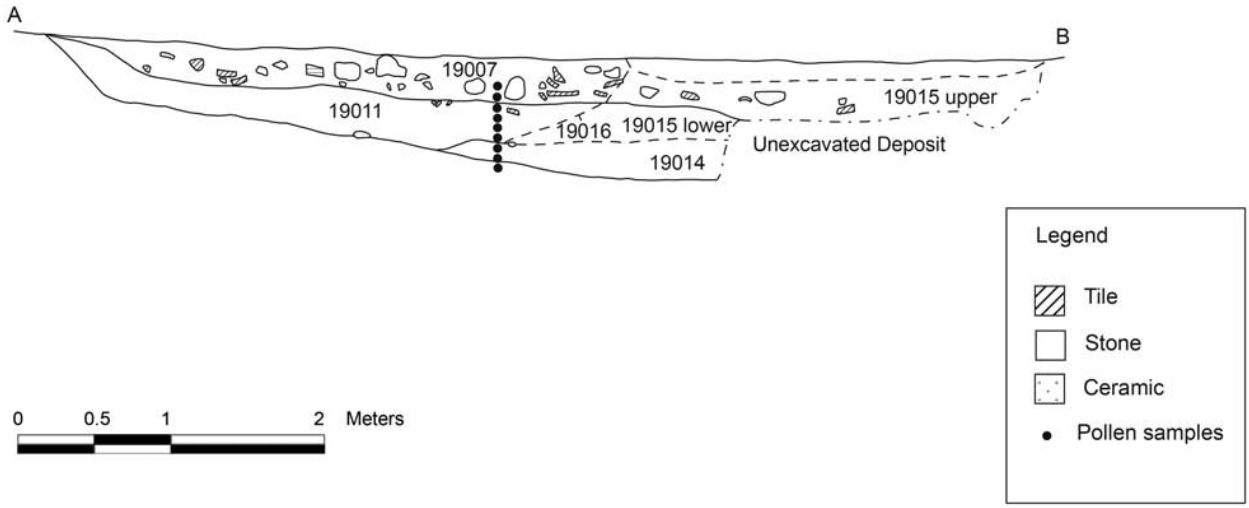


Fig. 11.10 Tombarelle Area II, section, including location of pollen samples (ERZ/MS).

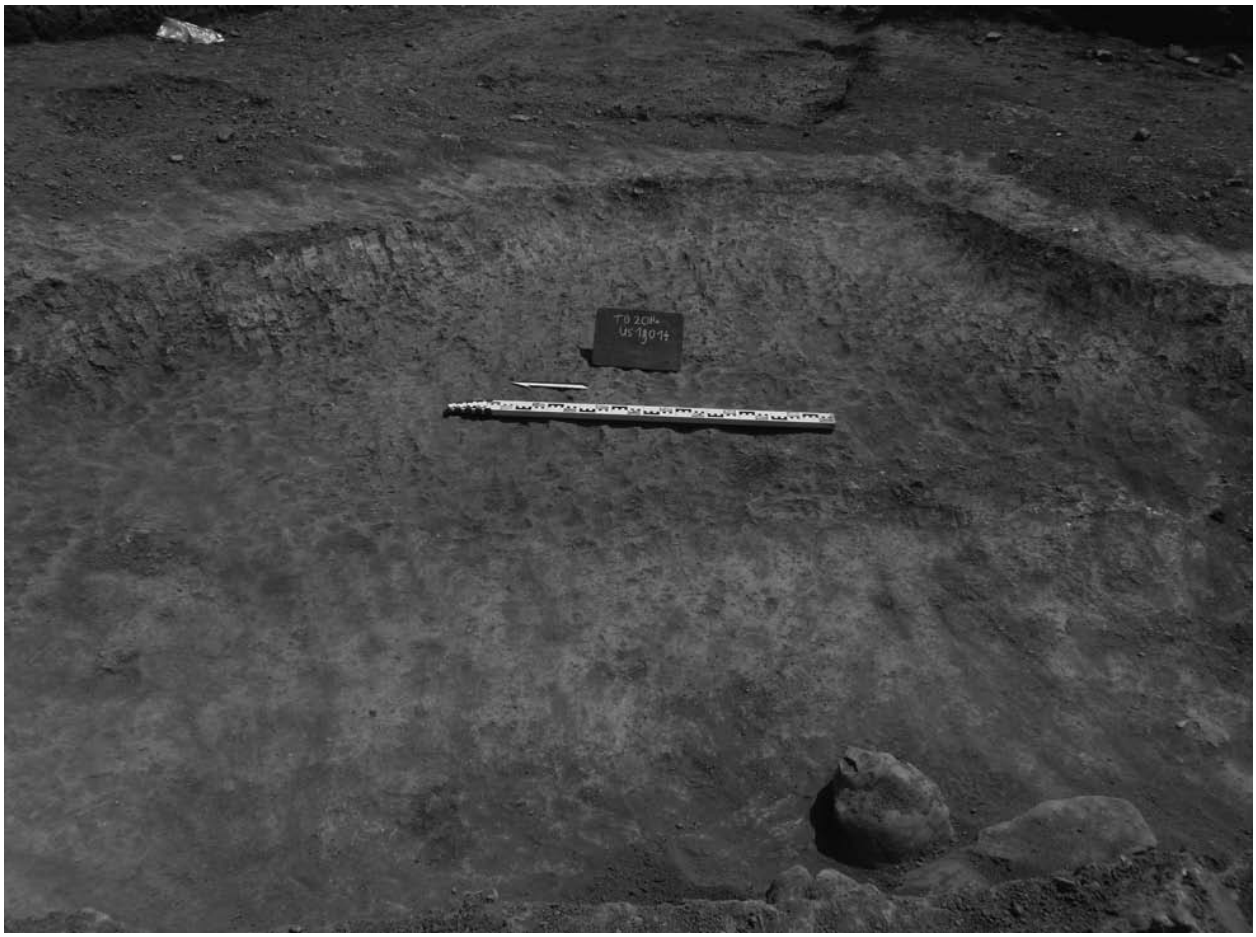


Fig. 11.11 Tombarelle, Area II, view from W, showing edges of SU 19014.

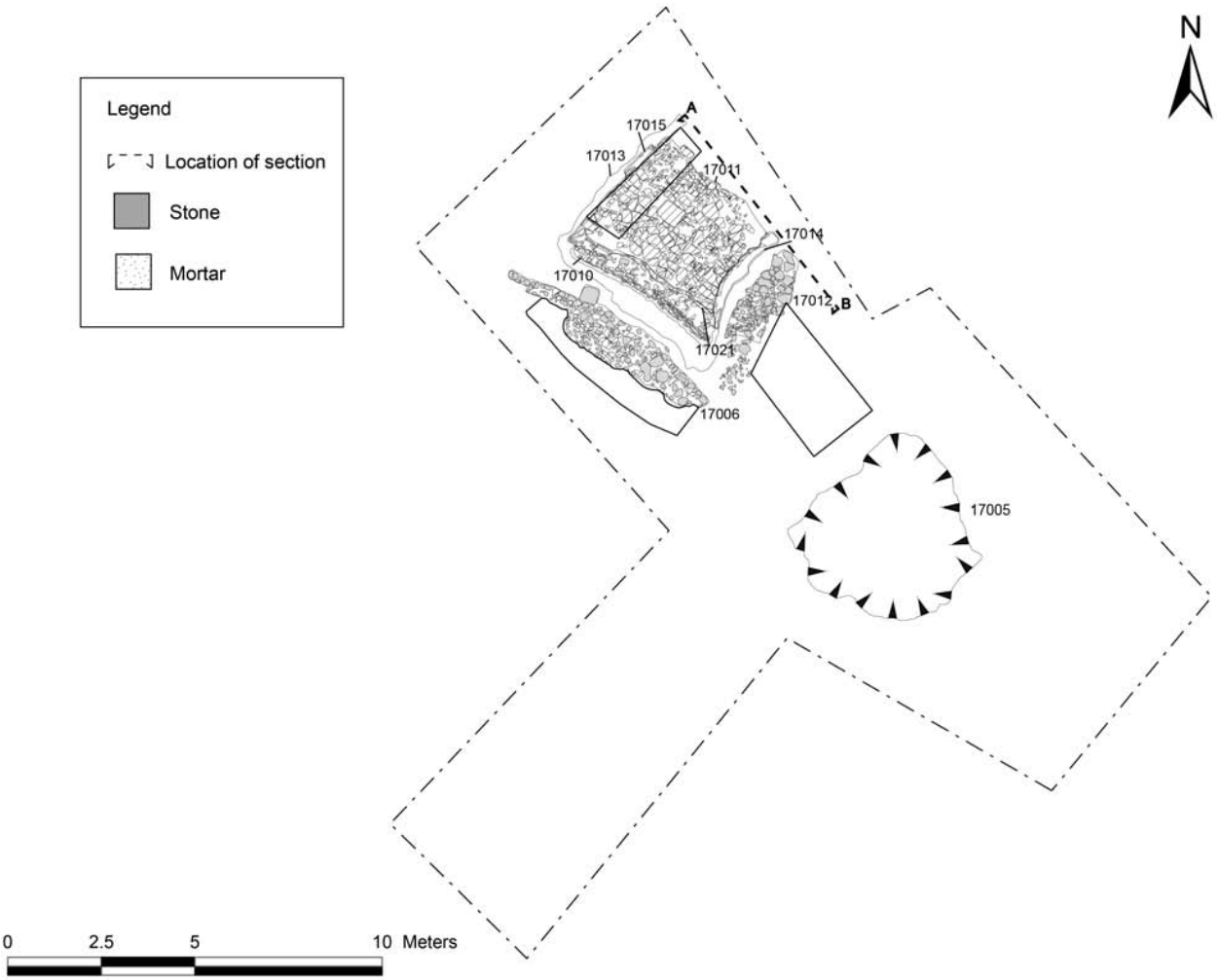


Fig. 11.12 Tombarelle, Area III, overall plan (ERZ/MS).

(SU 17024) consisting of dark organic grey clay mixed with tile fragments and small inclusions of white grey mortar. This sat directly on top of the construction cut (SU 17013) and respected walls SU 17010, 17014, and 17015. Pottery recovered from the makeup deposit was dated to the 5th c. AD and was similar to that pottery also discovered in the mud packing deposit (SU 17027). There were no signs of occupation deposits overlying the tiled floor to show the function or purpose of the space as a whole.

To the S of this walled area and parallel to wall SU 17010 lay wall SU 17006. This wall was also constructed from roof tiles, rectangular, small red brick and irregular stones. It had a foundation trench (SU 17007) cutting the natural geology. It was far deeper in the middle measuring 0.70 m, while towards its eastern and western ends, it suddenly became extremely shallow, sometimes measuring only 0.15 m high. The middle of the wall was also supported by one massive sandstone block measuring 0.45 x 0.38 m. It appeared this construction was built to retain an unknown feature and suggestions were made that it was some form of agricultural terracing. It is of note that this wall was only stratigraphically linked to the tiled room structure to the north by the overlying dump deposit (SU 17003). There was no evidence to confirm whether this wall was built prior to the room or after it. Indeed, it may have been constructed afterwards as a shoring mechanism to prevent colluvial deposits running down slope and compromising architectural integrity. As noted above, there was evidence that the adjacent wall, SU

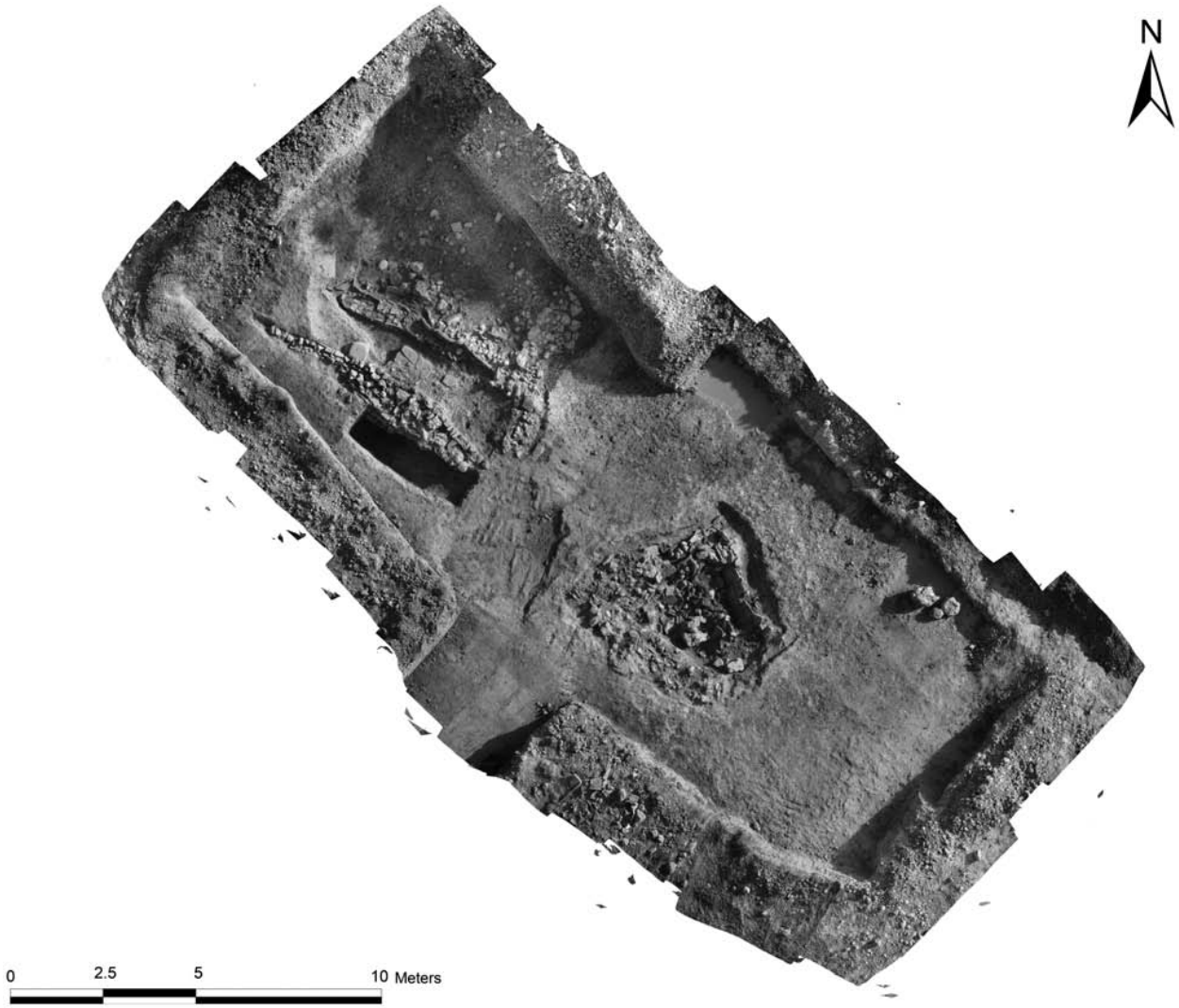


Fig. 11.13 Tombarelle, Area III, aerial photoscan model (MS)

17010, had been deformed by downward movement of the geological strata.

The second "built" feature, a large cut (see Fig. 11.12), lay to the E of the paved area and its walls. Cut 17005 measured 6 x 5.80 x 1.4 m and was roughly circular in shape (Fig. 11.19). It was cut into the only area of the hillside with concentrated clay deposits (SU 17004), a fact that may shed some light on its original function. No use levels were detected inside the pit, which was entirely filled with two fill/dump deposits (SU 17009 and 17002).

These two built features are difficult to interpret. The paved area and its surrounding walls are unlikely to have constituted a roofed structure: two of the structure's "walls" are either distant from the paved "interior" (SU 17006) or seem too thin to be load-bearing (SU 17010). Thus, it is likely that this tiled space was simply open to the air, and the "walls" built to protect it from run-off, and in the case of wall 17006, slumping of the upward hillslope.

While the top of the cut 17005 formed an irregular square shape, the base formed a regular square with a flat base. This square-base, similar to that found at Case Nuove (Ch. 5) indicated that the pit had been purposefully cut. Possible reasons could be clay extraction, water retention, or even deliberate

Fig. 11.14 Tombarelle, Area III, view of paved area from W.

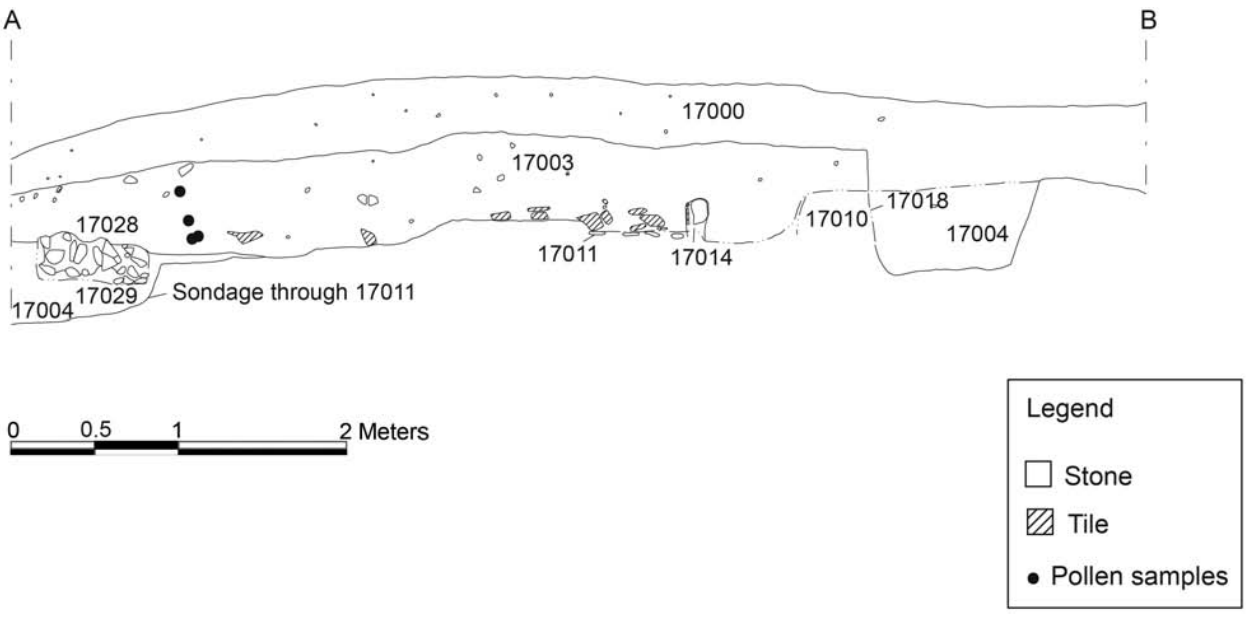


Fig. 11.15 Tombarelle, Area III, N section of paved area, also showing location of pollen samples (ERZ/MS).

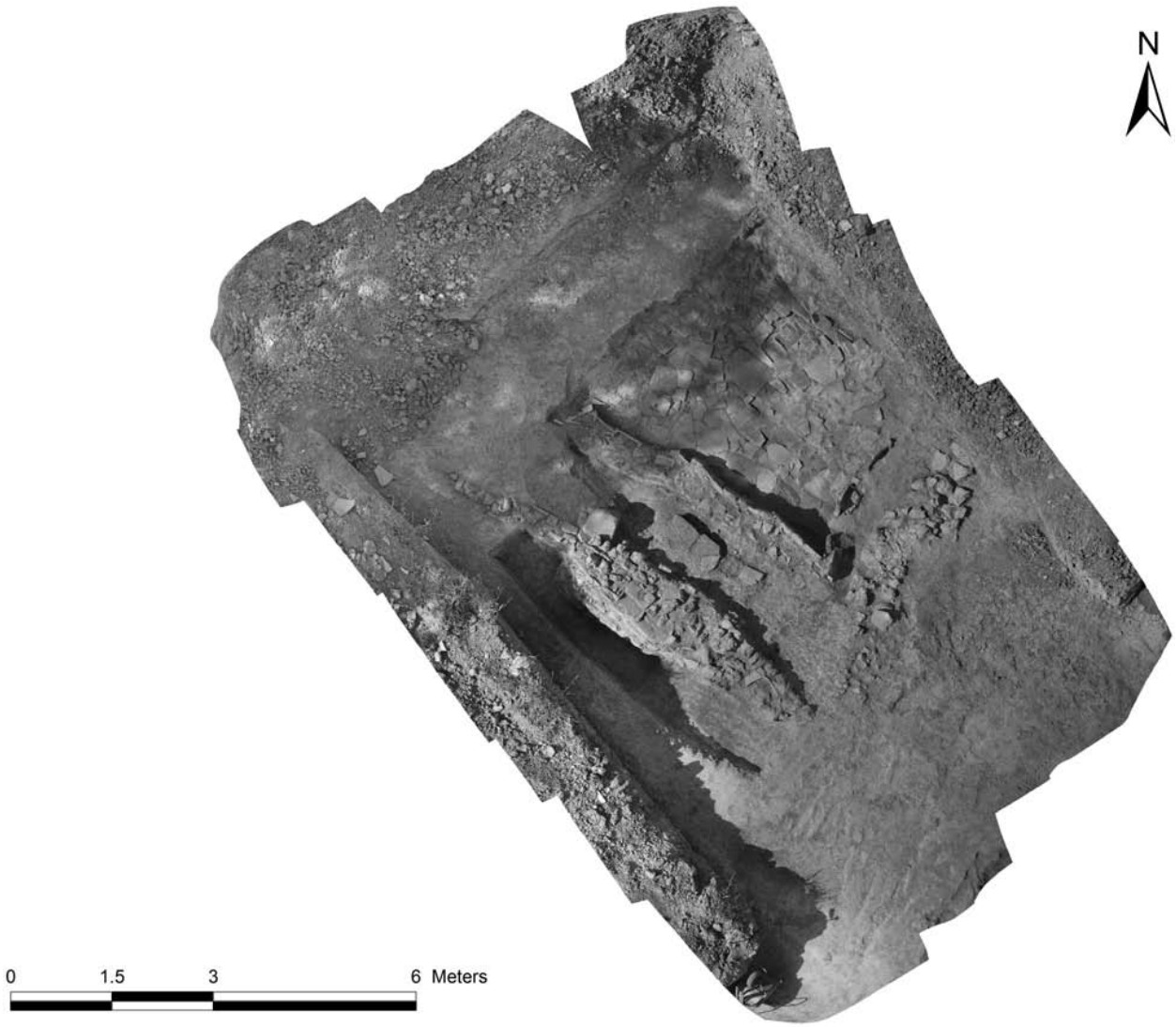


Fig. 11.16 Tombarelle, Area III, aerial photoscan model, paved area (MS).

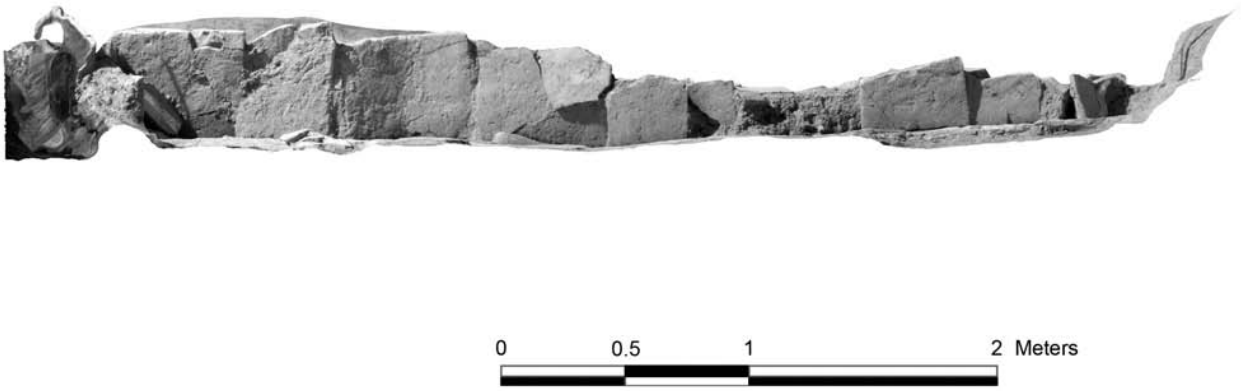


Fig. 11.17 Tombarelle, Area III, S elevation photoscan model, wall SU 17021/17010 (ERZ/MS).

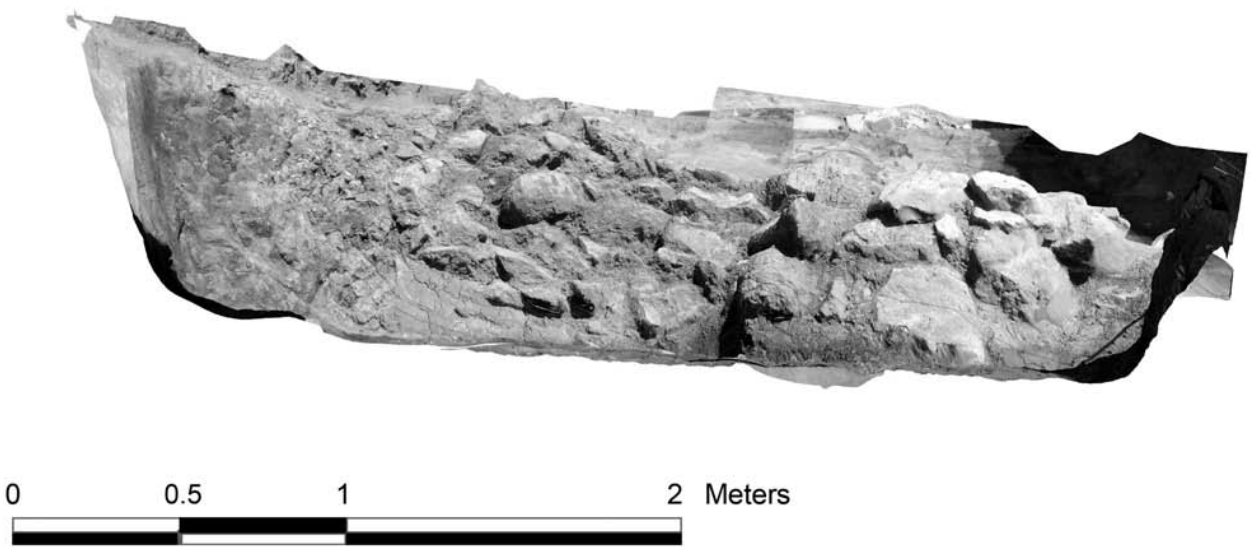


Fig. 11.18 Tombarelle, Area III, W elevation photoscan model, wall SU 17012 (ERZ/MS).

refuse disposal, but no definitive evidence in favor of any of these hypothesis was found. Geological evidence from the hillside itself (see below), may favor the former possibility.

Overall, the evidence connecting the pit and the paved unroofed structure to ceramic production is the strongest, a hypothesis reinforced by the significant amount of Color-coated ware (well over the quantities documented at other late Roman sites in the area), the presence of both overfired and deformed specimens, and two kiln spacers (see Ceramics, below). The pit is likely a site of clay extraction whereas the paved structure could have well been a drying facility where pots after being manufactured were left to dry to be later painted and fired in kilns (for the drying process of Roman pottery in general see Peacock [1982:66–67]).

Phase 3.2: Abandonment of the built features

Both the paved area and pit SU 17005 were covered by seemingly contemporary, but stratigraphically distinct dumps.

Over the paved area was a thick dump level (SU 17003), consisting of dark grey organic clay containing occasional angular and sub-angular stones, cobbles, light red orange rectangular bricks, a small amount of a pinkish white mortar, and seashells. It contained abundant roof tiles fragments and late antique pottery, both displaying a generally large fragment size (see Fig. 11.15 and below). The amount of pottery, bone, and charcoal was more abundant at the bottom of the deposit where it overlaid the tiled surface (SU 17011). The dump spread (SU 17003) was overlying two rubble collapse/rubble spreads (SU 17008, 17022), which was evidence of collapse and then abandonment of the area.

In the pit, fill SU 17002 represented the majority of cut SU 17005, indicating that the pit had been backfilled in one event. It, too, consisted of dark grey clay containing angular and sub-angular stones, some of which were unusually very large (largest measured 1.2 x 0.8 x 0.75 m), as well as red-orange rectangular bricks (0.13 x 0.08 x 0.05 m), and fragments of pink-white mortar. The deposit contained a large assemblage of late antique Roman ceramics, as well as smaller quantities of faunal material and some very large Roman *tegulae*. Again, tiles, stone, and bone displayed large fragment sizes, suggesting that large objects were deliberately selected for rapid backfilling. Beneath this principal dump lay a similar deposit (SU 17019) but composed principally of large *tegulae* and rectangular bricks laid at the sides of the cut and sloping down to the pit base (Fig. 11.20). These very large tiles (0.67 x 0.49 x 0.05 m) were mixed with an organic, dark grey soil similar to (SU 17002) with inclusions of a large amount of late antique Roman pottery, smaller fragments of roof tiles, bricks, inclusions of charcoal, and rare amounts of bone.

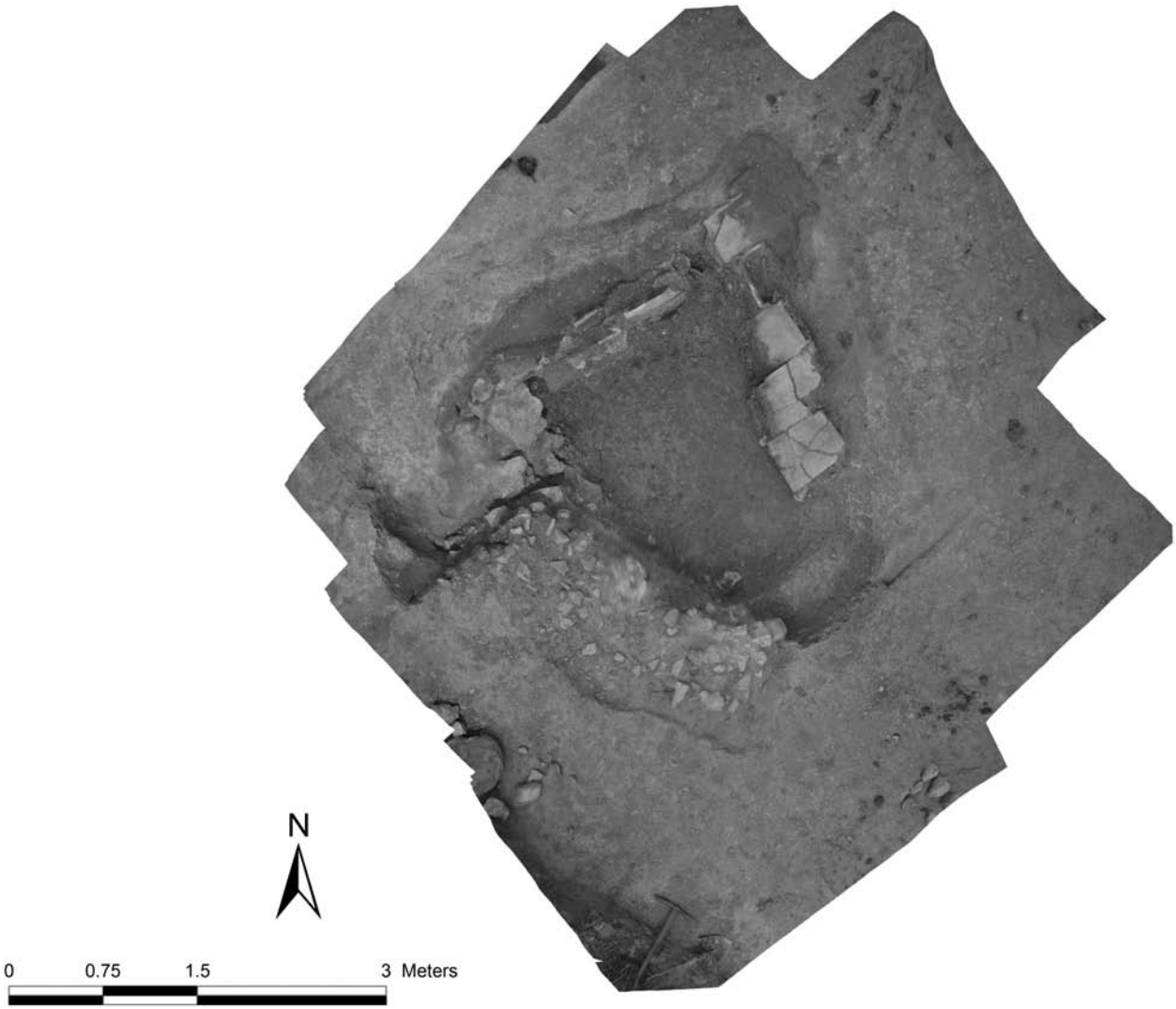


Fig. 11.19 Tombarelle, Area III, aerial photoscan model view of pit SU 17005 in course of excavation (ERZ/MS).

The two dumps/fills 17003 and 17002 were very similar in their soil morphology, artifact content, and chronology. Both were composed of large objects—either building material, large faunal pieces, some even with mortar adhering to them, or large ceramic fragments—pointing to a single, deliberate fill moment for both pit 17005 and the paved area. The lack of gnawing and good preservation of the bones provides further indication of the speed and deliberate nature of the fill, which was not subsequently disturbed by carnivores. Indeed, given the history of slumping at the site, the backfill may have been carried out to avoid further hill slumping in the area.

Both fills also contained coherent assemblages of late Roman ceramics with no residual materials. The only exception to this were two objects from SU 17002: a *tegula* stamped with an Etruscan inscription seemingly of 2nd–1st c. BC date, and a ceramic mold of a human face of uncertain date, both described fully below.

11.3.4 Area IV: Phase 2

Area IV lay towards the base of the hill on which the Tombarelle site was scattered. A 22 x 4 m trench was opened to explore the bottom of TU 241 and 242,

Fig. 11.20 Tombarelle, Area III, view of fills SU 17002 and 17019.

the latter of which yielded Roman-period ceramics (see Fig. 11.2 and Fig. 11.21).

Removal of the topsoil revealed a concentration of materials and reddish soil in the E end of the trench. Three slot trenches (TR 1–3) were placed at intervals across the whole trench, while the whole of the SE corner was subject to superficial excavation.

Only one clearly man-made feature—a pit (SU 18004) in the SE corner—was revealed by these sondages. The other slot trenches revealed an overlapping, seemingly consecutive series of slumps, running parallel to the hill slope, many of which contained sparse amounts of archaeological material (Figs. 11.22–11.24). SU 18002 in Slot Trench 1 was unusual in that it contained a high concentration of tiles and tile wasters as well as a possible kiln spacer, perhaps the downslope remains of a dump located outside the trench to the S in the area between Area III and IV.

Area IV seems to have seen very little human activity but was the recipient of earth and debris movement from upslope occupations. That some of those activities included tile and ceramic manufacturing is suggested by the wasters.

11.4 Chronology (EV)

The chronological indicators for each of the four Areas were distinct and non-overlapping, with the possible exception of the generally dated Roman cistern. It appears that, at least in the areas excavated, occupation moved around the hillside via a series of

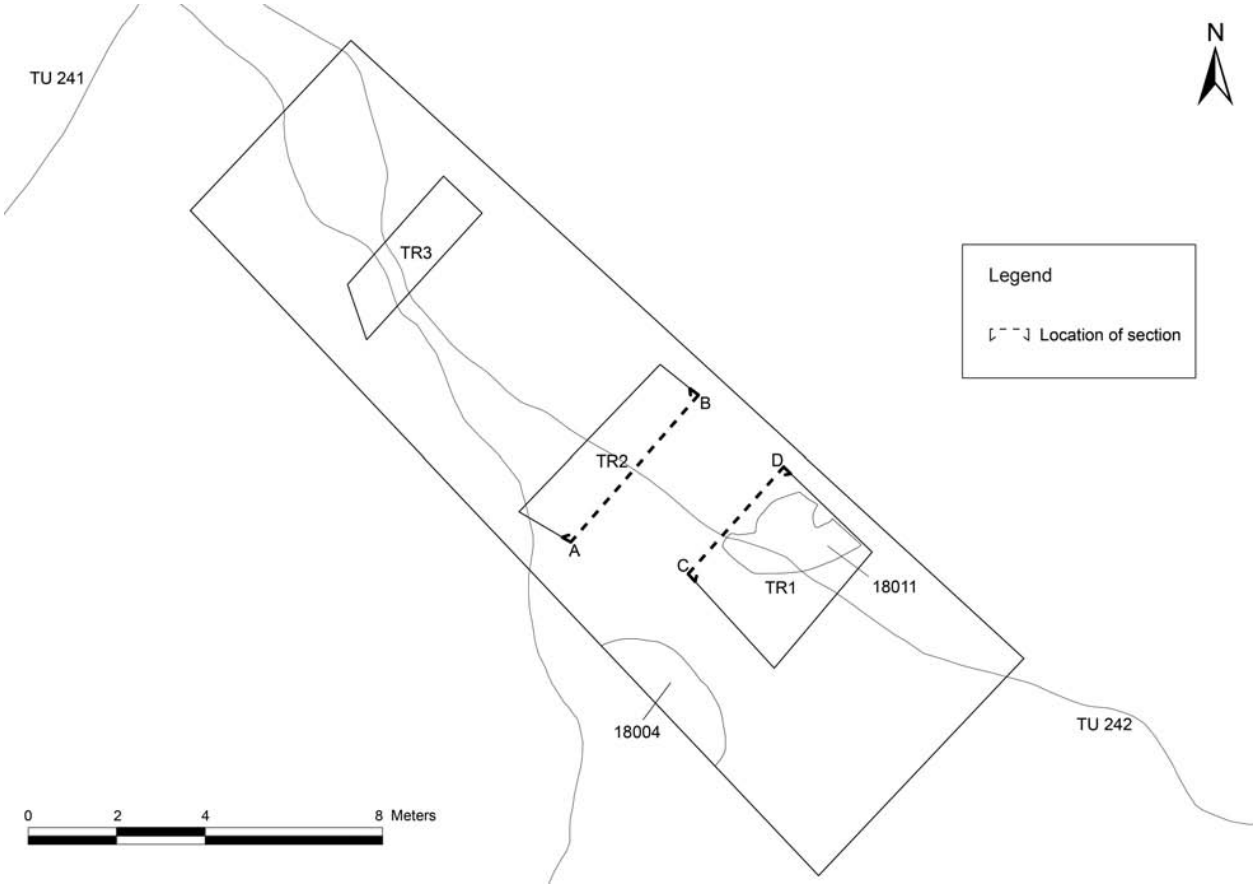


Fig. 11.21 Tombarelle, Area IV, plan (ERZ/MS).

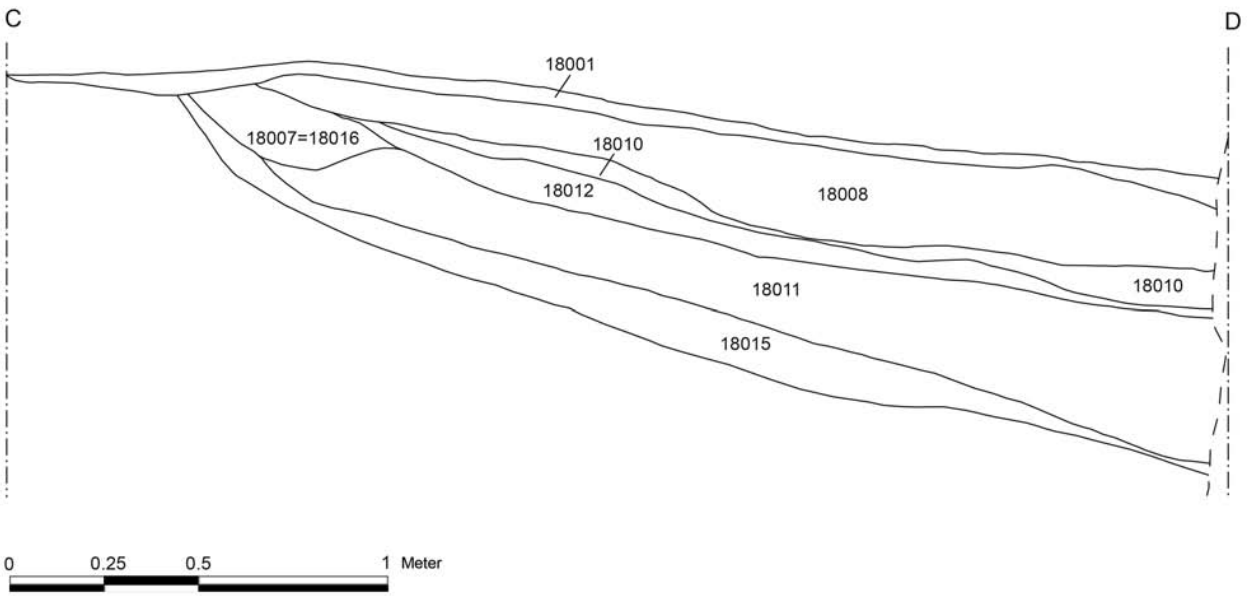


Fig. 11.22 Tombarelle, Area IV, W section, Trench 1 (ERZ/MS).

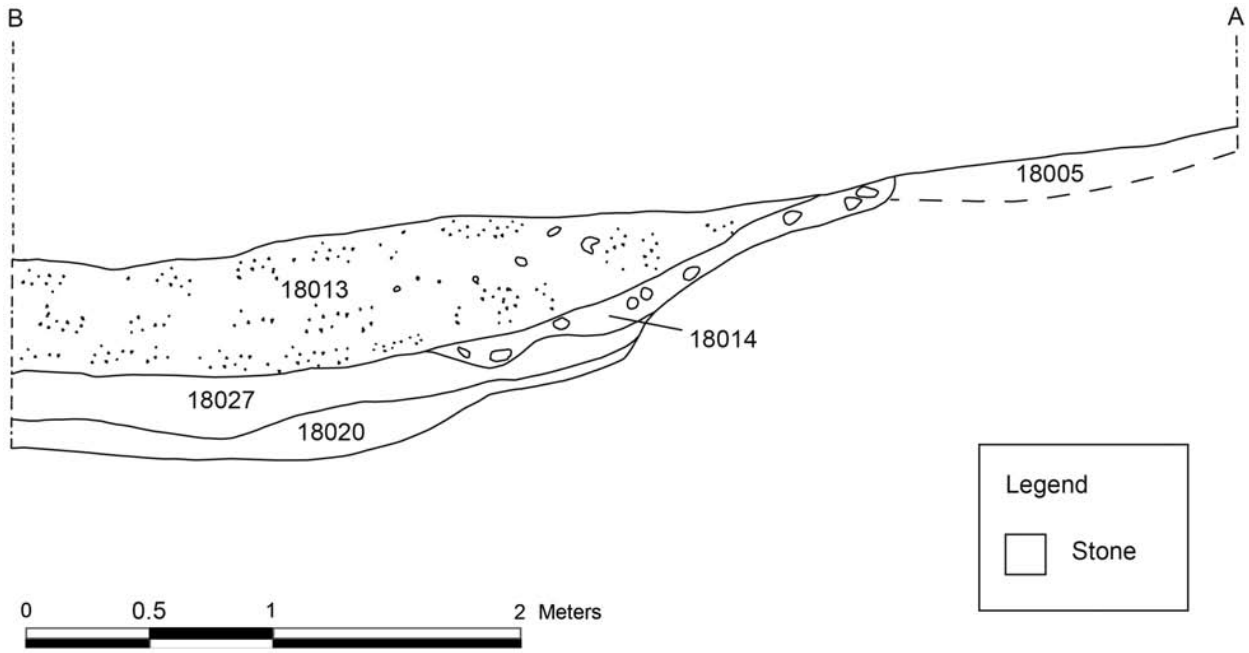


Fig. 11.23 Tombarelle, Area IV, E Section, Trench 2 (ERZ/MS).

Fig. 11.24 Tombarelle, Area IV, view of Trench 2 from S.

micro-topographic shifts with former areas abandoned when activity moved to a new area.

Phase 1? (Table 11.1): Area I, the cistern, could not be dated with certainty. The presence of an *opus signinum* lining points to a Roman date, but only a very few general Roman ceramics were found in Trench 1 (most of the Roman materials being *imbrices* and *tegulae*). We are assuming the cistern was in existence when Area II was formed (see below) and have tentatively assigned it to this phase. A thick abandonment level from Trench 2 inside the cistern produced a consistent collection of late 10th through11th/12th c. AD ceramics including three classes of *acroma depurata*, painted ware and kitchen ware.

Phase 1 (Table 11.2): Nearby Area II yielded the earliest deposits found on the site. The large number of joins between contexts SU 19007 (higher in the stratigraphy) and SU 19011 and 19015 (both lower in the stratigraphy than SU 19007), and the overall very similar profile suggests that SU 19007 represents the last episode of an accumulation/dumping event begun with SU 19011 and 19015.

The fills in the large cut incorporated materials referable to the latest phase of production of Black glazed ware (ca. 40 BC), when the repertoire was progressively reduced and a number of forms such as the patera Morel Species 2250/2280 (Fig. 11.25.1–7) anticipated the morphology of the early Italic sigillata. Most of the coarse ware and kitchen ware in SU 19007, 19011, and 19015 can well be dated to the 1st c. BC, but the ratio between Italic sigillata and Experimental sigillata on the one hand and late Black glazed ware permits a more precise dating. In SU 19011, Italic sigillata and Experimental sigillata are absent and fine wares are only represented by late Black glazed ware, whereas in SU 19007, although late Black glazed ware is still more abundant (9 MNI), Italic sigillata (2 MNI), and Experimental sigillata (2 MNI) (Fig. 11.26.1–2), the latter including materials from the early phase of production at Marzuolo dated 30/10 BC, make their appearance (see Vaccaro, Capelli, and Ghisleni 2017 and Ch. 10 above). This suggests that the deposits started being accumulated around 40 BC but the process only came to an end and was sealed in the early/mid-Augustan period, suggesting an accumulation event that took place over the period 40/30 to 10 BC.

Phase 2 (Table 11.3): Area IV produced less chronological material and as noted above, was composed largely of deposits washed downslope from areas above. The total absence of Black glazed ware and the dates of the Italic sigillata indicate a mid to late Augustan through Tiberian date. Sigillata forms include cups with externally grooved rims and rouletted walls identifiable with Conspectus 38 (see Fig. 11.33.1), datable between the Augustan and early Tiberian period, a fragment of a possible Conspectus 1 of early to mid-Augustan date, a fragment generically referable to Conspectus 4 (see Fig. 11.33.3) of Augustan through Tiberian/Claudian date, a fragment of Conspectus 20 (see Fig. 11.33.4), dated again from the

Table 11.1 Tombarelle, Area I, Phase 1 and 4 major excavated contexts with diagnostic ceramics/dates (EV).

Context	Chronological Information: Pottery	Total MNI	Possible date	Reliability
Phase 1? (Cistern)				
16004	No diagnostic potsherd was documented, only some fragmented tiles of a generic Roman date	N/A	Roman	Poor: only generic Roman material, low MNI
Phase 4				
16001	*Acroma depurata* ware: jugs sometimes with coplanar strap handle attested (5 MNI), basin with rectangular rim and wavy line on it (1 MNI); Red painted ware: generic closed form (1 MNI); Kitchen ware: *testo* (1 MNI), cooking pot with slightly hooked rim (1 MNI)	9	late 10th–12th c. AD	Medium: high MNI, but some contamination with plow soil (1 MNI of Modern glazed ware)
16021	*Acroma depurata* ware: small storage/transport amphora with strap handle (1 MNI); Kitchen ware: *testo* (1 MNI); cooking pot with everted squared rim (1 MNI)	3	late 10th–12th c. AD	Medium: no residuals, small but homogeneous context

Table 11.2 Tombarelle, Phase 1, Area II, major excavated contexts with diagnostic ceramics/dates. (EV).

Context	Chronological Information: Pottery	Total MNI	Possible date	Reliability
Phase 1				
19015	BGW: cup Morel 1222/1224 (1 MNI); Amphorae: Dressel 1 from the Ager Cosanus	6	40–30 BC	Medium: Leveling layer: smaller MNI
19012	Thin walls: beaker (1 MNI)	1	40–30 BC	Poor: possible wall collapse; low MNI
19013	Thin walls: beaker (1 MNI)	1	40–30 BC	Poor: accumulation layer: poor
19011	BGW: dish Morel 2250/2280 (2 MNI); Amphorae: small amphora with triangular rim of local production (Marzuolo?) (1 MNI)	13	40–30 BC	Good: Large sealed dump
19006	BGW: dish Morel 2250/2280 (1 MNI)	8	Possibly 40–30 BC to early to mid-Augustan	Good
19004	Only one large drain fragment is attested	1	possible Augustan	Poor: Possible fire moment; modern disturbance
19003	BGW: bowl Morel 2640/2650 (1 MNI); Italic sigillata: dish Conspectus 1 (1 MNI); early version of platter Conspectus 22? (1 MNI)	4	Augustan (disturbed)	Poor: Possible dumping event; modern disturbance indicated by shotgun shells
19007	BGW: dish Morel 2250/2280 (4 MNI), dish 1430/1440 *similis* (1 MNI), bowl Morel 2640/2650 (1 MNI), base with radial stamps (rosette) (1 MNI), base with opposed 'peltas' (1 MNI); Experimental sigillata: dish Conspectus 8 *similis* (1 MNI), dish Conspectus 1 *similis* (1 MNI); Italic sigillata: small chalice or handled cup (1 MNI); Amphorae: Baetican Dressel 9 (1 MNI); local-regional amphorae (2 MNI).	56	Augustan	Good: Large sealed dump
19002	BGW: bowl Morel 2640/2650 (1 MNI); Experimental sigillata: dish Conspectus 8 *similis* (1 MNI).	11	Augustan (disturbed)	Poor: Interface layer between topsoil and lower stratigraphy with modern disturbance
19001	BGW: dish Morel 2250/2280; Italic sigillata: dish Conspectus 3, early version (1 MNI); Amphorae: Van der Werff 2 (1 MNI)	8	Augustan	Poor: Interface with topsoil; disturbed

Augustan to the Tiberian and Claudian periods and, finally one sherd of Conspectus 18 (see Fig. 11.33.5), produced in the Augustan and Tiberian ages.

Phase 3 (Table 11.4): Area III on the mid-slope with its enigmatic paved area and pit produced only late antique materials, with a possible difference between the construction of the paved area, and the subsequent fill of this and the adjacent pit.

The make-up levels for paved area and surrounding walls (SU 170024 and 17027) yielded only 2 MNI. A Color-coated ware base fragment of a bowl from SU 17027 can only be generically assigned to a mid- or late Roman date. Seven sherds of a carinated bowl with rounded rim and non-sintered reddish coating were not paralleled in the late Roman backfilling/abandonment deposits above the floor. This form, more than others at late Roman Tombarelle, seems to derive from mid-Roman African red slip ware types, such as the carinated bowl Hayes 16, dated to the late 2nd or early 3rd c. AD. One more comparison can be

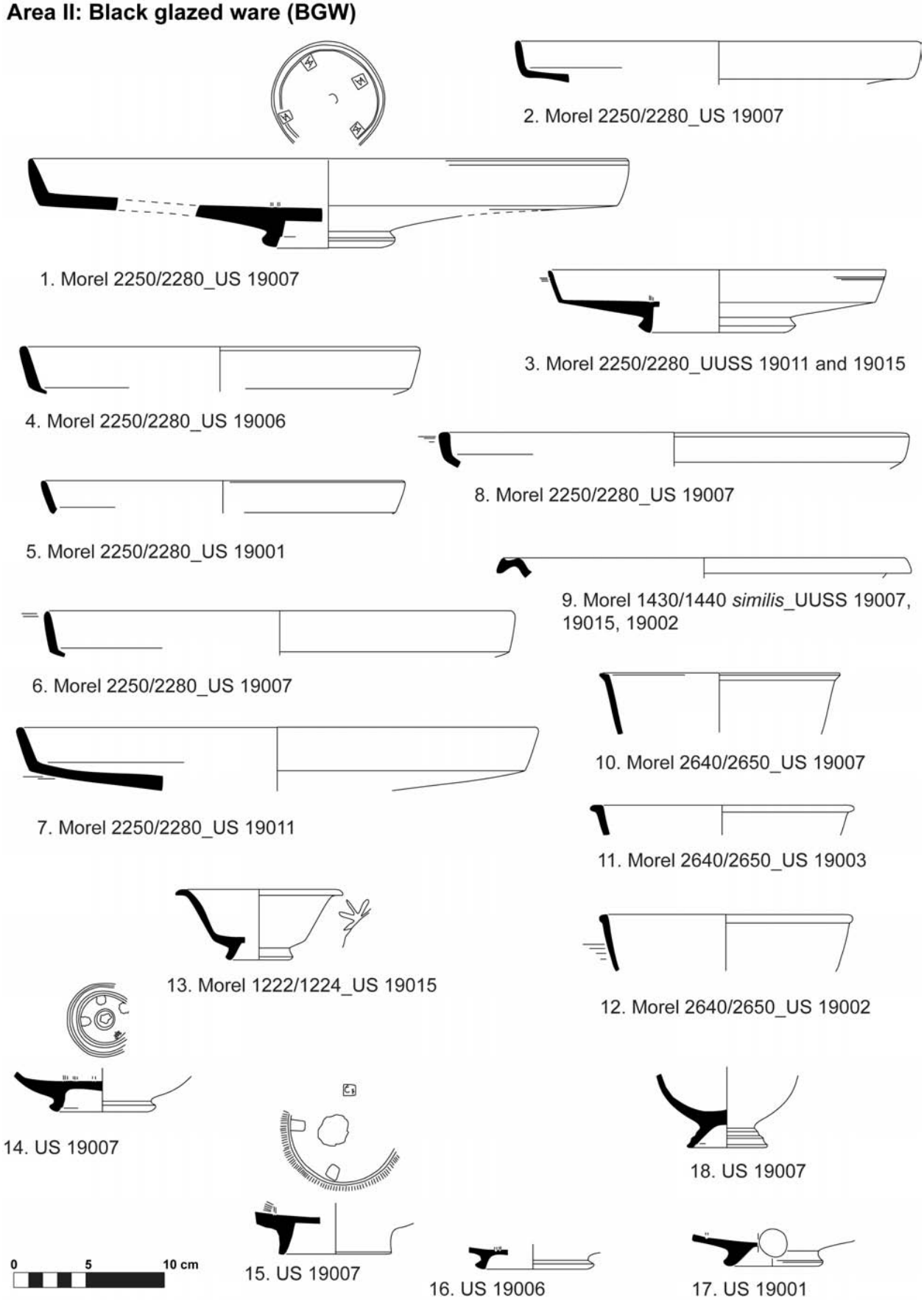


Fig. 11.25 Tombarelle, Area II, Phase 1, Black glazed ware (BGW): 1–8. Morel 2250/2280 dishes; 9. Morel 1430/1440 *similis* dish; 10–12. Morel 2640/2650 bowls; 13. Morel 1222/1224 cup; 14. Unidentified bowl; 15–17. Unidentified dishes or bowls; 18. Unidentified cup (?) (EV).

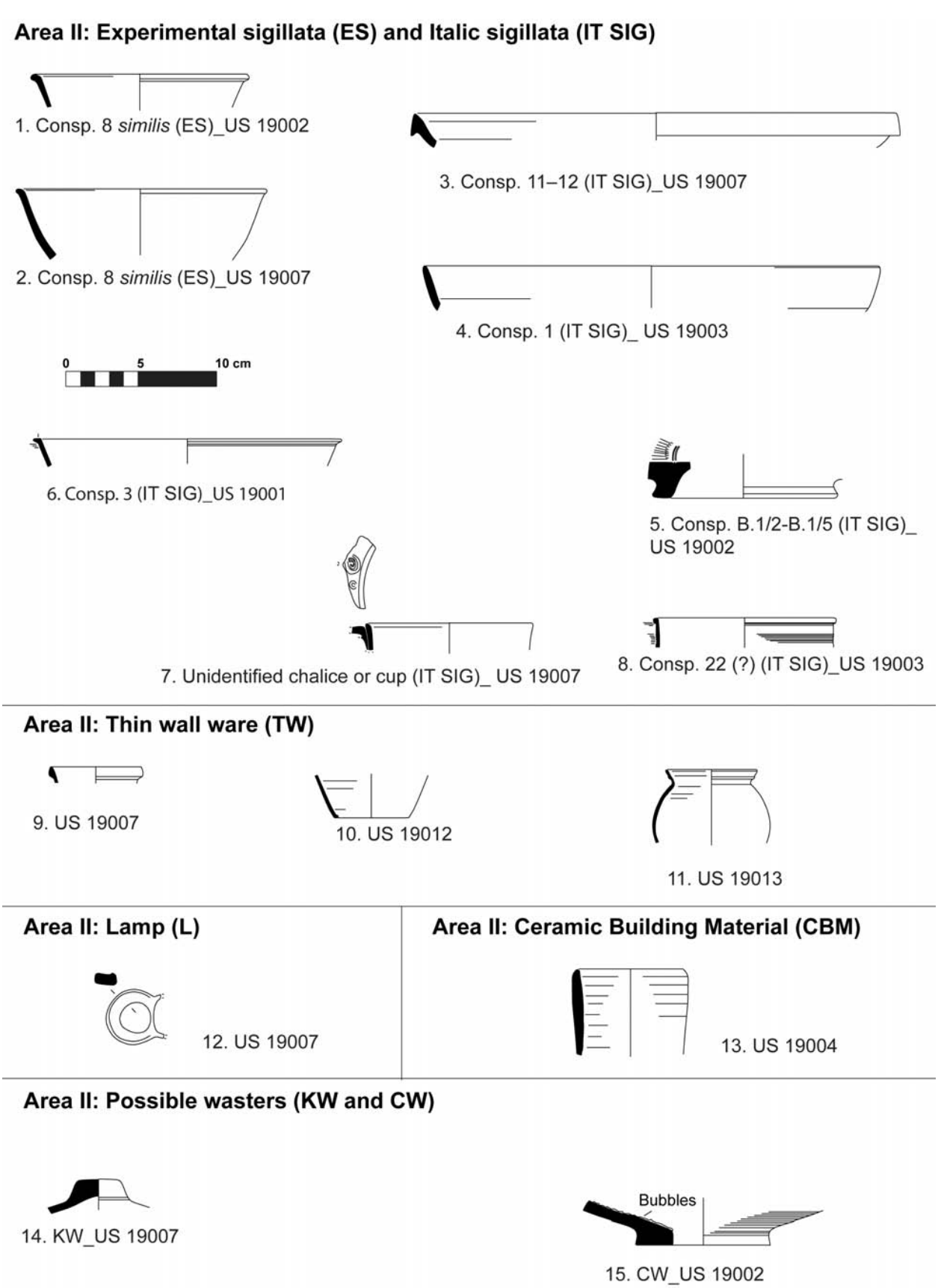


Fig. 11.26 Tombarelle, Area II, Phase 1, Experimental sigillata (ES), Italic sigillata (IT SIG), Thin wall ware (TW), lamp (L), ceramic building materials (CBM) and possible wasters: 1–2. Conspectus 8 *similis* bowls (ES); 3. Conspectus 11–12 dish (IT SIG); 4. Conspectus 1 dish (IT SIG); 5. Conspectus B.1/2-B.1/5 dish (IT SIG); 6. Conspectus 3 dish (IT SIG); 7. Unidentified chalice or cup (IT SIG); 8. Conspectus 22 cup (?) (IT SIG); 9–11. Beakers (TW); 12. Unidentified central-Italic lamp (L); 13. Drain (CBM); 14. Possible lid waster (KW); 15. Possible jug waster (CW) (EV).

Table 11.3 Tombarelle Phase 2, Area IV major excavated contexts with diagnostic ceramics/dates (EV).

Context	Chronological Information: Pottery	Total MNI	Possible date	Reliability
Phase 2				
18011	Coarse ware: Flat base of a jar (1 MNI)	1	Generic Roman	Poor: due to the absence of fine ware and amphorae
18014	Italic sigillata: Dish Conspectus 1 (1 MNI)	2	Augustan to Tiberian	Medium/poor: low MNI
18013	Lamp: Vogelkopflampe Dressel 4 (1 MNI)	2	Augustan to Tiberian	Good: small MNI but quite reliable on the basis of the lamp evidence
18003	Coarse ware: jug with flattened rim of generic early imperial date (1 MNI)	1	Generic early imperial	Poor: low MNI
18008	Kitchen ware: flat base of cooking pot (1 MNI)	1	Generic Roman	Poor: low MNI
18009	Italic sigillata: Dish Conspectus 4 (1 MNI), dish Conspectus 20 (1 MNI), platter Conspectus 18.2 (1 MNI)	11	Augustan to Tiberian	Medium
18007	Coarse ware: jug with flat base of generic early imperial date	1	Generic early imperial	Poor: low MNI
18002	Amphorae: Dressel 2/4 from the Ager Cosanus (1 MNI)	5	Augustan to Tiberian	Medium
18001	Italic sigillata: Cup Conspectus 38 (1 MNI)	5	Augustan to Tiberian	Medium

Table 11.4 Tombarelle, Phase 3, Area III, major excavated contexts with diagnostic ceramics/dates (EV).

Context	Chronological Information: Pottery	Total MNI	Possible date	Reliability
Phase 3				
17024	Color-coated ware: carinated bowl comparable with specimens from 17002 and 17003 (1 MNI)	1	Generic 5th c. AD	Poor: make-up level for pavement 17011: sealed, but low MNI
17002	Color-coated ware: dishes imitating ARS Hayes 61A/B or 61B (6 MNI), dishes imitating ARS Hayes 62 (2 MNI), dish imitating ARS Hayes 62/64 (1 MNI with joins with 17008)	81	5th c. AD (likely 400–475)	Good: Joins: 2 MNI with 17008; 4 MNI with 17019
17003	Color-coated ware: dishes imitating ARS Hayes 61A/B or 61B (8 MNI, plus 1 MNI that has joins with 17008), bowl derived from ARS Hayes 70 (1 MNI), dishes imitating ARS Hayes 62 (2 MNI), dish imitating ARS Hayes 62/64 (1 MNI with joins with 17008); Mediterranean amphorae: LR1 (1 MNI)	95	5th c. AD (likely 400–475)	Good: Joins: 1 MNI with 17011; 8 MNI with 17008
17019	Color-coated ware: dish imitating ARS Hayes 62 (1 MNI).	4	5th c. AD (likely 400–475)	Good
17008	Color-coated ware: dishes imitating ARS Hayes 61A/B or 61B (1 MNI, plus 1 MNI that has joins with 17008 and is only counted for 17003); SCT: dish imitating ARS Hayes 62 (1 MNI), bowl imitating the late version of ARS Hayes 14 (1 MNI)	8	5th c. AD (likely 400–475)	Good

found at Case Nuove with a Color-coated ware bowl attested in the cistern dump of the first half of the 3rd c. AD (see Ch. 5). However, it should also be noted that carinated bowls of similar shape are also documented at Roselle in contexts dated to the 4th to the very early 5th AD (Vaccaro 2011, pl. V, n.3.) Thus, a general 3rd–4th to early 5th c. AD date for this specimen is appropriate.

Joins between ceramic fragments from the two abandonment dumps (SU 17002 and 17003) as well as the rubble abandonment point to a short, somewhat later backfill moment. The backfilling/destruction deposits (SU 17002, 17019, 17003, and 17008) all suggest a 5th c. AD date. The absence of imports (apart from a single 5th c. AD LR1 amphora) and particularly African red slip wares precludes refining the date. However, there are some elements in the Color-coated ware which may provide some suggestions. The imitations of flat-based dishes Hayes 61 in Color-coated ware (e.g., Fig. 11.35.3–4) are all inspired by the early variants Hayes 61A/B and B rather than by the later ones (Hayes 61 C). None of these imitations has similarities with the late 5th c. AD prototypes Hayes 61C. The chronology of the Hayes 61 variants imitated in the ceramic repertoire at Tombarelle falls in the early to mid 5th c. AD. At the same time, the stamped motifs found associated with some Color-coated ware (e.g., Fig. 11.35.1–4) derive from African red slip prototypes assignable to the period 350–470 AD, without any later evidence. Even more interesting is the complete absence of flanged-bowls imitating the prototype Hayes 91, which, are common in Roselle in the 6th to early 7th c. and now at nearby Santa Marta from the later 5th c. onwards. All this suggests that the 5th c. backfilling and destruction events in Area III took place before the last quarter of the 5th c. We consider a date between the early and third quarter of the 5th c. the most plausible.

Phase 4 (see Table 11.1 above): Ceramics from SU 16001 and 16021 point to a date sometime between the late 10th and 11th/early 12th c. AD with parallels at other contemporary sites in the sub-region (Vaccaro 2011:203–228 and forthcoming[b]). These included *acroma depurata* jugs with strapped handles, a small regional amphora (Vaccaro 2015), Red painted wares (mostly attested in the area between Ager Cosanus and Colline Metallifere between the 10th and 11th c. AD) and cooking pots with medium-everted rim and slightly pointed lip typical of the later 10th through early 12th c.

11.5 Ceramics (EV)

Tombarelle produced the second highest quantity (by sherd count) of ceramics in the project (Tables 11.5–11.6), after Marzuolo, the ceramic production center. This is due to the large quantity of sherds from the dumps in Area III/Phase 3 but, as will be discussed below, may also be a result of the site having served, in at least two of its phases, as a ceramic production center in its own right.

The below discussion is organized by phase, rather than Area, so that temporal and functional changes may be more readily assessed (see also Vaccaro et al. 2019 and Vaccaro 2019).

11.5.1 Phase 1 (Area II)

This Area yielded 109 MNI, the second-most ceramic rich area of the site (Figs. 11.25–11.32). Wares generally date to the late 1st c. BC.

An overview of ceramic classes, as illustrated in Table 11.5, shows both a marked predominance and variety of fine wares (late Black glazed ware, Experimental sigillata and Italic sigillata) corresponding to some 24.76%. This value is comparable to the fine ware counts from other project sites. The most documented fine ware class is Black glazed ware 16.51% (Fig. 11.25). The fabrics and possible areas of provenance all seem to refer to workshops located in central or northern Etruria, with Arezzo being a good candidate. At least four different slips were identified of varying qualities, attesting to, at a minimum, differences in craftsmanship if not different levels of technological proficiency. The most common form is the dish/patera Morel 2250/2280, documented with a total of 8 MNI (Fig. 11.25.1–8). This form is typical of the last phase of Black glazed production of Arezzo up to the mid 1st BC (Nicoletta 2011:85–88) and was produced until the transition to Italic sigillata. It is not a coincidence that this form represents a prototype of one of the earliest forms of Italic sigillata, the dish Conspectus 1.

Experimental sigillata and Italic sigillata are documented respectively with 3 and 6 MNI in Area II (Fig.

Table 11.5 Tombarelle, ceramic classes, Phases 1–3, by MNI and %MNI of diagnostics (EV).

Ware	Tombarelle Phase 1 (257 diagnostics/109 MNI)	Tombarelle Phase 2 (34 diagnostics/29 MNI)	Tombarelle Phase 3 (367 diagnostics/190 MNI)
BGW	18 or 16.51%	0 or 0%	0 or 0%
Italic sigillata	6 or 5.5%	6 or 20.68%	0 or 0%
Thin walls	3 or 2.75%	1 or 3.44%	0 or 0%
Experimental sigillata	3 or 2.75%	0 or 0%	0 or 0%
ARS	0 or 0%	0 or 0%	0 or 0%
Color-coated ware	0 or 0%	0 or 0%	121 or 63.68%
SCT	0 or 0%	0 or 0%	2 or 1.05%
Late Italic sigillata	0 or 0%	0 or 0%	0 or 0%
Coarse ware	45 or 41.28%	11 or 37.93%	10 or 11.05%
Kitchen ware	23 or 21.1%	5 or 17.24%	41 or 21.57%
Tunisian kitchen ware	0 or 0%	0 or 0%	0 or 0%
Amphorae	6 or 5.5%	2 or 6.89%	2 or 1.05%
Coarse ware/amphorae	0 or 0%	0 or 0%	0 or 0%
VRI	4 or 3.66%	3 or 10.34%	0 or 0%
Dolia	0 or 0%	0 or 0%	1 or 0.52%
Lamps	1 or 0.91%	1 or 3.44%	0 or 0%
Loomweights	0 or 0%	0 or 0%	0 or 0%
Amphora stopper	0 or 0%	0 or 0%	0 or 0%
Other ware (*tubuli*? and kiln spacers)	0 or 0%	0 or 0%	0 or 0%
Thin walls/coarse ware	0 or 0%	0 or 0%	0 or 0%
Color-coated ware/coarse ware	0 or 0%	0 or 0%	2 or 1.05%

Table 11.6 Tombarelle, ceramic forms/functions, Phases 1–3, by MNI and % of MNI of diagnostics (EV).

FORMS	Tombarelle Phase 1 (257 diagnostics/109 MNI)	Tombarelle Phase 2 (34 diagnostics/29 MNI)	Tombarelle Phase 3 (367 diagnostics/190 MNI)
KITCHEN (includes KW and VRI)	**27 or 24.77%**	**8 or 27.5%**	**41 or 21.54%**
Generic closed forms for kitchen	0	0	0
Cooking pots	9 or 8.25%	3 or 10.34%	22 or 11.57%
Cooking jugs	0	0	0
Generic open forms for kitchen	0	0	0
Casseroles	0	1 or 3.44%	9 or 4.73%
Cooking bowls	0	1 or 3.44%	1 or 0.52%
Frying pans/*tegami*	5 or 4.58%	3 or 10.34%	0
Bread-baking pans/*testi*	0	0	0
Clibani	6 or 5.5%	0	3 or 1.57%
Cooking lids	7 or 6.42%	0	6 or 3.15%

Table 11.6 cont'd Tombarelle, ceramic forms/functions, Phases 1–3, by MNI and % of MNI of diagnostics (EV).

FORMS	Tombarelle Phase 1 (257 diagnostics/109 MNI)	Tombarelle Phase 2 (34 diagnostics/29 MNI)	Tombarelle Phase 3 (367 diagnostics/190 MNI)
DINING/STORING (includes CW, FW, and CCW)	**74 or 67.88%**	**18 or 62.06%**	**144 or 75.78%**
Generic closed forms for table and storage	0	0	6 or 3.15%
Jugs	23 or 21.1%	7 or 24.13%	16 or 8.42%
Jars	5 or 4.58%	1 or 3.44%	0
Jugs/jars	5 or 4.58%	0	15 or 7.89%
Beakers	3 or 2.75%	1 or 3.44%	1 or 0.52%
Small table pot	0	0	0
Bottles	3 or 2.75%	0	6 or 3.15%
Flasks	0	0	0
Chalice	0	0	0
Flanged-Bowls	2 or 1.83%	0	0
Generic opens forms for table	0	0	0
Bowls	14 or 12.84%	1 or 3.44%	18 or 9.47%
Cups	2 or 1.83%	2 or 6.89%	0
Dishes	16 or 14.67%	5 or 17.24%	42 or 22.10%
Bowls/Dishes	0	0	0
Basins	0	0	37 or 19.47%
Lids	0	0	2 or 1.05%
Small vessels for sauces or perfumes(?)	1 or 0.91%	1 or 3.44%	0
Uncertain (food processing?)	0	0	1 or 0.52%
Mortaria	0	0	0
TRANSPORT and STORAGE	**6 or 5.5%**	**2 or 6.89%**	**3 or 1.57%**
Amphora stoppers	0	0	0
Amphorae	6 or 5.5%	2 or 6.89%	2 or 1.05%
Dolia	0	0	1 or 0.52%
Table amph/jar	0	0	0
LIGHTING	**1 or 0.91%**	**1 or 3.44%**	**0**
Lamps	1 or 0.91%	1 or 3.44%	0
OTHER "FUNCTIONAL" CERAMICS	**1 or 0.91%**	**0**	**2 or 1.05%**
Loomweights	0	0	0
Drains	1 or 0.91%	0	0
Unguentaria	0	0	0
Kiln spacers	0	0	2 or 1.05%
Molds	0	0	0
Tubuli	0	0	0
RESIDUALS	**0**	**0**	**0**
UNCERTAIN	**0**	**0**	**0**

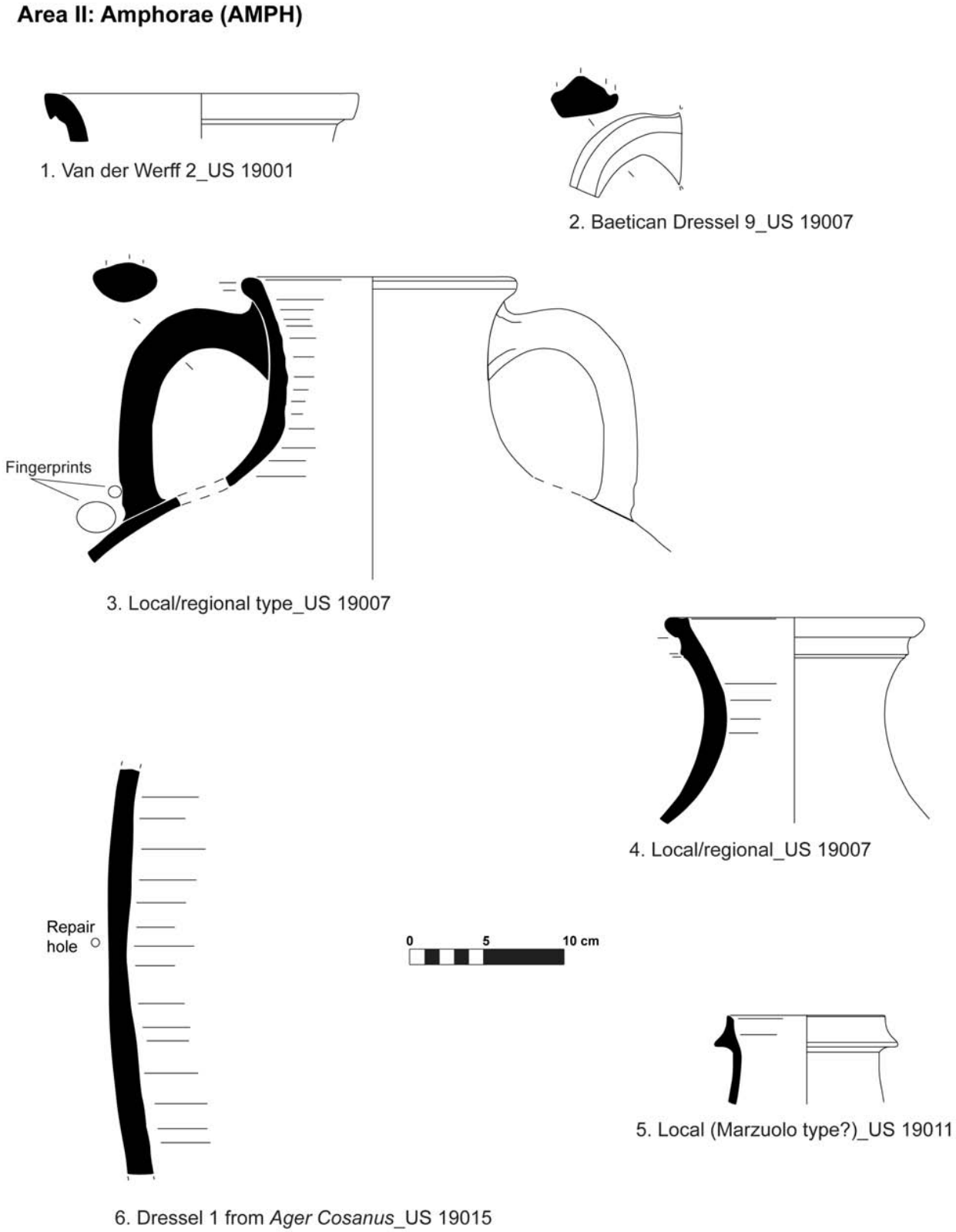


Fig. 11.27 Tombarelle, Area II, Phase 1, amphorae (AMPH): 1. Tunisian Van der Werff 2; 2. Baetican Dressel 9; 3–4. Local/regional types; 5. Local type (Podere Marzuolo product?); 6. *Ager Cosanus* Dressel 1 (EV).

11.26.1–8). The presence of Experimental sigillata in the large dump (SU 19007) is useful for determining the *terminus ante quem* of the series of dumps in the early or mid-Augustan period, at the same time as the first production of fine ware at Marzuolo (see Ch. 10). Also of interest is the presence of 2 MNI of both Conspectus 8 *similis* (Fig. 11.26.1–2) with a fabric referable to the Marzuolo production (see Vaccaro, Capelli, and Ghisleni 2017 and Ch. 10). One dish of a shape similar to the type Conspectus 1, on the other hand, does not seem immediately to be from Marzuolo. Other Italic sigillata dishes are types Conspectus 1 (Fig. 11.26.4) and a variant of Conspectus 3.1.2. The latter comes from the highest (in the stratigraphy) deposit SU 19001 and represents the latest Italic sigillata form documented here (its production, started in the 1st AD, continued until the early 2nd AD).

Apart from these two dominant fine ware classes, others are less common: Thin wall wares are documented by 3 MNI of beakers, while only one lamp is documented (Fig. 11.26.9–11).

Area II produced only 6 amphorae (or 5.5% of the all MNI) (Fig. 11.27). Four of them refer to local and regional sources, while two are imported. Particularly worth noting is the presence of the medium-sized, flat-based wine(?) amphora with triangular rims (Fig. 11.27.5), documented at early to mid-Augustan Marzuolo and possibly produced at that site. The only two overseas imports are one Tunisian or Tripolitanian Van der Werff 2 wine-amphora (Fig. 11.27.1), produced from the 2nd BC to the 1st AD, already documented at Case Nuove with a less everted rim (Vaccaro and MacKinnon 2014:234) and one Baetican fish-sauce Dressel 9 amphora (Fig. 11.27.2).

Kitchen wares in Area 1 are documented with some 27 MNI corresponding to 24.77% of the total, a significant number but consistent with the sites of the period (Fig. 11.28–11.29). Kitchen wares also included *clibani* (5.5%) for baking bread or cakes and *vernice rossa interna tegami*, large shallow bowls for roasting or frying.

Apart from the two imported amphorae and the impressive quality and formal variety of the fine wares, fabric analysis shows that the vast majority of the vessels—including Black glazed wares, Experimental and Italic sigillata, coarse wares, kitchen wares, and *vernice rossa*—all derive from local and/or regional sources. The only lamp documented seems to refer to a generic central Italic production, 2 MNI out of 3 thin wall wares may have been produced in Rome/Lazio, and only 2 MNI out of a total of 6 amphorae are overseas imports.

More emphatically indicating the local nature of ceramic sourcing are the several kiln wasters from the Area, indicating possible ceramic production on the site during the second half of the 1st c. BC (Fig. 11.26.14–15). These two specimens are a kitchen ware lid handle in an overfired fabric and one disk-shaped base of a possible jug, in a highly overfired gray fabric, characterized by many bubbles on the internal surface of the vessel.

Even more so than other sites of its period, Area II displays a large quantity of closed table and storage vessels for liquids. Some 38% of the assemblage is comprised of jugs, jars, bottles, and the more undetermined series of large jugs/table jars, as well as cups and beakers (Fig. 11.30–11.31). Jugs show considerable variations, with mouths ranging between 10 and 16 cm while the bases can be flat (e.g., Fig. 11.31.19), dish-shaped (Fig. 11.31.21), but more generally ring-footed (Fig. 11.31.17–18, 20). Only 1 MNI of trefoil-mouthed jug is documented (Fig. 11.31.1). One common type is characterized by sub-vertical undistinguished rim (Fig.11.31.2–3) with parallels at Pievina in the late 1st century BC (Ghisleni et al. 2011:115, fig. 31, n. 8). Another common type, with several variants, has a triangular, pointed rim (Fig. 11.31.10–16) with generic comparisons at Marzuolo in contexts of the early to mid-Augustan period. Only 3 MNI of bottles are documented, but again show considerable formal variety (Fig. 11.32.1–3). Table/storage jars are characterized by quite wide mouths (18–24 cm), thick walls and large flat bases and, based on rim profiles, included at least four main types (Fig. 11.30.1–3, 6–7, 9). Cups include the Black glazed small cup Morel 1222/1224 (Fig. 11.25.13), while beakers are all in thin walled ware (Fig. 11.26.9–11).

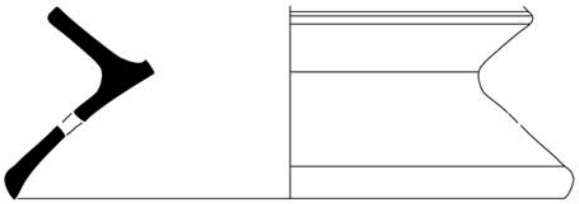
Next in significance are open vessels used for dining and the consumption of solid foods: dishes (14.67%), bowls (12.84%). and flanged bowls (1.83%). These are all in fine wares, the majority Black glazed ware. The most common are the dish/patera Morel 2250/2280, documented with a total of 8 MNI (see Fig. 11.25.1–8).

Cooking vessels used for boiling/stewing predominate over those for frying/roasting. Cooking pots (8.25%) include a type with medium-everted rim (see Fig. 11.29.1–2), one of which has an ovoid

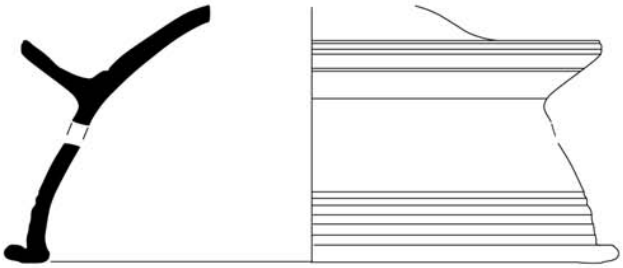
text continues on p. 394

Area II: Kitchen ware (KW) *clibani* and lids

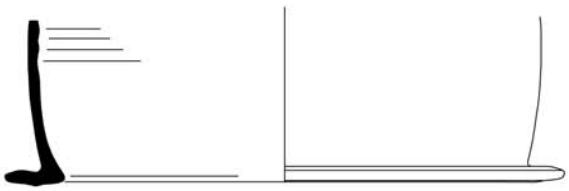
1. *Clibanus* (KW)_US 19002



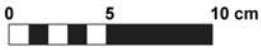
2. *Clibanus* (KW)_UUSS 19007 and 19011



3. *Clibanus* (KW)_UUSS 19007, 19011 and 19015

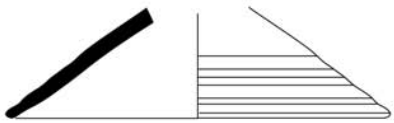


4. *Clibanus* (KW)_US 19015



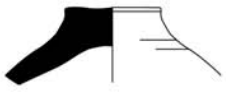
5. *Clibanus* (KW)_US 19002

6. Lid (KW)_US 19006



7. Lid (KW)_US 19007

8. Lid (KW)_US 19007



9. Lid (KW)_US 19007

10. Lid (KW)_US 19007

Fig. 11.28 Tombarelle, Area II, Phase 1, Kitchen wares (KW): 1–5. Clibani; 6–10. Lids. (EV).

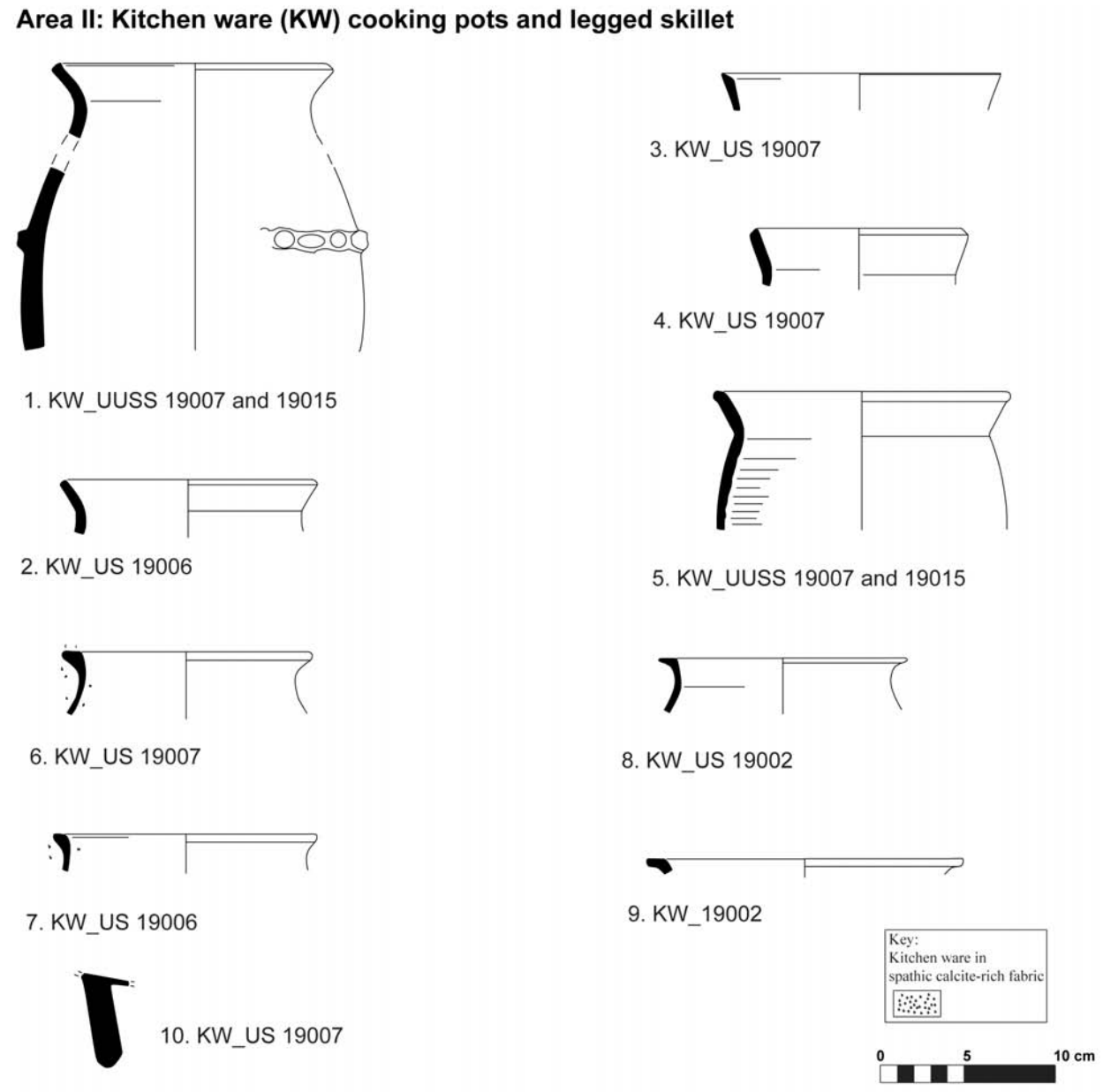


Fig. 11.29 Tombarelle, Area II, Phase 1, Kitchen wares (KW): cooking pots and legged skillets and *vernice rossa interna* (VRI). 1–9. Cooking pots (KW); 10. Legged skillet (KW); 11–14. *Tegami*/cooking pans (VRI) (EV).

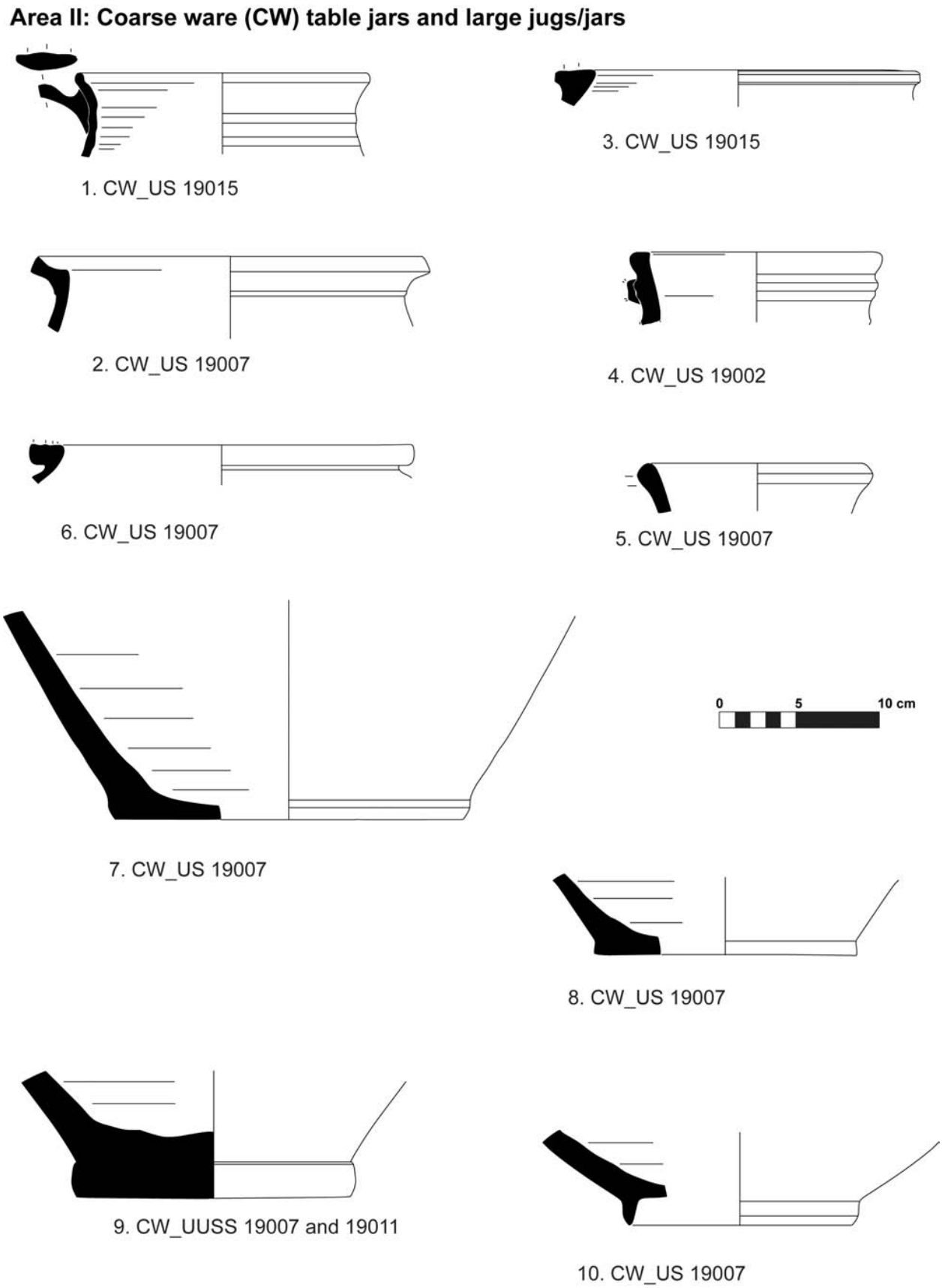


Fig. 11.30 Tombarelle, Area II, Phase 1, Coarse ware (CW) jars and jugs: 1–3, 6–7, 9. Table jars; 4–5, 8, 10. Large jugs/jars (EV).

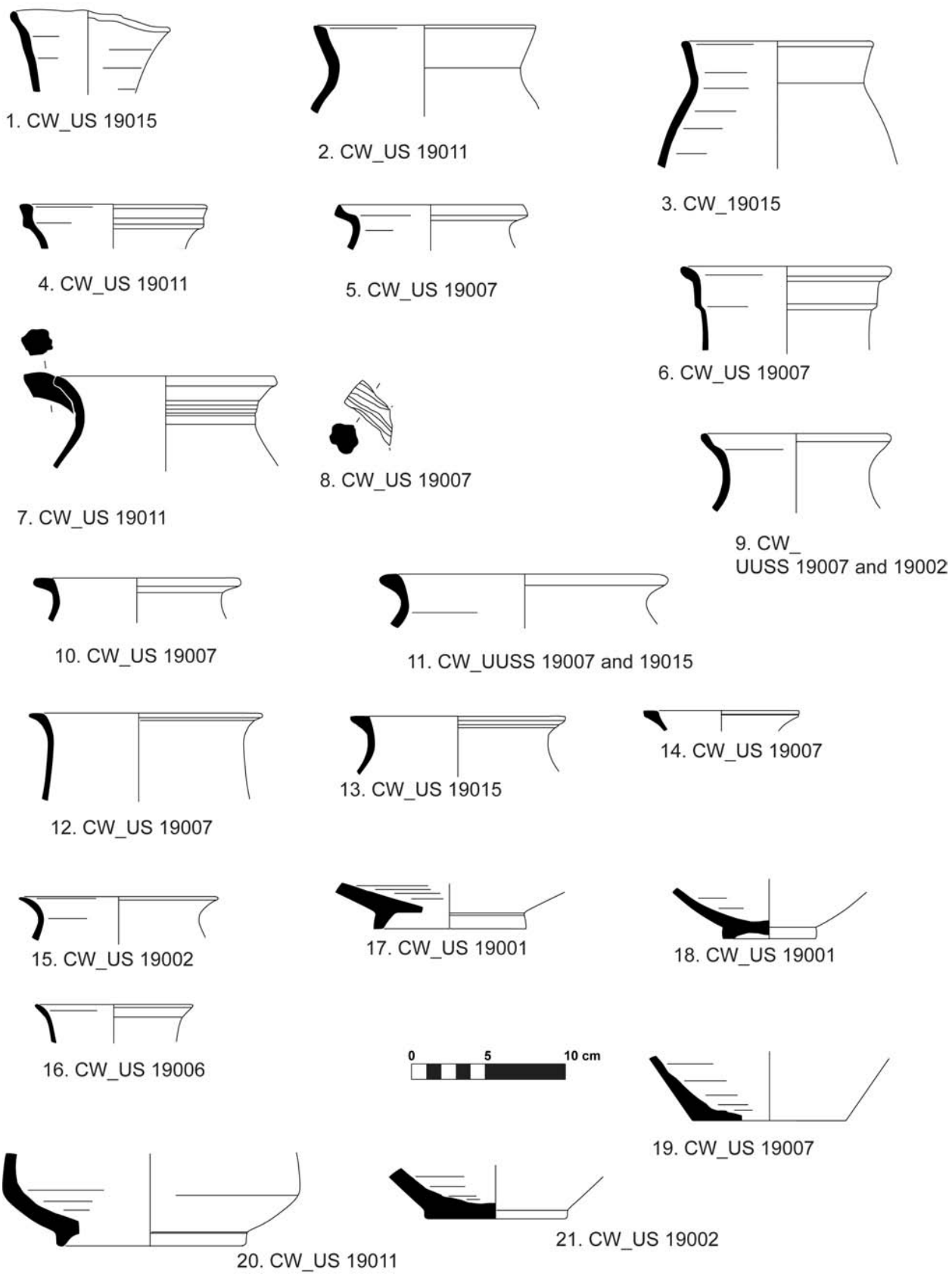


Fig. 11.31 Tombarelle, Area II, Phase 1, Coarse ware (CW) jugs (1–21) (EV).

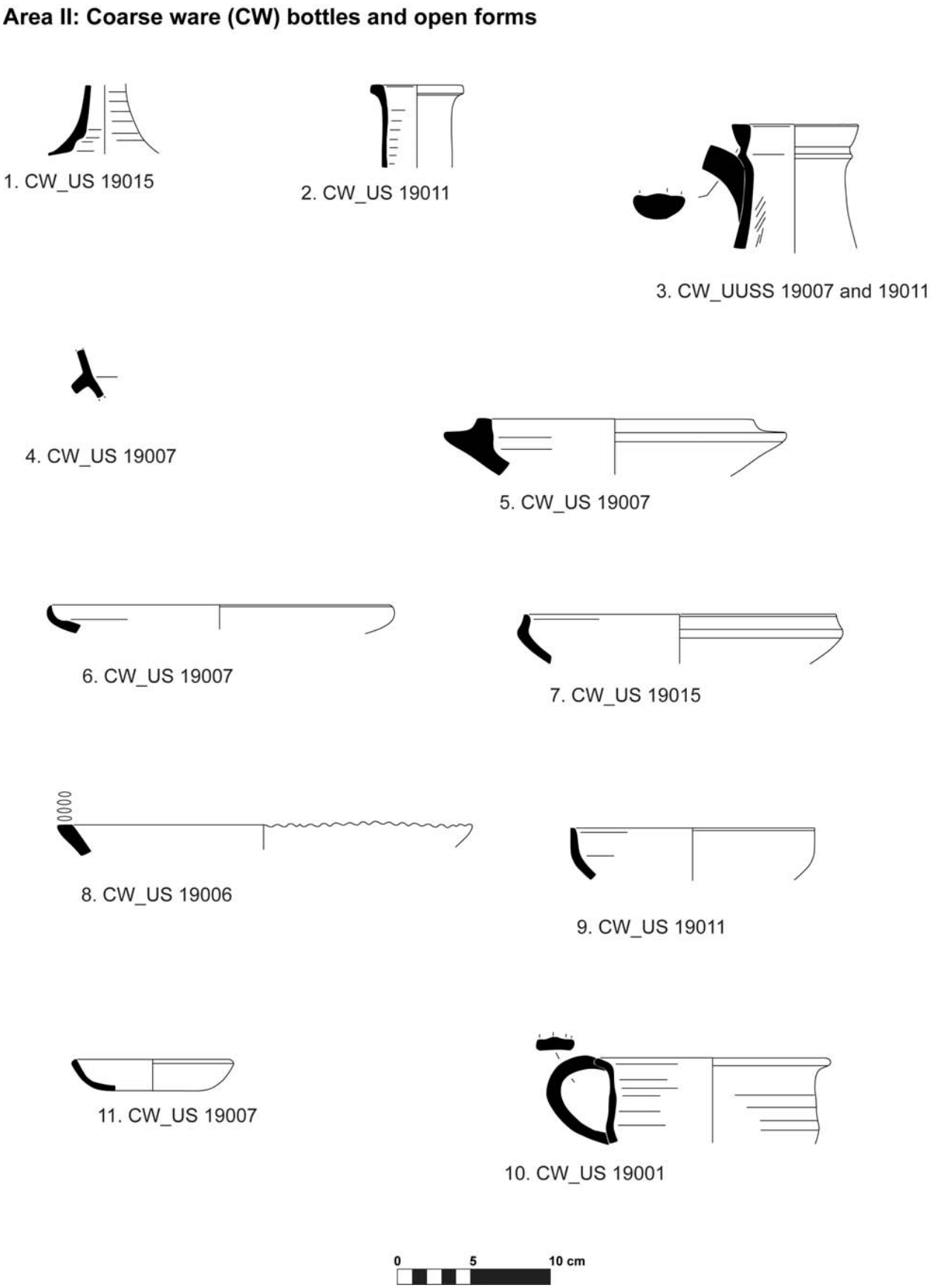


Fig. 11.32 Tombarelle, Area II, Phase 1, Coarse ware (CW) bottles and open forms: 1–3. Bottles; 4–5. Mortaria/ flanged-bowls; 6–7. Dishes; 8–9. Bowls; 10. Handled-bowl; 11. Small cup (EV).

body applied "cordonatura." The shape is paralleled at other project sites in the 1st BC (Vaccaro and MacKinnon 2014:235, fig. 2, n. 5). Lids (6.42%) (see Fig. 11.28.6–10) are likely to have been used in combination with cooking pots (hence for boiling) rather than to cover wide-mouthed open vessels. Open cooking vessels are dominated by *tegami* (4.58%), and also included a very fragmentary legged skillet (see Fig. 11.29.10) of a type found in Cosa in deposits ranging from the 2nd c. through the end of the 1st c. BC (Dyson 1976:54–55). Finally and unusually, some 5.5% of kitchen vessels were comprised of *clibani*, a sort of portable oven found in Central Italy and likely to be used for both baking and cake making (see Fig. 11.28.1–5).

This general balance between vessels used for liquid versus dry cooking, which is a long term trend at the site, may correspond with the faunal analysis (see below), which, although it found a lack of burning and other indicators pointing to roasting, did document a significant number of large cuts that may have been served as roasts.

11.5.2 Phase 2 (Area IV)

Twenty-nine MNI of sherds were documented in Area IV (Figs. 11.33 and 11.34). The total absence of Black glazed ware suggests that the deposits are well beyond the Black glazed/Italic sigillata transitional period (of Area II) and the Italic sigillata types are all consistent with an Augustan (mid/late) to Tiberian date, similar to the abandonment of the pressing site at Case Nuove (Fig. 11.33.1–5).

The overall quantity (20.68%) of fine wares is among the lowest in the project area. None of these Italic sigillata productions could be definitively attributed to the production site at Marzuolo and most fall between that site's well-documented production phases in ca. 30 BC and 50–70 AD.

SU 18002 yielded a large quantity of tile wasters as well as four ceramic wasters (three in fabrics similar to those found in Area II) (Fig. 11.33.11, 13–14, 18) and a possible kiln spacer (SF 518004). This local ceramic production seems to have focused on tablewares as documented by the wasters of jugs and dishes with inverted rim. This suggests that some coarse ware production took place at the same time as tile manufacturing, including a type of jug with everted rounded rim and thick strap handle (Fig. 11.33.11), another two jug types represented respectively by slightly concave base and a disk-footed bottom (Fig. 11.33.13–14) and one type of dish with slightly inverted rim (Fig. 11.33.18).

Only two amphorae are documented: one is the local early/mid Augustan small type (Fig. 11.33.7) found and possibly produced at Marzuolo and also attested in Area II, while the other one is a Dressel 2/4 from the Ager Cosanus datable from the late 1st c. BC to the 1st c. AD (Fig. 11.33.6).

Not surprisingly, most of the materials documented in Area IV seem to derive from local and/or regional sources. The exceptions are the sigillata as well as 2 MNI of kitchen ware and 2 MNI of *vernice rossa interna* (Fig. 11.34.6–8) all imported from sources located in a volcanic area in very southern Tuscany or Lazio. Among the imports are a Vogelkopflampe (swan-head decoration) Dressel 4 lamp of Augustan to Tiberian date, likely produced in Rome (Brando 2015:176).

As with the previous phase, table-storage vessels used for containing liquids and/or semi-liquids were the most abundant functional class. These included a preponderance of coarse ware jugs (24.13%) some of which (described above) were manufactured on or near site, while others, (Fig.11.33.9–10, 12, 15) come from elsewhere. The large numbers of table jars found in Area II are not as abundant here, with only 1 MNI (Fig. 11.33.16). Also notable are a number of Italic sigillata cups (6.89%), such Conspectus 38 (Fig. 11.33.1), well documented in both Italic sigillata and Experimental sigillata at Marzuolo in the period 30/20–10 BC. The ring-footed base of Figure 11.33.2 refers to an unidentifiable cup.

Again, next in quantity are open form tableware, particularly dishes (17.24%) including Italic sigillata dishes in Conspectus 1, Conspectus 4, Conspectus 20, and Conspectus 18 (11), as well as a locally manufactured coarse ware dish (Fig. 11.33.1–5).

Cooking patterns differed somewhat from both Phase 1 and from other sites in the project. Phase 2/Area IV noted a slightly higher percentage of vessels involved in the preparation of solid, dry food (17.22%), as opposed to those for stewing/boiling (10.34%). Open-form kitchen wares included an imported casserole with thickened double-stepped rim (Fig. 11.34.4) and a cooking bowl with impressed oval decoration both on top of the rim and two parallel bands

of the wall (Fig. 11.34.5). The high quantity of open forms is largely due to 3 MNI of *tegami* in *vernice rossa interna* (Fig. 11.34.6–8), similar to those from Marzuolo. Closed form kitchen wares included only 3 MNI of cooking pots, including a type with everted thickened rim (Fig. 11.34.1) with parallels at Marzuolo in the early/mid Augustan contexts. Two bases (one flat and one ring-footed) should refer to cooking pots too (Fig. 11.34.2–3). The ring-footed base should be an import from a volcanic area.

Unfortunately, the faunal remains from Area IV were two lacunose and intrusive to provide any comparanda to the trends noted here. Thus, an emphasis on roasting/baking of foods should not be too greatly stressed.

11.5.3 Phase 3 (Area III)

One hundred and ninety MNI from a total of seven well-stratified contexts were processed, corresponding principally to the two fills SU 17002 (81 MNI) and 17003 (95 MNI), as well as the floor make ups beneath (Tables 11.5–11.6; Figs. 11.35–11.45).[1] All date to the late antique period, concentrating on the first half of the 5th c. AD. As these constitute the largest group of late antique ceramics from the project and indeed, even regionally, they are described below in detail.

A series of indices suggested that the fills SU 17002 and 17003 all took place in a single moment and that large ceramic pieces were deliberately selected to quickly fill these two spaces. Joins were found between SU 17002 and 17003 as well as SU 17003 and 17008—situated in two different spots of Area III—as well as between SU 17002 and 17019, and 17002 and 17008.[2] Furthermore, the various measurements of EVE point to relatively low vessel fragmentation and a correspondingly relatively high fragment size in these fills (Table 11.7). Mean EVE is 23.66%, while mode and median are 25% and 18% respectively—some of the highest in the project. We have chosen to analyze SU 17002 and 17003 together, and this comprises the majority (175 MNI) of the total late antique ceramics (190 MNI).

The most widely documented class all throughout the Phase 3 assemblages is Color-coated ware with 121 MNI out of 190 (63.68%), a class of table and storage vessels with red coating produced at a local and regional scale (Table 11.6; Figs. 11.35–11.42). This class is well documented in Tuscany from the mid-Roman period onwards, and its production and distribution tends to increase in late antiquity at both coastal and inland sites (Vaccaro 2014, 2015). At Tombarelle, the red coating tends to vary markedly from vessel to vessel both in color (from orange/red to dark brown) and quality. We attempted to class this variation through visual analysis with a magnifying lens, trying to determine in section which vessels were characterized by better quality coating, i.e., which ones had been fired at high temperature (around 1,000°–1,100° degrees) and which had not. The results presented in Table 11.8 show that the majority of Color-coated wares at Tombarelle have non-sintered coatings, although semi-sintered and fully sintered coatings are present. Interestingly, both sintered and non-sintered coatings are associated with the same fabrics, indicating workshops where the local technology and, thus, quality was not always consistent. This may have been determined by the different skills of the potters involved and their ability to successfully fire their vessels at very high temperatures (over 1,000°) or to variations in the chemical composition of the clays used to make the coating.

Also important to note is a significant quantity (11.57% out of 121 MNI) of highly overfired and occasionally deformed Color-coated ware vessels both in SU 17002 and 17003 (Table 11.8 and Fig. 11.42). The level of overfiring is so marked to turn the fabric dark grey and the coating dark brown. The fabric of these overfired wares does not really differ from the other fabrics except for color. Overfired vessels may have been sold on the market as second-quality products, yet the consistent presence of these materials always with the same fabric at late Roman Tombarelle may suggest either local production or the presence of a workshop quite close to the site. It is also worth noting that the same ceramic types characterized by overfiring are documented at Tombarelle with well-fired specimens (infra). On-site production of Color-coated ware is further reinforced by the presence of the pit likely linked to clay extraction and to the paved structure interpreted as a ceramic drying facility (see above).

The most striking difference between Tombarelle and the other 5th c. sites excavated by the project (Pievina and Case Nuove) is the complete absence of imported African red slip ware. This class was

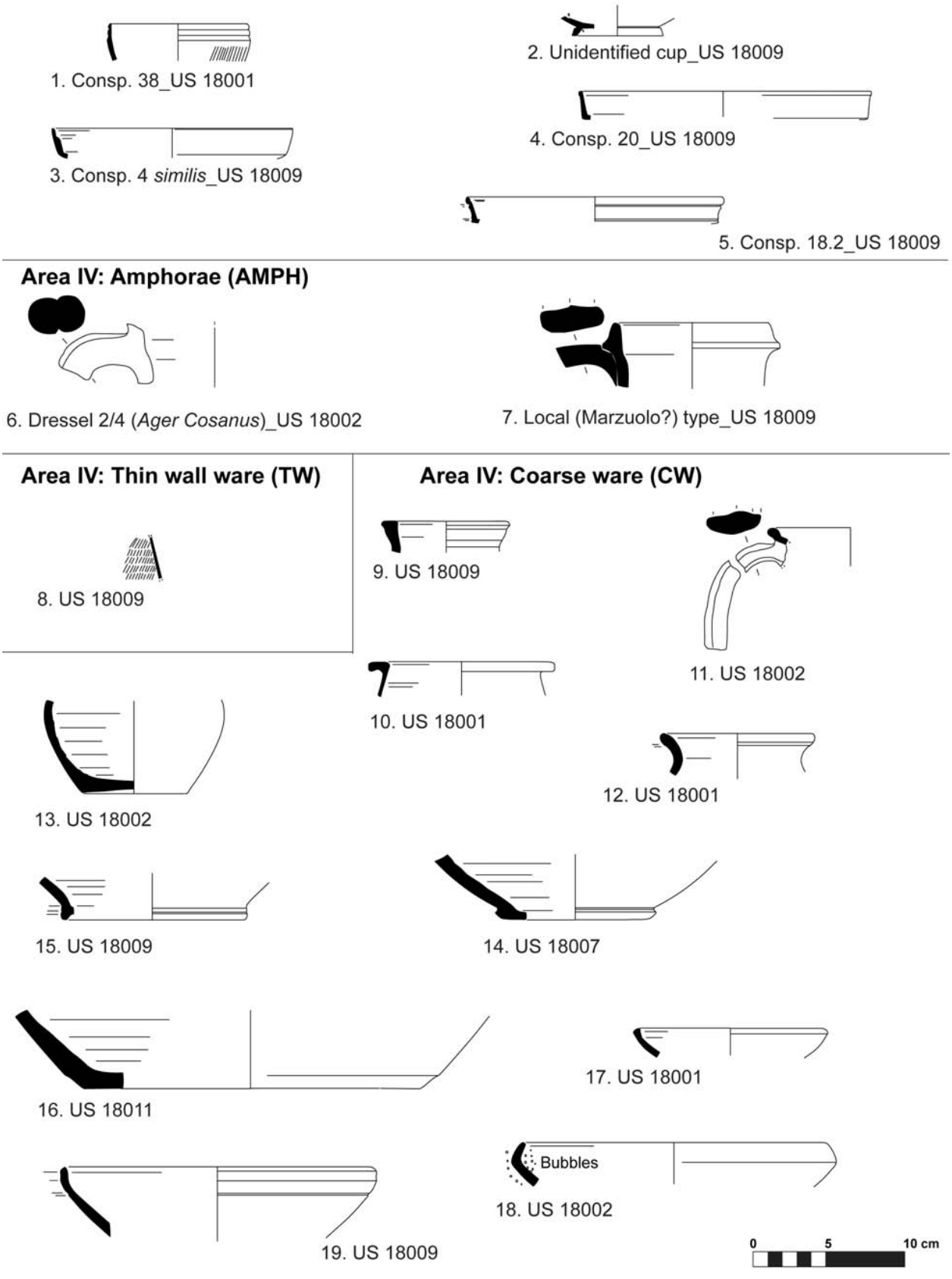


Fig. 11.33 Tombarelle, Area IV, Phase 2, Italic sigillata (IT SIG), amphorae (AMPH), Thin wall ware (TW), Coarse ware (CW): 1. Conspectus 38 cup (IT SIG); 2. Unidentified cup (It Sig); 3. Conspectus 4 *similis* dish (IT SIG); 4. Conspectus 20 dish (IT SIG); 5. Conspectus 18.2 dish (IT SIG); 6. Dressel 2/4 (*Ager Cosanus*) (AMPH); 7. Local (Podere Marzuolo production?) amphora (AMPH); 8. Closed for with feather rouletting (TW); 9–10, 12, 15. Jugs (CW); 11, 13–14 Jug wasters (?) (CW); 16. Jar (CW); 17. Small cup (CW); 18. Dish (waster?) (CW); 19. Large bowl (CW) (EV).

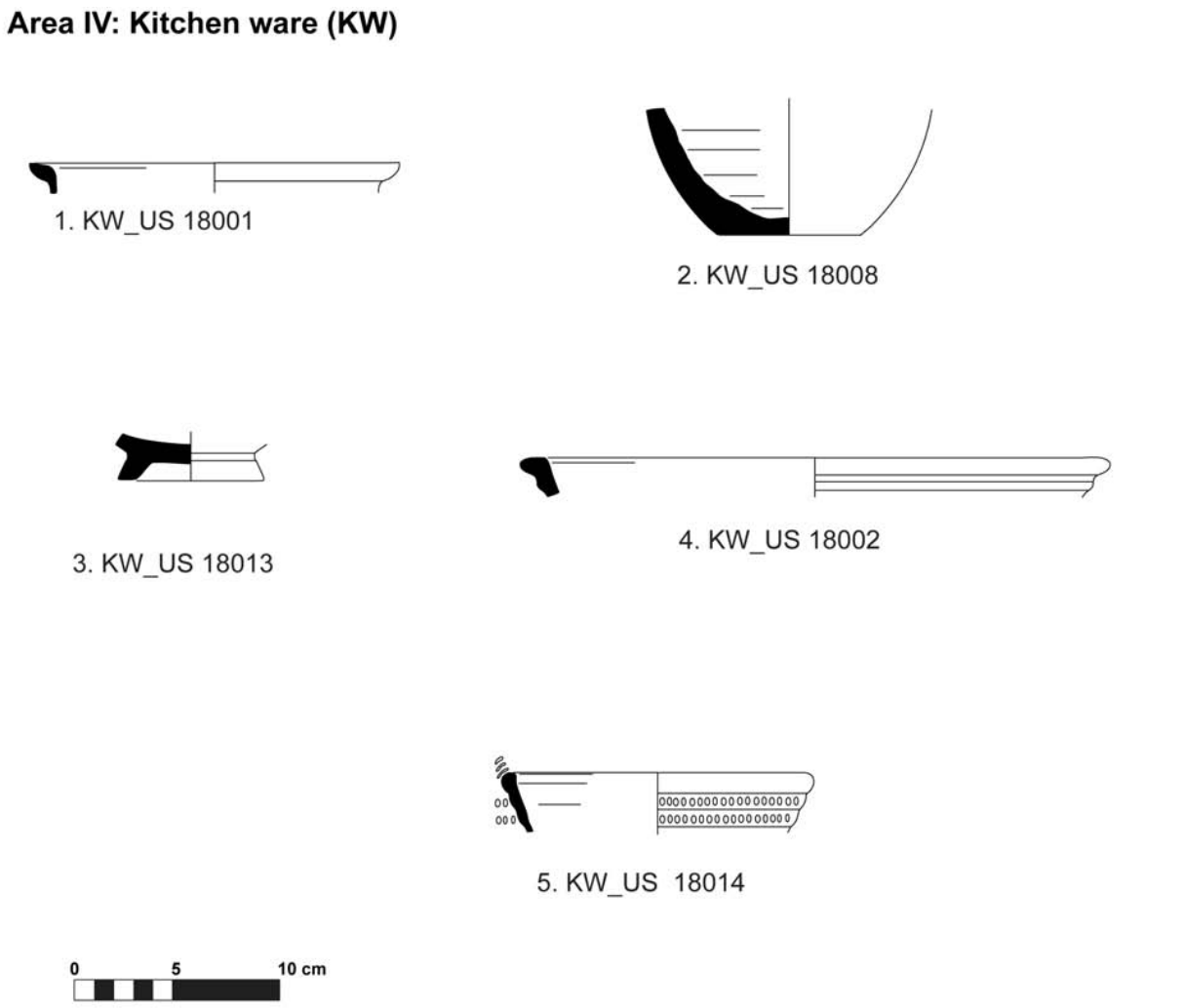


Fig. 11.34 Tombarelle, Area IV, Phase 2, Kitchen ware (KW) and *vernice rossa interna* (VRI): 1–2. Cooking pots (KW); 3. Small cooking pot (KW); 4. Casserole (KW); 5. Cooking bowl (KW); 6–8. Cooking pans/*tegami* (VRI) (EV).

documented at Pievina with 6.89% and at Case Nuove with just over 4% of all late Roman ceramics (see Chs. 4 and 5). Unlike Case Nuove, where African red slip was lower than at Pievina but counterbalanced by the high quantity of regional fine wares (*sigillata chiara tarda dell'Italia centro-settentrionale*), this latter class is also poorly attested at Tombarelle, with only 2 MNI in context SU 17008. Late Roman Tombarelle seems to almost exclusively rely upon the local and sub-regional markets for ceramic consumption. The exception to this rule is found, interestingly, from the fabric analysis of the kitchen wares. Some 9 MNI of kitchen ware were imported from a volcanic area situated in the most southern territories of Tuscany or Lazio.

Amphorae are very poorly documented in our late antique contexts (1.05%) (Fig. 11.41.1–2). These are represented by three fragments of an LR1 amphora, datable from the later 4th to the 5th c. AD (Piéri 2005). This is the only overseas import documented at late Roman Tombarelle. The other amphora is a wine-amphora type of local or sub-regional origin (Fig. 11.41.1). Although the shape is different from the so-called local/sub-regional amphorae found elsewhere in the territory of Cinigiano, such as Pievina (5th c. AD) and now the villa of Santa Marta (in the first half of the 6th c.), this amphora from Tombarelle is clearly part of an overall revival of wine production that took place in southern Tuscany and more generally in many areas of central and southern Italy from the 4th to the early 7th c. AD (Pecci et al. 2015; Vaccaro 2015).

The most common vessel types were those designed for liquids (jugs, pitchers, cups), followed by tablewares intended for solid foods (plates and the like). This corresponds with the late Republican deposits in Area II, suggesting long-term continuity in some ceramic use patterns, but contrasts with the overall late Roman trends from the project (see Ch. 14). Jugs, manufactured in Color-coated ware and coarse ware, are the most common closed form (8.42%) (Fig. 11.40.1–12). The most common type has a markedly everted rim ending in a rounded or slightly pointed lip, narrow neck and coplanar grooved strap handle (Fig. 11.40.1–10). Later examples of table jar/large jugs (Fig. 11.41.3–10) were also prevalent (7.89%), similar to that from Case Nuove Phase 2 (but not Pievina). The most common type has a slightly everted rim and strap grooved handle (similar to but wider than those of jugs); the mouth diameter varies from 12 to 14 cm (Fig. 11.41.3–5). Bottles are less common than jugs (3.15%). The best documented type has a trefoil-mouthed rim, cylindrical neck and narrow shoulders (Fig. 11.40.13–14). Finally, only two examples of beakers or cups were found with quite thin walls and vertical undistinguished rims (Fig. 11.37.9–10) and two small lid types, one in Color-coated ware with flanged rim (Fig. 11.37.14), and a very shallow one in coarse ware bearing string marks on the exterior of the base (Fig. 11.37.15).

Open forms associated with dining were the next most common category including dishes (21.10%), bowls (9.47%), and basins (19.47%). Most common are the local Color-coated ware imitations of African red slip archetype Hayes 61A/B or 61B—a broad plate/bowl. The majority of them (Fig. 11.35) recall the variant Hayes 61A/B2, dated to the very beginning of the 5th c. AD. The second most common ARS prototype imitated locally is the flat-based dish Hayes 50, in its later variants A/B and B (dated by Hayes between the mid 4th-early 5th c. AD and slightly beyond), with at least 11 MNI (Fig. 11.36.7–14). These Color-coated ware dishes have flat bases, flaring walls and thin rims, sometimes pointed, internally cut, or undistinguished. Basins are among the most common form and occur in both Color-coated ware and coarse ware (Fig. 11.38–11.39). A well-documented type has a carinated wall and everted rim that can be just rounded, thickened or pointed, occasionally bearing a tiny groove on the outer face (Figs. 11.38.1–9 and 11.39.1–3). These vessels may have been used mostly for dining and/or storing purposes and, on the basis of their deep body (certainly deeper than the series of shallow dishes presented above), they should have been particularly suitable for containing liquid or semi-liquid foods and beverages. Finally, bowls are present (9.47%) in different sizes and shapes (Fig. 11.37.1–8, 12–13). The larger versions of these are differentiated from the basins by a shallower body and were probably more suitable for dining than storing purposes. The type with carinated wall and vertical rim externally grooved or plain can vary in size from 15 to 25 cm (Fig. 11.37.1–5). This type was also found in the late Roman contexts at Pievina. A more "classical" type is represented by the hemispheric small bowl illustrated in Figure 11.37.6–8. A wide-mouthed version of this type is manufactured in a highly overfired fabric and is illustrated in Figure 11.37.3.

Storage wares include only a single dolium and a peculiar thick-walled container with cutting marks

text continues on p. 410

Color-coated ware (CCW) and Color-coated ware/Coarse ware (CCW/CW): dishes imitating the ARS Hayes 61 type

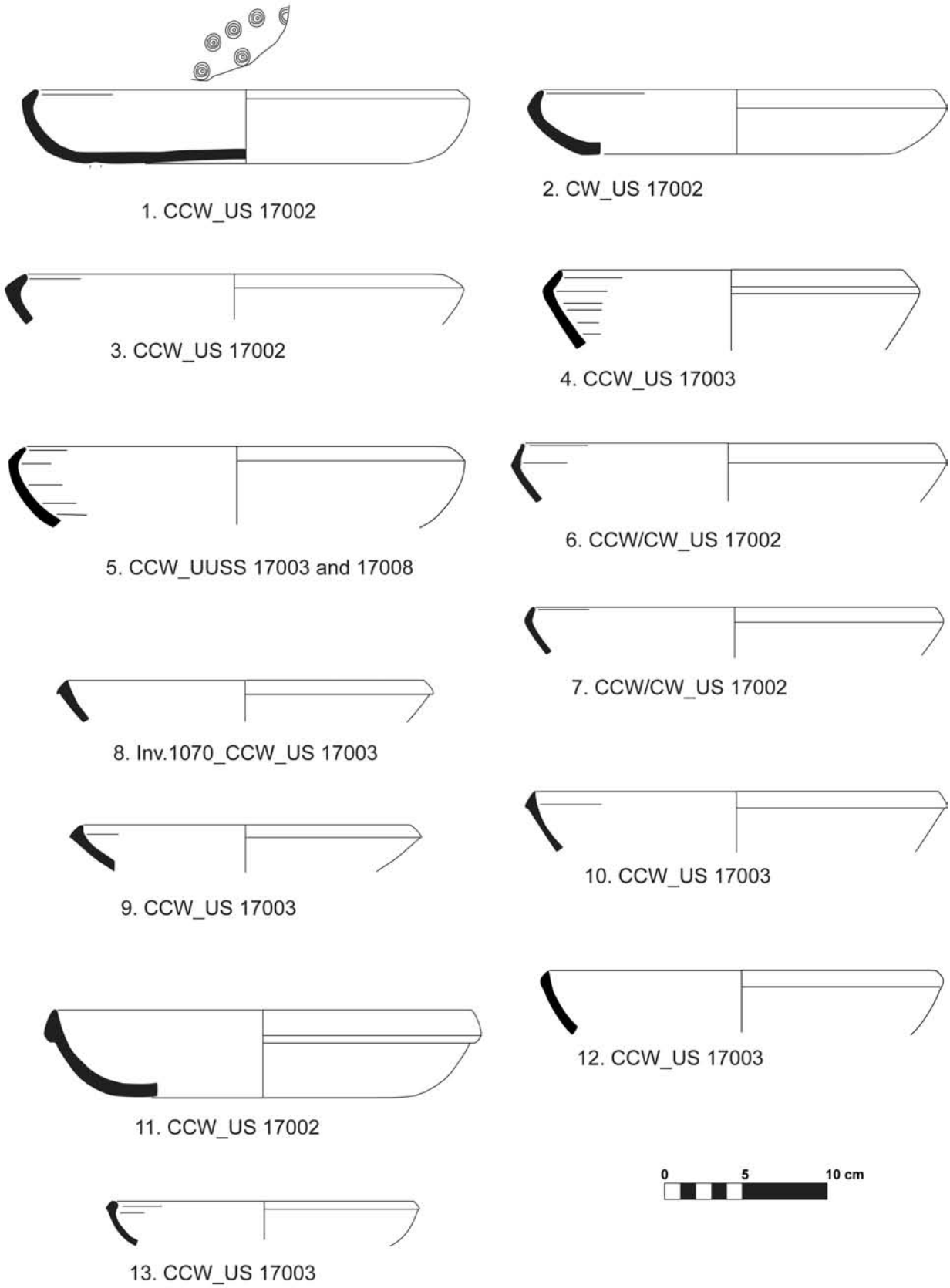


Fig. 11.35 Tombarelle, Area III, Phase 3, Color-coated ware (CCW) and Color-coated ware/Coarse ware (CCW/CW): 1–13. Flat-based dishes (of different size) imitating the ARS prototypes Hayes 61A/B and Hayes 61B (EV).

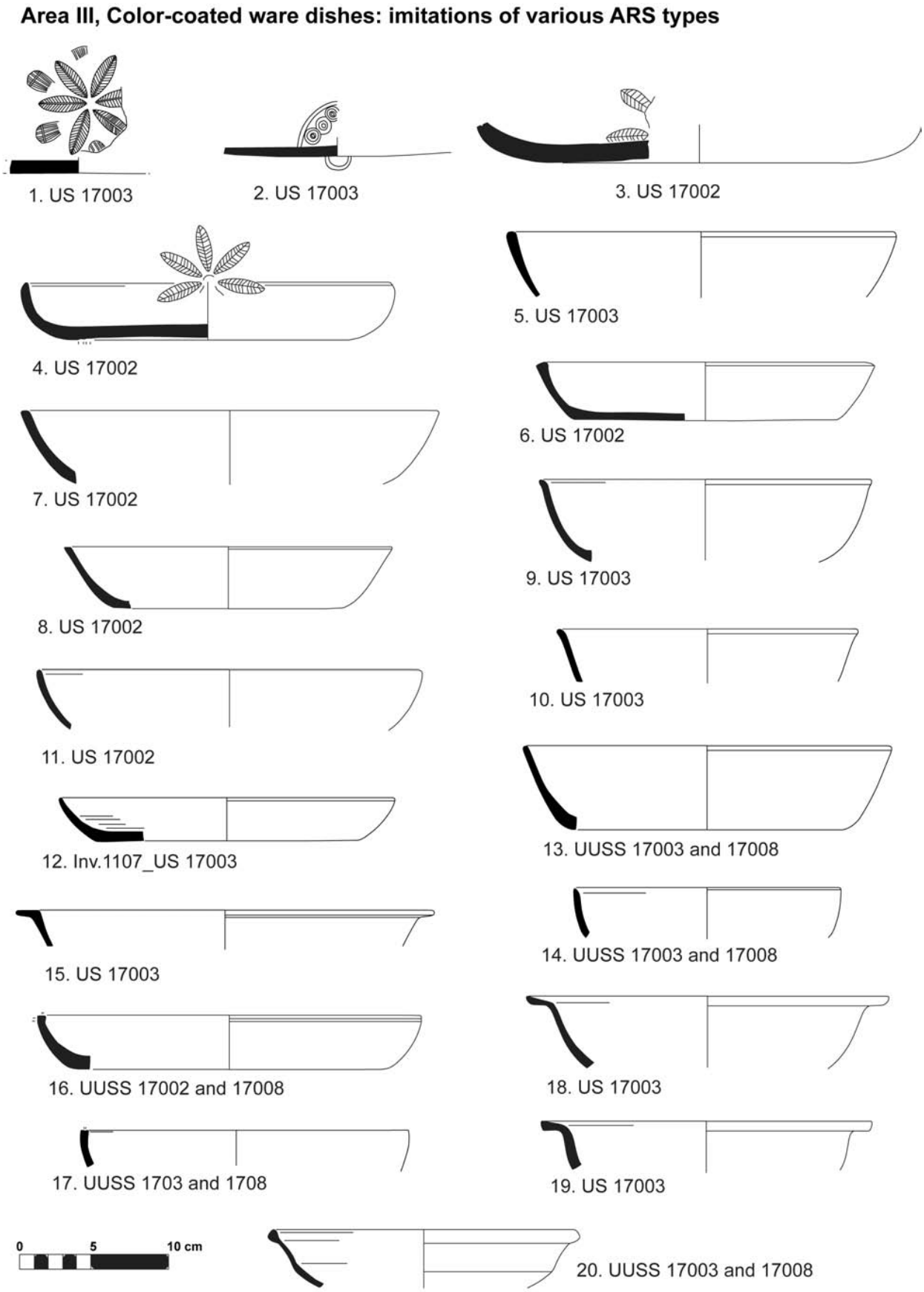


Fig. 11.36 Tombarelle, Area III, Phase 3, Color-coated ware dishes, imitations of ARS: 1, 3. Flat-based dishes with palmettes stamped decoration imitating ARS stamp Hayes A(ii); 2. Flat-based dish with stamped decoration of three concentric circles imitating ARS stamps of style Hayes A(ii)–(iii); 4–6. Dishes imitating ARS Hayes 62; 7–14. Dishes imitating ARS types Hayes 50A and Hayes 50B; 15. Dish imitating ARS type Hayes 58B; 16–17. Dishes imitating ARS Hayes 62/64 type; 18–19. Flat-based dishes imitating ARS type Hayes 59; 20. Dish with carinated body imitating ARS type Hayes 67/71 (EV).

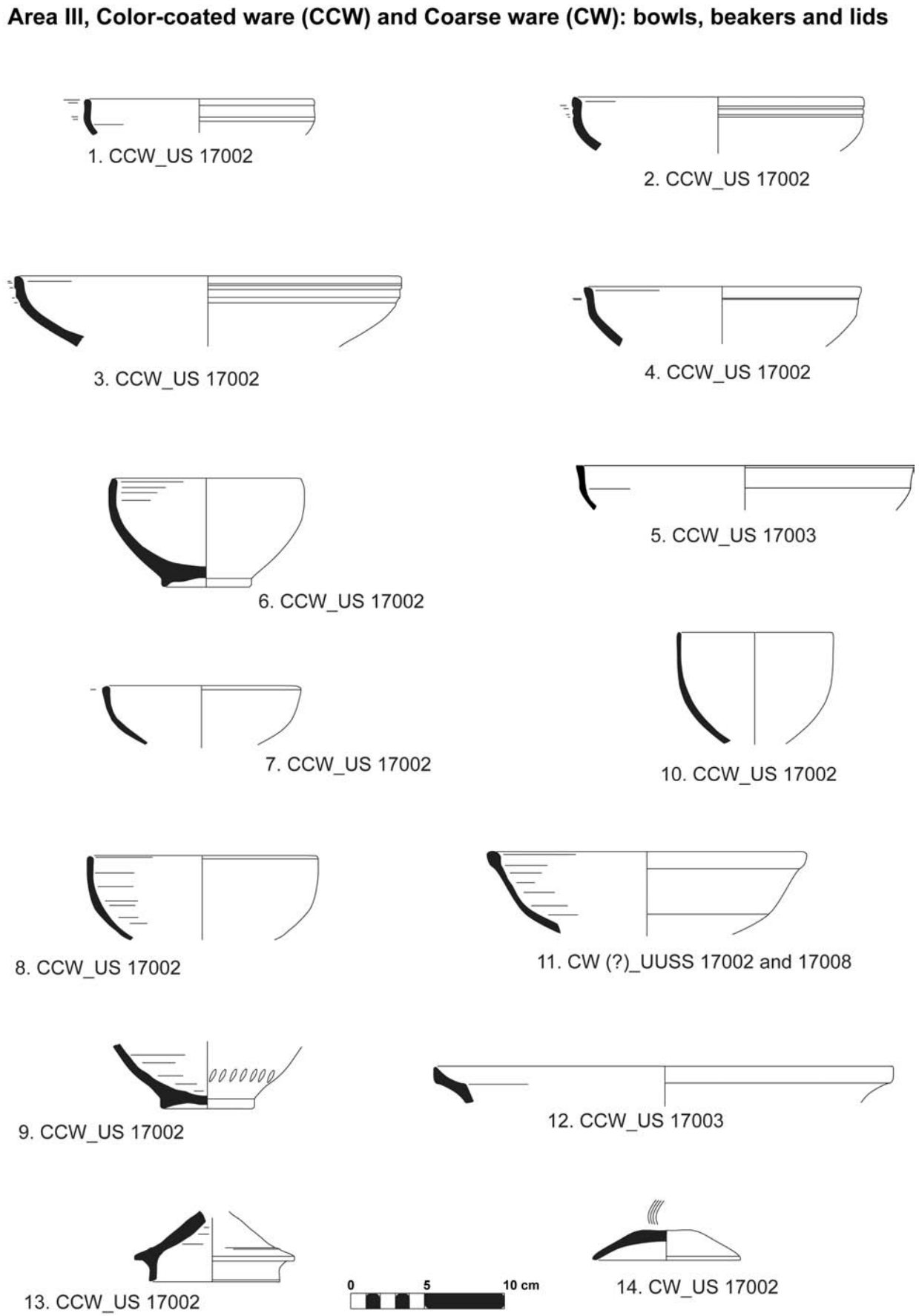


Fig. 11.37 Tombarelle, Area III, Phase 3, Color-coated (CCW) and Coarse ware (CW) bowls, beakers and lids: 1–8 and 12–13. Bowls; 9–10. Beakers; 14–15. Lids (EV).

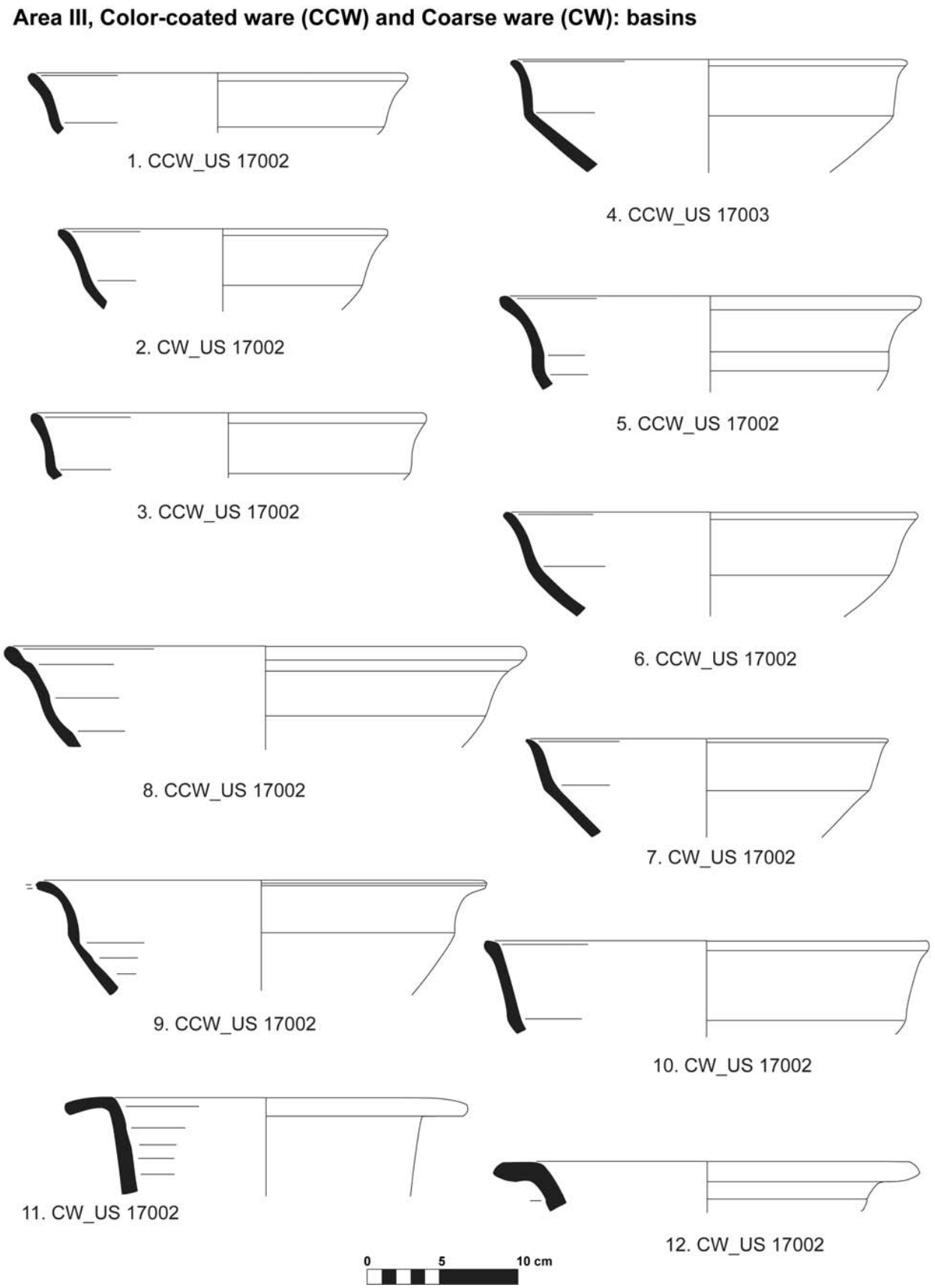


Fig. 11.38 Tombarelle, Area III, Phase 3, Color-coated (CCW) and Coarse ware (CW) basins (EV).

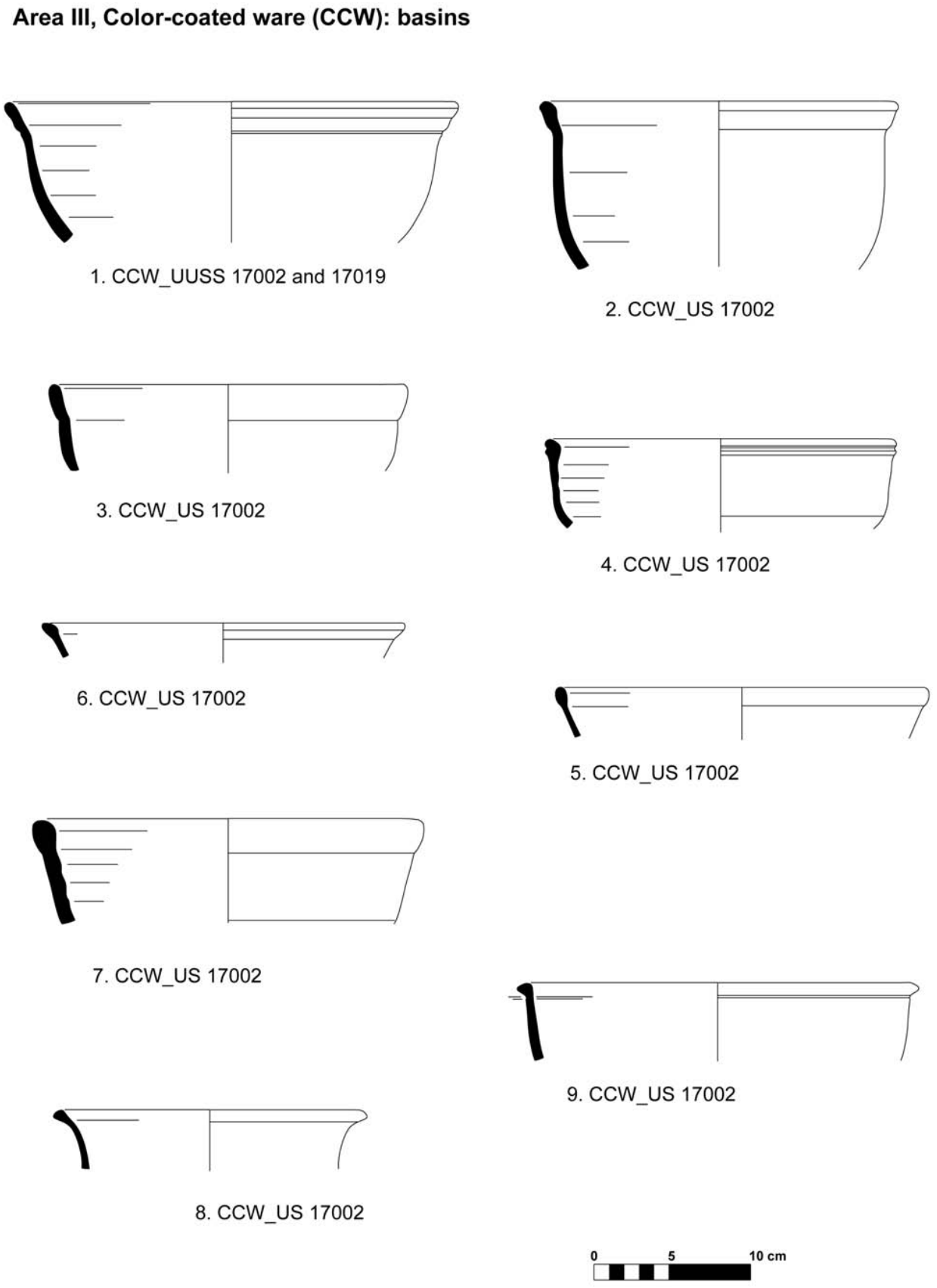


Fig. 11.39 Tombarelle, Area III, Phase 3, Color-coated (CCW) basins (EV).

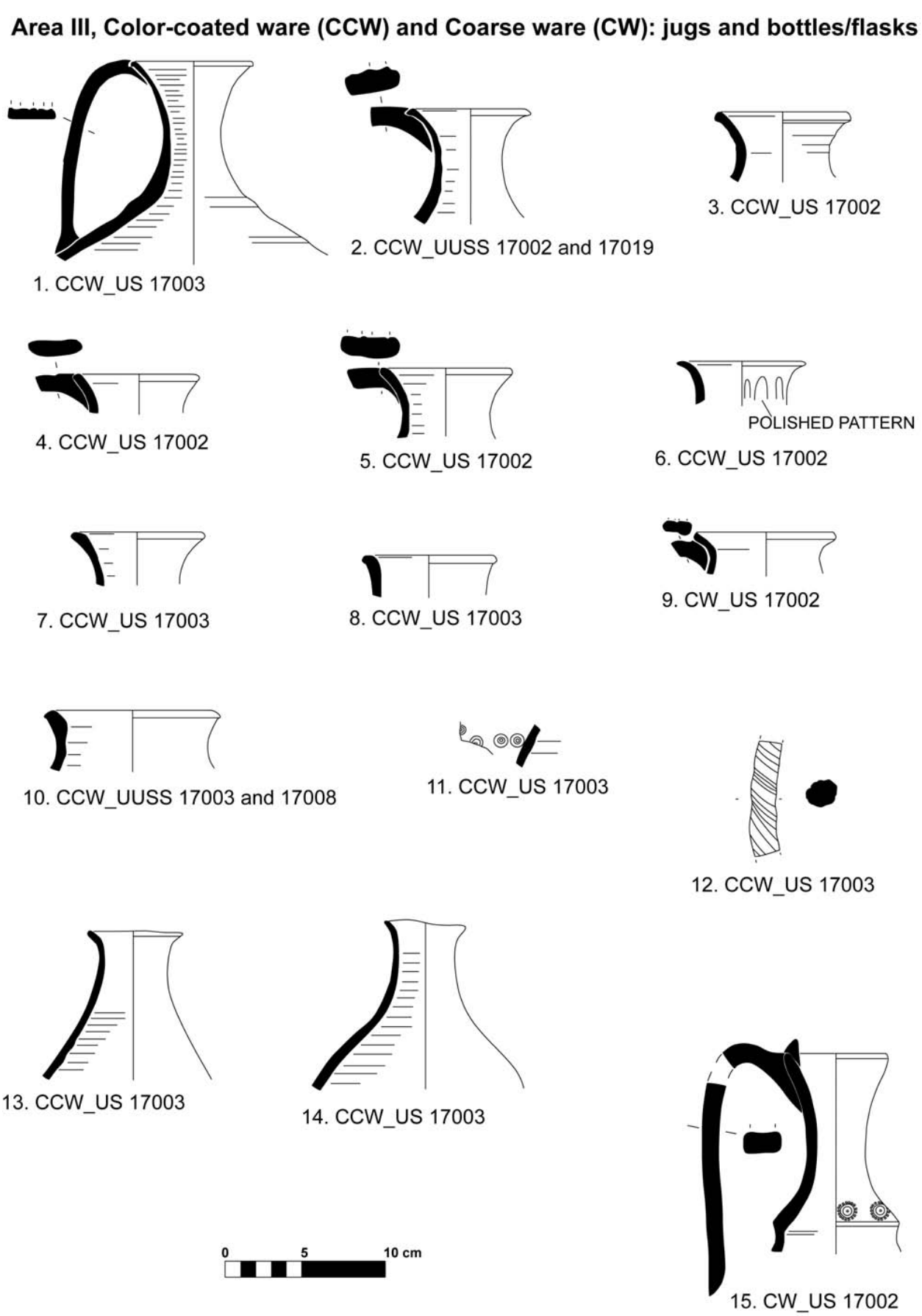


Fig. 11.40 Tombarelle, Area III, Phase 3, Color-coated (CCW) and Coarse ware (CW) jugs and bottles/flasks: 1–12. Jugs; 13–15. Bottles/Flasks (EV).

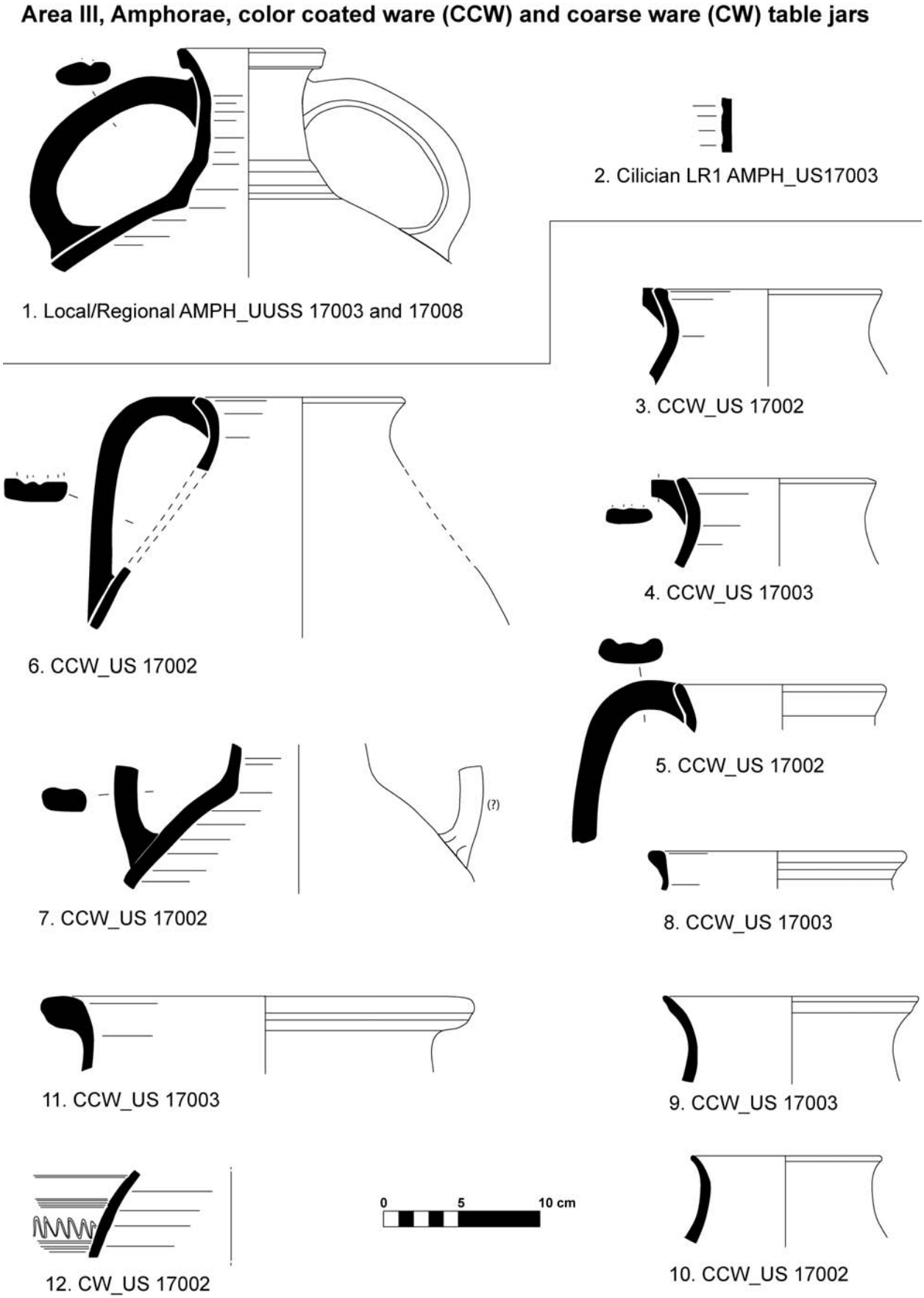


Fig. 11.41 Tombarelle, Area III, Phase 3, amphorae, Color-coated (CCW) and Coarse ware (CW) table jars: 1. Local/regional amphora; 2. Cilician LRA 1; 3–10. Table jars (EV).

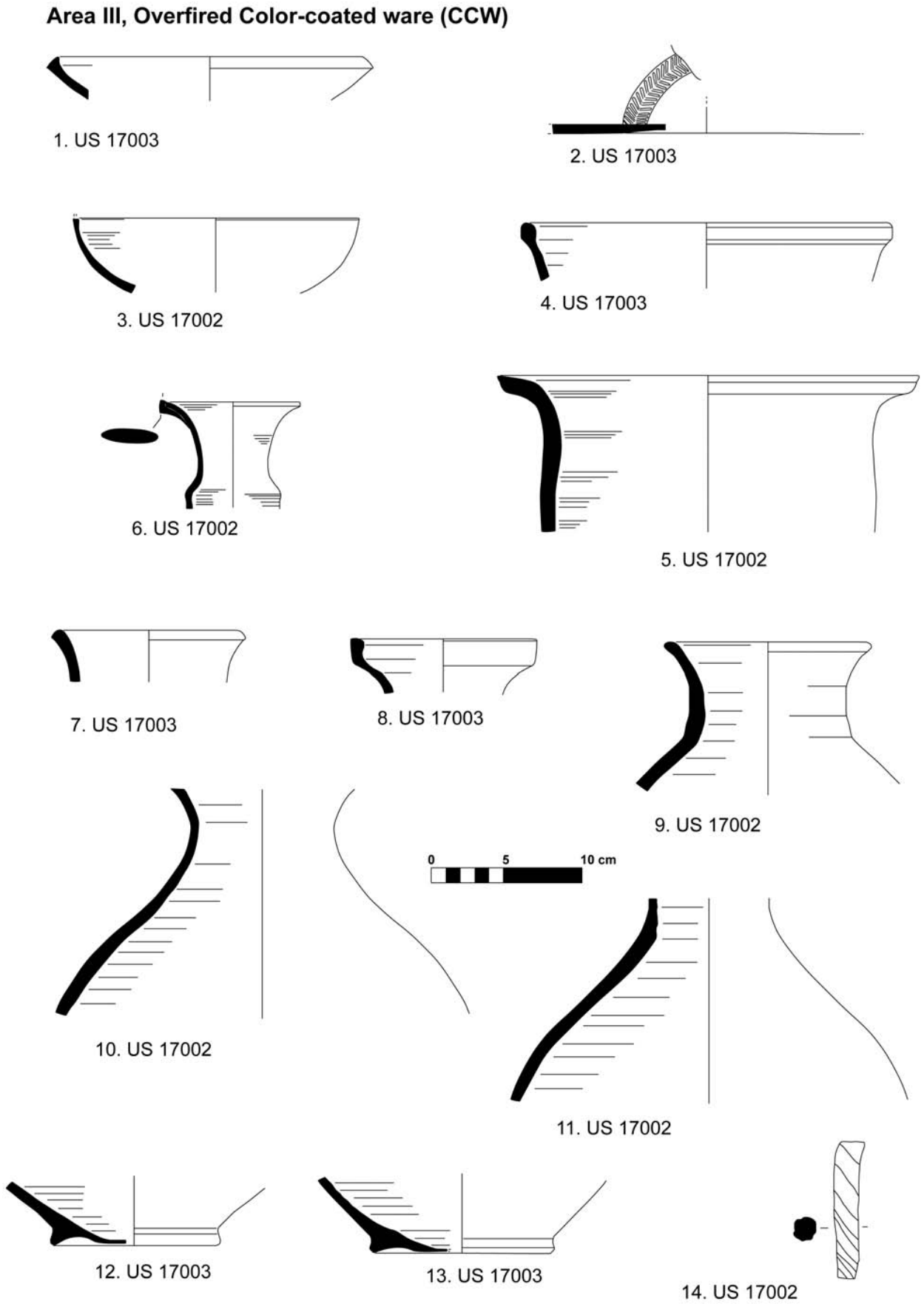


Fig. 11.42 Tombarelle, Area III, Phase 3, overfired Color-coated ware (CCW): 1. Flat-based dish imitating the ARS Hayes 61 type; 2. Flat-based dish with stamped floral decoration; 3. Hemispherical bowl; 4–5. Basins; 6–14. Jugs (EV).

Area III, *Opus doliare* (OD) and Coarse ware (CW): food processing vessels and measuring cups (?)

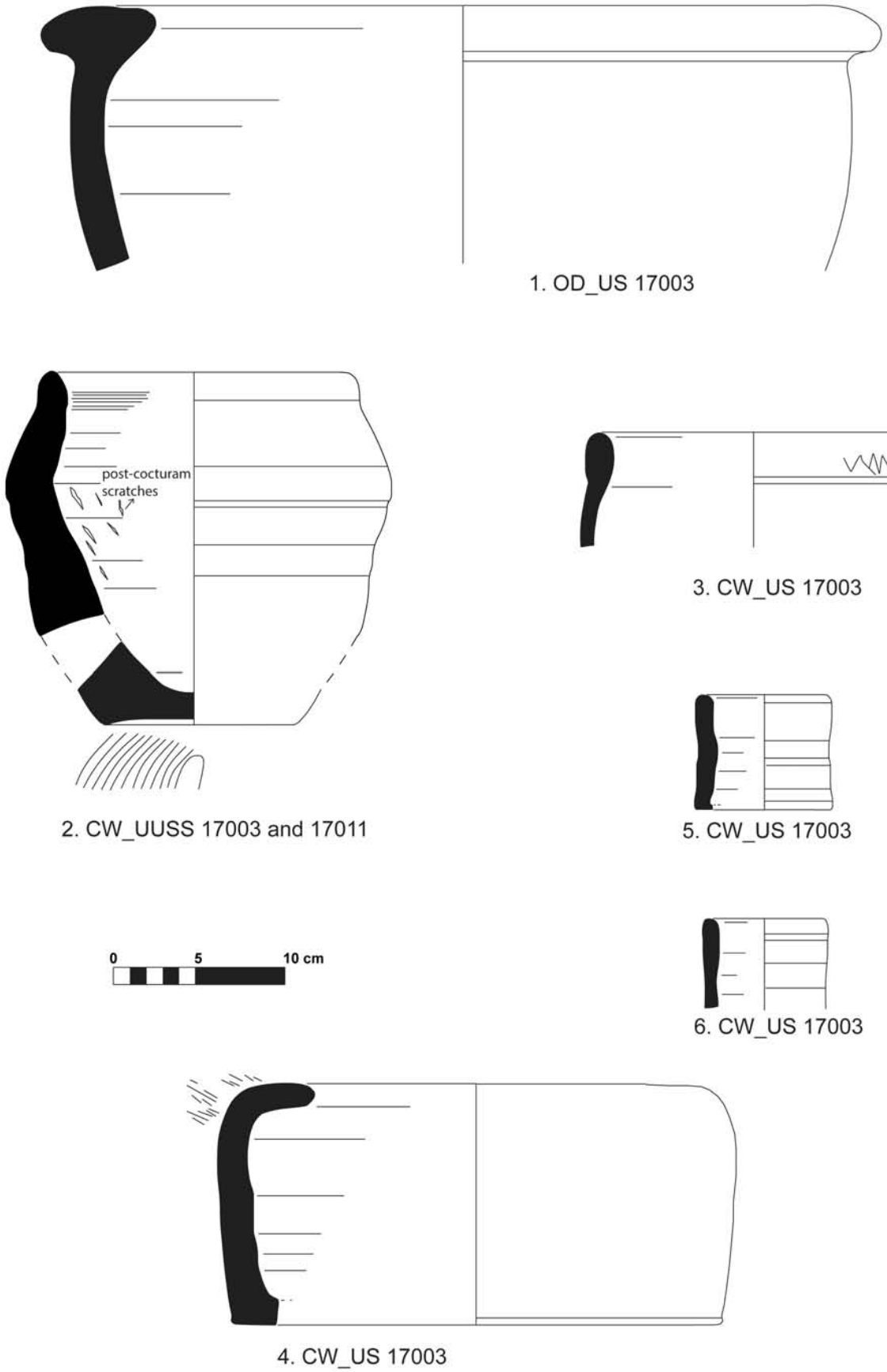


Fig. 11.43 Tombarelle, Area III, Phase 3, *opus doliare* (OD), Coarse ware (CW) food processing and measuring cups: 1. Large basin (OD); 2–4. Food-processing vessels (CW); 5–6. Measuring cups (CW) (EV).

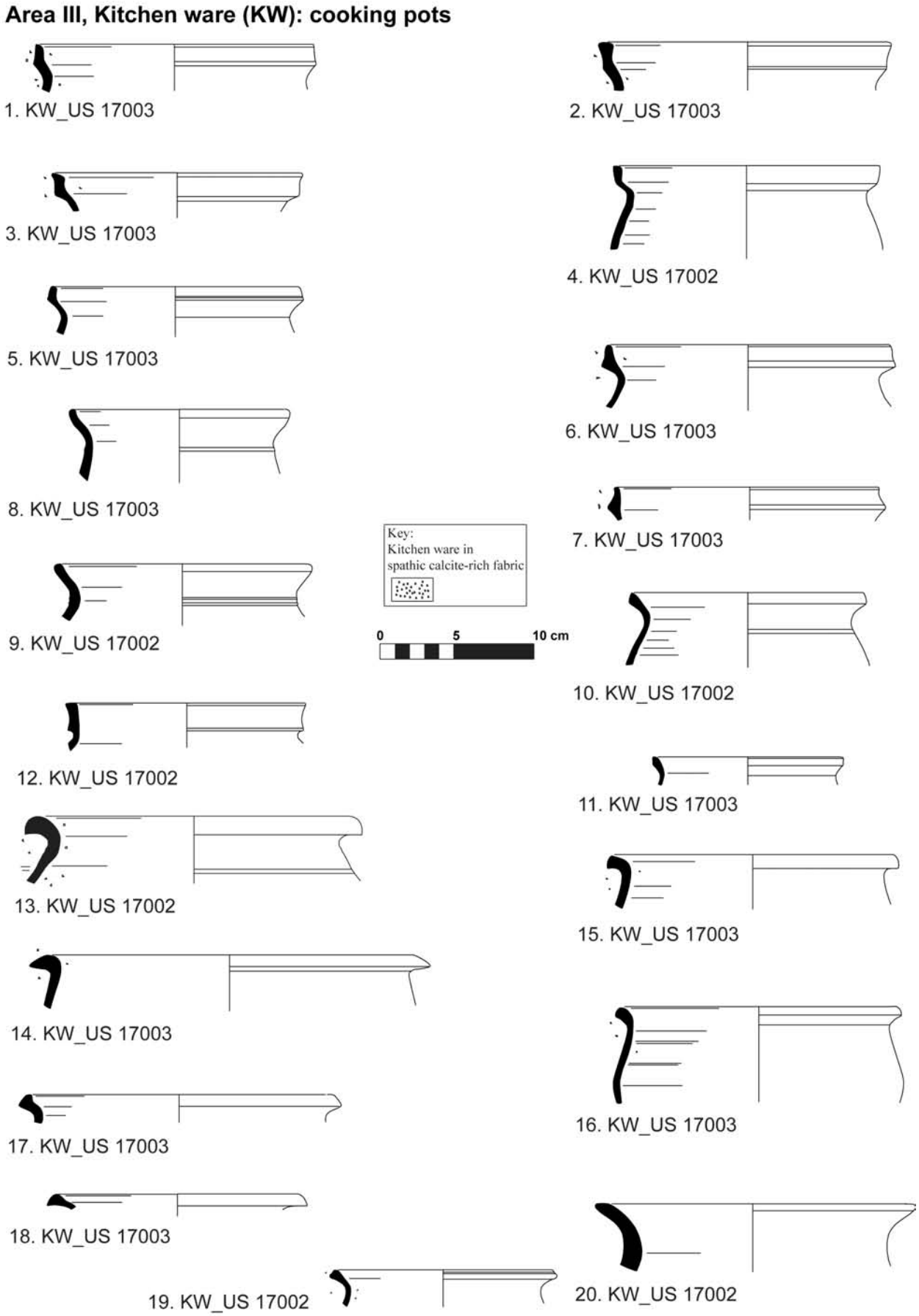


Fig. 11.44 Tombarelle, Area III, Phase 3, cooking pots (EV).

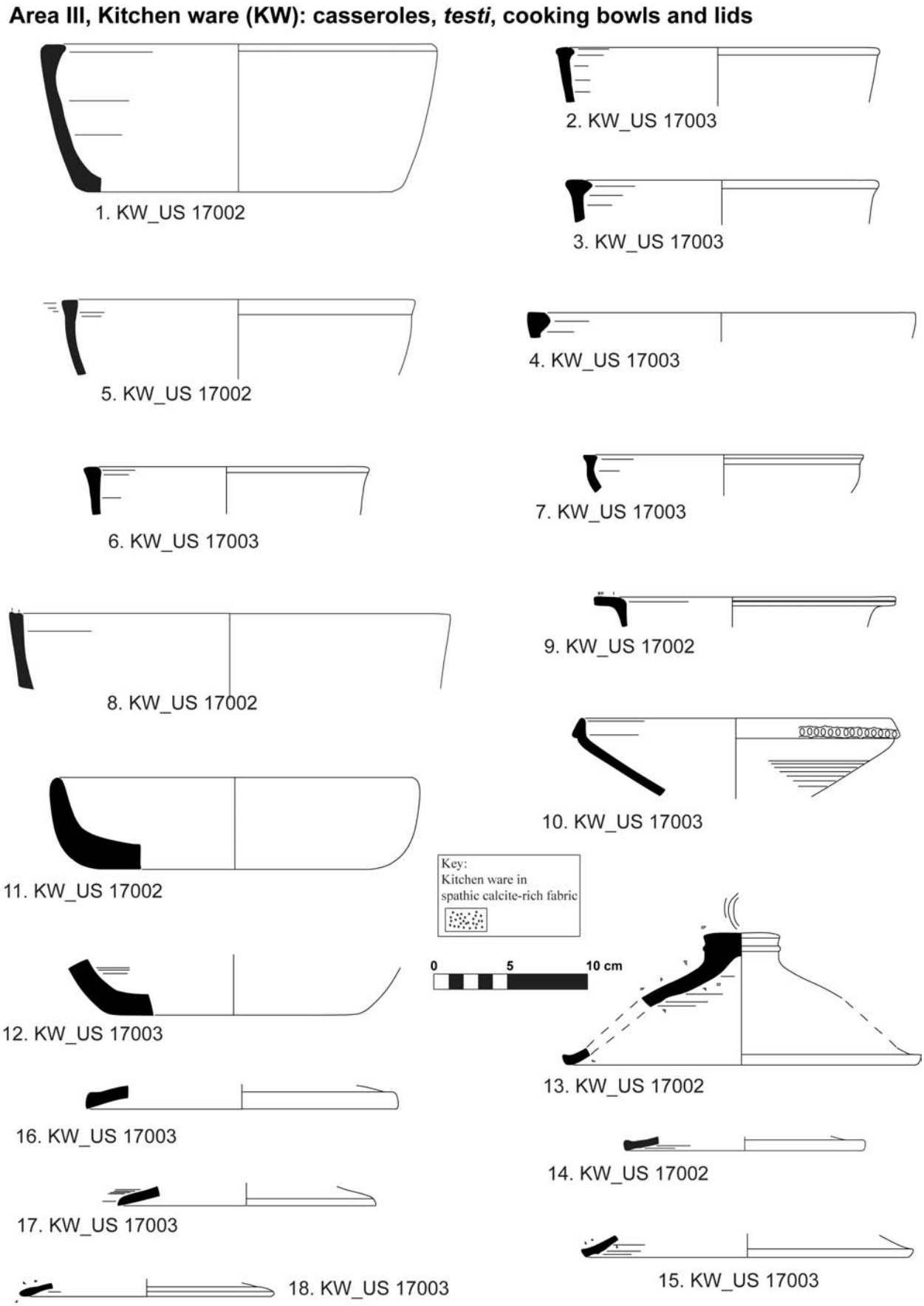


Fig. 11.45 Tombarelle, Area III, Phase 3, Kitchen ware (KW): casseroles, *testi*, cooking bowls and lids: 1–9. Casseroles; 10. Cooking bowl; 11–12. *Testi*; 13–18. Various-sized lids (EV).

inside and some 22.5 cm high, possibly used for food preparation (Fig. 11.43).

Kitchen ware, in general, is well-documented at late Roman Tombarelle but in lower quantities (21.57%) than other functional classes, as is typical for project sites (Figs. 11.44 and 11.45). Closed cooking pots were the most prevalent form of kitchen ware (11.57%). Nine examples have a spatic-calcite fabric which as noted in Chapter 5 (Case Nuove), offers a better resistance to thermal shocks, and hence a better quality (Fig. 11.44.1–3, 6–7, 13, 15–16, 19). Apart from this, levels of standardization varied widely even in the case of specimens of the same general type. For instance, the type with band-shaped rim is well attested with the variant with sub-vertical thickened rim (Fig. 11.44.1–5) and is manufactured in different fabrics. This is also documented in a variant with slightly hooked rim (Fig. 11.44.13–14).

Open formed cooking wares were also present, albeit in smaller quantities. The casserole (4.73%) is the best documented form, particularly the type with slightly flaring walls, flat base, and thickened inverted rim (Fig. 11.45.1–9). The cooking bowl with triangular-shaped rim decorated with an external "cordonatura" motif and very flaring walls is documented by one largely preserved MNI from context SU 17003 (Fig. 11.45.10). *Testi* or baking pans (1.57%) are documented by slow-wheel thrown specimens (Fig. 11.45.11–12). Finally, cooking lids (3.15%) have button-shaped bases (used to handle them) and, as illustrated in Fig. 11.45.13–18, quite a wide morphological variety of rims. The mouth size varies too from 15 to 22 cm. Considering the sizes of both cooking pots on the one hand, and casseroles and cooking bowls on the other, we can assume that cooking lids with a size between 15 and 17 cm may have been used in combination with cooking pots, whereas those measuring between 20 and 22 cm were used to cover larger open forms.

Cumulatively, the dining and cooking wares reveal something of cooking patterns at the site in late antiquity. Compared with the late Republican deposits in Area III, closed forms suggestive of boiling/stewing, predominated over open forms for roasting/grilling. However, compared with other contemporary late antique sites in the project, like Pievina, the open forms were somewhat more common. These open forms correspond to a high percentage

Table 11.7 Tombarelle, Phase 3, EVE calculations for Area III ceramics, with project sites for comparison (EV).

Site	Total MNI for which EVE was calculated	Overall MNI	Mean EVE	Mode EVE	Median EVE
Tombarelle Phase 3	179 MNI (or 94.21% of the total MNI)	190 MNI	23.66%	25%	18%
Marzuolo Phase 3 Area I	112 MNI (or 70.44% of the total MNI)	159 MNI	26.16%	7%	15%
Marzuolo Phase 3 Area III	66 MNI (71.73% of the total MNI)	92 MNI	20.18%	7%	10%
San Martino	28 MNI (or 59.5% of the total MNI)	47 MNI	31.75%	7%	15%
Poggio dell'Amore	15 MNI (or 71.4% of the total MNI)	21 MNI	13.80%	7%	7%
Podere Terrato	36 MNI (or 58.06% of the total MNI)	62 MNI	17.94%	7%	10%

Table 11.8 Tombarelle, Phase 3, quality of the red coatings in the color-coated ware (EV).

Context	Total Color-coated Ware (MNI)	Non-sintered coating (MNI/%)	Semi-sintered or sintered coating (MNI/%)	Overfired (MNI/%)
17002	54	30 (55.55%)	17 (31.48%)	7 (12.96%)
17003	59	40 (67.79%)	12 (20.33%)	7 (11.86%)

of open-formed dining wares like plates and shallow bowls. Taken together, both cooking and dining wares may indicate a somewhat greater practice of roasting and frying and potentially the consumption of dry (as opposed to boiled or stewed) foods than at other contemporary sites. This agrees with the result of faunal analysis, which proposed a possible bias towards large cuts, but there are depositional reasons to be cautious about this connection (see below).

In addition to the presence of 14 MNI of overfired Color-coated ware (11.57% of the all 121 MNI), two fragmentary specimens, originally interpreted as small coarse ware vessels, have been now identified as two more kiln spacers (Fig. 11.46), reinforcing the idea of on-site ceramic production for the late Roman period.

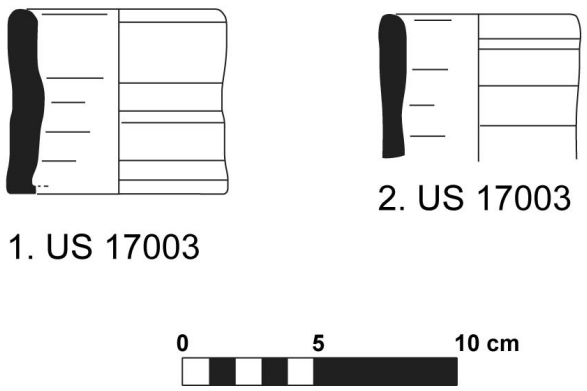


Fig. 11.46 Tombarelle, Area III, Phase 3, kiln spacers.

11.5.4 Phase 4 (Area I)

Medieval material was found only in Area I (Table 11.9, Fig. 11.47), in the abandonment levels of the cistern (SU 16021) and some materials from the trench outside the cistern (SU 16001). The sherd counts and MNI are low in each case; 3 MNI and 9 MNI, respectively. Considering the medieval material, only three ceramic classes (quite typical pattern for sites of the central centuries of the Middle Ages) are present: *acroma depurata* (7 MNI), Painted ware (1 MNI), and kitchen ware (4 MNI). Table 11.9 provides a breakdown of the medieval vessel forms documented in Area I and shows the very low (again typical) presence of open vessels in the repertoire of table/storage vessels with just 1 MNI (basin).

Table 11.9 Tombarelle, Phase 4, ceramic classes (EV).

FORMS	Tombarelle Phase 4 (12 MNI)
Jug (*Acroma depurata*)	5 MNI or 41.66%
Small amphora (*Acroma depurata*)	1 MNI or 8.33%
Basin (*Acroma depurata*)	1 MNI or 8.33%
Generic closed form (Painted ware)	1 MNI or 8.33%
Cooking pot (Kitchen ware)	2 MNI or 16.66%
Testo (Kitchen ware)	2 MNI or 16.66%

Despite the low quantities, functional analysis of these medieval wares finds patterns in keeping with other medieval sites in the area, namely an almost total absence of open vessels used for dining and/or storing food; the total dominance of vessels for containing liquid or semiliquid foods in the repertoire of table/storage forms; the total lack of cooking vessels for frying/roasting counterbalanced by the only presence of cooking pots used for boiling/stewing. All these patterns, discussed in greater detail in other contributions (Vaccaro 2011:203–228 and forthcoming[b]), are typical of the period between the 8th and 11th/12th c. AD.

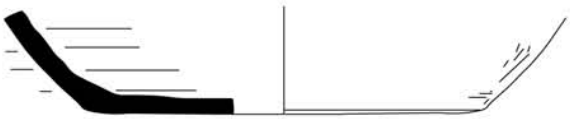
11.6 Faunal Materials (MM)

Quantities of faunal remains from Tombarelle were relatively robust, although inconsistent across phase/Area (Tables 11.10–11.13). Like the ceramics, the faunal materials are considered below by phase, in order to take into account the significant chronological and functional diversity.

Phase 1 (Area II)

Taphonomically, these remains display fairly uniform markings and conditions, specifically organic staining, root staining, and other indications of being preserved in a fairly humic, organic-rich matrix. Many pieces are rather large and conspicuously bulky. To appreciate differences, compare, for example, the average weight of a single NISP bone

Area I: *Acroma depurata* (AD), Red painted ware (RP) and Kitchen ware (KW)



1. AD_US 16021

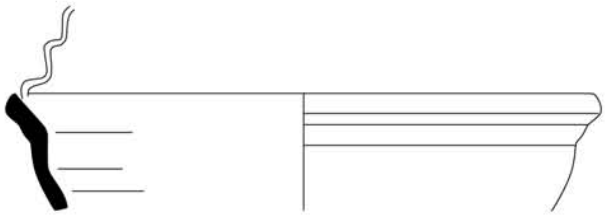
2. AD_US 16001

3. AD_US 16001

8. RP_US 16001

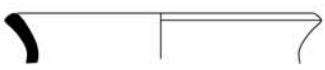
4. AD_US 16001

5. AD_US 16001



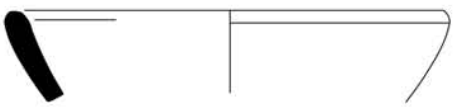
7. AD_US 16001

6. AD_US 16001



9. KW_US 16021

10. KW_US 16001



11. KW_US 16021

12. KW_US 16001

from Area II (ca. 50 g) vs. Area I (ca. 6 g) and Area III (ca. 24 g, the latter where another "dump" with large faunal pieces was excavated, see below). Preservation is good for most of these materials; it appears that the bulk was discarded and protected within what might be termed more "primary" depositional contexts, although the deposits that comprise these "dump" and "leveling" episodes also incorporate some "secondary" rubbish. Parallels between the ceramic and faunal evidence can be made, notably: (i) the presence of larger pieces, and (ii) a "hasty" depositional event (but with some peripheral trash); (iii) a balance among categories, that is the amount of bone rubbish is proportionately consistent with the ceramics. This is neither a markedly bone heavy nor ceramic heavy assemblage, the two sets parallel one another. In sum, while these deposits are not fully "pristine" dumps or fills, they contain at least a sizeable proportion of such remains to yield good clues for dietary and economic reconstructions.

Taxa proportions by NISP are 40% cattle, 30% deer, 10% wild boar, 10% sheep/goat, and 10% pig. These proportions are curious, especially when set within this time frame (i.e., 40–30 BC through Augustan). Larger pieces of adult cattle, deer, and wild boar comprise a significant amount of the faunal waste discarded in these contexts. The assemblage does contain pig and sheep/goat bones, but in fairly small quantities compared to the proportions for cattle and deer. Sheep dominate over goats (no goats were identified, but this need not imply their total absence), and one rather conspicuous sheep horn core is present amongst an assemblage largely comprised of postcranial elements.

About 20% of these bones display cut or chop marks, the bulk attributed to the disarticulation of joints and filleting of bigger chunks of meat from the bone. Patterns of spiral fracturing, coupled with a lack of any charring marks suggest boiling/stewing as principal cooking methods, but the sizeable proportion of large taxa (i.e., deer and cattle) would also supply fairly large filleted sections of meat, which might be cooked in various other ways (e.g., frying/roasting) and served in larger platters (cf. ceramics from this area). Obviously, smaller cuts of meat might also be cooked in a variety in a similar fashion, but as these (e.g., sheep/goat and pig) lack charring, they were predominantly cooked through stewing/boiling.

Although to some degree parts from across the entire cattle, pig, and deer skeleton are represented (which implies localized acquisition and consumption—as opposed to any import/export of meat cuts), an exception registers in the case of ribs, and especially vertebrae, which are practically absent. The impression here is that it is early waste from processing animals, with the better table scraps and cuts removed, a finding that could suggest some separation in processing activities with parts of animals moved to different consumers. This is difficult to confirm on the basis of current data. Overall, while all of these bones, regardless of taxon, are likely primary food waste, the larger, conspicuous size of a number of them, especially the cattle and deer bones, suggest that some materials were perhaps also chosen to assist in filling up the dump—that is, they represented bulk discard (much as was argued for Area III, although these deposits are not contemporary). Moreover, what might be deemed better-quality meat cuts, represented by rib and vertebral bones, are rare within this deposit. Also missing in this respect are younger lambs (although younger pigs are noted).

What might all this mean? The low frequency of bones typically associated with higher-quality meat coupled with the lower frequency of younger taxa within Area II could signify a lower-status diet, but this seems contrary to the fairly high frequency of deer and wild boar within the deposit—taxa that generally imply hunting, a purview of Roman elite. This is particularly true in the case of wild boar, represented by four isolated canine teeth, all from older adult males and all distinctly massive. Are these wild animals hunted for sport, or perhaps associated with opportunistic (poached?) wildlife to augment a meat-deprived, lower-status diet? I would argue the

Fig. 11.47 (*facing*) Tombarelle, Area I, Phase 4, representative diagnostic ceramics: *Acroma depurata* (AD), red painted ware (RP) and Kitchen ware (KW). 1. Small amphora (AD); 2–6. Jugs (AD); 7. Decorated basin (AD); 8. Generic closed form (RP); 9–10. Cooking pots (KW); 11–12. *Testi* (KW) (EV).

Table 11.10 Tombarelle, faunal remains, NISP and MNI values by temporal phase (MM).

	Tombarelle Phase 1 (Area II)			Tombarelle Phase 2 (Area IV)			Tombarelle Phase 3 (Area III)			Tombarelle Phase 4 (Area I)		
	NISP	MNI	Wt. (g)	NISP	MNI	Wt. (g)	NISP	MNI	Wt. (g)	NISP	MNI	Wt. (g)
Cattle (*Bos taurus*)	21	2 (2a)	1487	2	1 (a)	67	37	4 (1s,3a)	2926	2	1 (a)	33
Sheep/goat (*Ovis aries*/ *Capra hircus*)	7	2 (1s,1a)	164	5	1 (a)	9	16	3 (3a)	115	17	3 (3j)	94
Pig (*Sus scrofa* dom.)	8	2 (1s,1a)	97	—	—	—	27	7 (1j,2s,4a)	353	6	2 (2j)	8
Equid (*Equus* sp.)	—	—	—	—	—	—	3	1 (1a)	378	1	1 (a)	21
Dog (*Canis familiaris*)	1	1 (a)	4	—	—	—	4	1 (1a)	40	2	1 (a)	18
Domestic fowl (*Gallus gallus*)	—	—	—	—	—	—	2	1 (1a)	7	1	1 (a)	1
Red deer (*Cervus elaphus*)	17	2 (2a)	1000	—	—	—	—	—	—	1	1 (s)	19
Wild boar? (*Sus scrofa* fer.)	4	1 (a)	79	—	—	—	1	1 (1a)	124	—	—	—
Frog/toad	—	—	—	—	—	—	—	—	—	2	1	1
Water vole (*Arvicola terrestris*)	—	—	—	—	—	—	—	—	—	2	1	1
Tortoise (*Testudo* sp.)	1	1	2	—	—	—	—	—	—	—	—	—
TOTAL	**59**		**2833**	**7**		**76**	**90**		**3943**	**34**		**196**

a = adult; s = subadult; j = juvenile

former for this particular assemblage, but the latter is something that requires greater investigation across the wider Roman world.

Phase 2 (Area IV)

Area IV yielded a tiny assemblage of bones, scattered among SU 18001, 18009, and 18013. Although dated by association with the ceramics to the late Augustan–Tiberian period, these faunal remains are likely intrusive, secondary (and perhaps tertiary) in their incorporation within these deposits. They are quite scrappy, with extensive surface bleaching, erosion, carnivore gnawing, and root etching. That teeth and foot elements predominate enforces the likelihood that only the most durable skeletal pieces are represented. Because these contexts were subject to much bioturbation, they were of little value in demarcating any economic or dietary trends for the period, beyond mention that adult cattle and sheep/goat were present at that time. Similarly, Area IV also produced few ceramic finds, which themselves displayed marked taphonomic damage, so it would appear both ceramic and faunal remains within these contexts have undergone much post-depositional disturbance.

Phase 3 (Area III)

Remains derive nearly exclusively from SU 17002 and 17003, with a smaller amount from SU 17008. Both the homogeneous quality of the

Table 11.11 Tombarelle, faunal remains, UNID counts by temporal phase (MM).

	Count	Weight (g)	Count	Weight (g)	Count	Weight (g)	Count	Weight (g)
MAMMAL								
MEDIUM								
Rib	8	14	17	4	—	—	—	—
Long bone	27	61	2	12	41	198	3	3
Vertebrae	3	12	2	3	2	35	—	—
Scapula/Pelvis	2	18	—	—	2	5	—	—
Cranium	2	6	1	2	—	—	—	—
Other	5	8	—	—	—	—	—	—
LARGE								
Rib	18	200	—	—	26	353	—	—
Long bone	19	283	4	98	56	830	—	—
Vertebrae	4	86	2	27	3	267	—	—
Scapula/Pelvis	8	80	1	5	2	30	—	—
Cranium	6	80	—	—	—	—	—	—
Other	1	3	—	—	32	286	—	—
TOTAL	**103**	**851**	**29**	**151**	**164**	**2004**	**3**	**3**

stratigraphy and analysis of the ceramics (see above) point to a primary rubbish deposit that served principally to backfill two pre-existing holes. The faunal taphonomy supports this interpretation. An overview of Tables 11.10 and 11.11 shows a sizeable concentration of remains of cattle, which dominate NISP counts, and, assuming this taxon comprises the bulk of the "large" category for UNID counts, then that category as well. This deposit contains, not unlike the Phase 1/Area II deposits, larger, bulkier faunal pieces. The unit weight of each piece (combined NISP and UNID samples) is 23.3 g/piece, a figure well above that of other "rubbish dump" contexts among most of the sites excavated within the scope of the project (e.g., compare other 4th/5th c. AD contexts: (i) Pievina rubbish pit context SU 1006 = 15.9 g/piece; (ii) Casa Nuove late antique dump ca. 12.2 g/piece). This material from Area III is clearly rather conspicuous trash, but also trash that seems to have been deposited within a short interval and covered over rapidly. Carnivore gnawing registers minimally (less than 5% of bones); the bulk of the materials display fairly uniform taphonomic conditions, which include root staining, darker preservation conditions, and minimal post-depositional breakage. The ratio of isolated teeth to total NISP count is 0.15; while the ratio of isolated incisor teeth to total NISP count is 0.01. These are quite small. Comparable figures among the two sites listed above (and indeed across most contexts throughout the project) are generally higher than this, in turn implying those deposits were subjected to greater taphonomic shuffling, destruction, breakage, and other factors that can fragment, erode and otherwise destroy faunal remains. The sum result of these data suggests quick deposition and burial for these materials within a fairly organically rich, and relatively protected matrix. Furthermore, the presence of heavy calcareous/concrete encrustations on a number of the bones denotes that not just faunal waste (and ceramics) was deposited within this context, but also perhaps "raw" construction/industrial debris. Overall, available evidence points to an infill episode done in relative haste in which larger, chunkier, bulkier materials were chosen for infill.

Table 11.12 Tombarelle, NISP and MNE frequency of skeletal part categories for cattle, sheep/goat and pig (MM).

		Cattle					Sheep/Goat					Pig				
		n	1°	2°	ext.	head	n	1°	2°	ext.	head	n	1°	2°	ext.	head
Tombarelle Phase 1 (Area II)	NISP	21	19	4.8	33.3	42.9	7	—	57.1	28.6	14.3	8	12.5	12.5	25	50
	MNE	4	25	25	25	25	3	—	33.3	33.3	33.3	4	25	25	25	25
Tombarelle Phase 2 (Area IV)	NISP	2	—	—	50	50	5	—	—	—	100	—	—	—	—	—
	MNE	2	—	—	50	50	1	—	—	—	100	—	—	—	—	—
Tombarelle Phase 3 (Area III)	NISP	37	27	10.8	8.1	54.1	16	—	6.3	—	93.8	27	—	—	—	100
	MNE	9	22.2	22.2	11.1	44.4	4	—	25	—	75	2	—	—	—	100
Tombarelle Phase 4 (Area I)	NISP	2	—	—	—	100	17	29.4	41.2	29.4	—	6	83.3	16.7	—	—
	MNE	1	—	—	—	100	7	28.6	42.9	28.6	—	4	50	—	25	25

1° = primary cut (includes scapula, humerus, pelvis, femur)
2° = secondary cut (includes radius, ulna, tibia, fibula)
ext. = limb extremities (includes metapodials, carpals, tarsals, phalanges)
head = cranium, mandible, all teeth

Table 11.13 Tombarelle, % NISP and MNI for cattle, sheep/goat and pig (MM).

	Tombarelle Phase 1 (Area II)		Tombarelle Phase 2 (Area IV)		Tombarelle Phase 3 (Area III)		Tombarelle Phase 4 (Area I)	
	NISP (n=36)	MNI (n=6)	NISP (n=73	MNI (n=2)	NISP (n=80)	MNI (n=14)	NISP (n=25)	MNI (n=6)
Cattle (*Bos taurus*)	58.3	33.3	28.6	50	46.3	28.6	8	16.7
Sheep/goat (*Ovis aries/ Capra hircus*)	19.4	33.3	71.4	50	20	21.4	68	50
Pig (*Sus scrofa* dom.)	22.2	33.3	—	—	33.8	50	24	33.3

Tombarelle diverges from the other two late antique sites in the project in the higher frequency of cattle. Is this a factor of the nature of the deposit in Area III, or a reflection of a higher incidence of beef in the diet for this particular site? The former is more likely. The site lacks a wider concentration on sheep/goat pastoralism, a phenomenon that intensifies throughout Italy as whole into late antiquity which should be mirrored at Tombarelle, but not within this particular deposit. Similarly, age schemes within the various taxa conform to typical patterns for traction, rather than dietary meat: the cattle within this deposit are chiefly adults (75%), with one subadult (25%) indicating use of these cattle for work purposes, as opposed to dietary veal. For other species, age patterns likewise fit within regional norms: sheep/goat are represented by adults (100%, and with a 2:1 ratio of sheep/goat), while adult and subadult pigs are both included with a balance between males and females (Table 11.10). Metric data for animal sizes also conform among sites. Overall, the regionally and chronologically normative patterns for non-cattle species point against a specialized dietary-economic scheme and suggest that cattle from this deposit were chosen

because they represent large, big pieces of faunal waste for rapid backfilling. The deposit in Area III is not typical of a representative sample of household meat waste.

Domestic fowl and wild boar register in this deposit but are inconsequential overall, similar to other late antique deposits. The equid and dog remains from this deposit were not consumed. The dog is represented by a fragment of a limb bone (humerus) and a portion of a mandible, both of which suggest an adult, medium/large sized individual, typical among representatives across other sites. The equid bones recovered consist of a small portion of a femur, a second phalanx bone, and a fragment of a metacarpal. Size estimates suggest the latter derive from a donkey, and rather curiously these equid elements are the only mammalian bone within the entire assemblage to show traces of sun-bleaching. This observation need not contradict the quick deposition of this assemblage, but suggests that these few equid elements, as secondary rubbish, were probably collected alongside a few other scraps of other waste in filling this deposit.

Little can be concluded about sheep/goat and pig butchery and consumption from the deposit in Area III, while somewhat more can be deduced from the cattle (Table 11.12). For sheep/goat and pigs, dental elements overwhelmingly dominate the assemblage; even UNID counts are fairly sparse, with no ribs and crania represented, and very few vertebrae. The impression is that the better-quality cuts from these taxa are interred elsewhere, presumably alongside midden waste that related to generalized household consumption. For cattle, all parts of the skeleton are represented within the assemblage, both cranial and postcranial parts (although the lower feet and horns are missing), representing carcass butchery and processing waste, and largely from ribs, long bones, and jaws. These elements are butchered, predominantly with larger cleavers, a number of which have left traces in disarticulating and deboning various cattle meat cuts. A direct connection with cooking operations is always difficult to make on the basis of faunal data alone, especially given that meat stripped off the bone can be rendered invisible in the archaeological and faunal record. Nonetheless, two methods might be argued in this case. First, the higher concentration of cattle (and beef), coupled with the manner of disarticulation and meat filleting shown in the butchery data suggest that processing larger cuts of meat (as can be more easily extracted from a cattle carcass, e.g., thicker, bigger cuts of steak, etc.) can be associated with this particular assemblage. Alternatively, it seems reasonable also to suggest that cooking of meat by stewing/boiling was also practiced. This manner seems to predominate across many other sites in the Roman Peasant Project and was probably a central means with which to cook meat at the household level.

Phase 4/Area I

Recovered from SU 16021 were scattered postcranial remains of at least two, very juvenile sheep/goat (each probably less than one month of age), as well as a smaller collection of postcranial bones from at least two, again very juvenile (perhaps even fetal/newborn) pigs. None of these remains showed any traces of butchery, so linking them directly with food rubbish is not secure. Their presence in the cistern may represent some type of accident, wherein very young pigs and sheep/goat fell into (were thrown into?) the cistern, or they may denote the disposal of unwanted, perhaps stillborn, or sickly animals. In any event, their presence does fix the area (or its close vicinity) as a location where birthing of sheep/goat and pigs occurred, which in turn lends support to the argument that localized production (and presumably consumption) of stock predominated during this medieval phase. Moreover, given the close age range between these pigs and sheep/goat represented (i.e., each at, or less than, one month of age), it would appear that livestock birthing schemes overlapped to some degree, or were set on a more casual cycle to coincide.

11.7 Hydrological/Geological Contexts, Land Units, and Land Evaluation (AA)

The area around Tombarelle is a good illustration of the differences between the various geo-thematic maps of different scales and mapped with different criteria. The 25K land units analysis of this area utilized geo-lithological maps at 100K, geological maps at 10K and also yielded a highly detailed lithological

map of the excavation trenches (see below). Working at these different scales revealed the area's unusually finely grained variation, even within the seeming homogeneity of the same lithological family.

The hill on which Tombarelle sits is, according to the 1:10,000 geological maps of the CARG project of the Regione Toscana,[3] occupied by upper Miocene sands. Visual inspection of the underlying geology during excavation exposed a more diversified setting (Fig. 11.48).

Areas I and II: In the northern part of the section, on the bottom of one of the trenches the contact between reddish fine-textured layers and pebbly layers were exposed, following a direction of about 290° WNW. It is not clear if this a vertical contact or a sub-horizontal overlap. It is probable, but not certain, that this contact continues at least partly to the cistern as both formations come very close to the western extremity of the structure. It is possible that an original upwelling of water here inspired the construction of the cistern. As the structure was not completely excavated, it is not known if it contained pipes or other means to permit groundwater to enter (see above).

Area III: The nearby road cut, as well as the excavations themselves permitted examination of the surrounding geology. In the E part of the trench, the geological substrate is composed of reddish-brown, iron-mottled, loamy clay, whereas along the S and W portion grey, loamy, fine sand is exposed. These were also visible in the road cut to the W of the Area. The substrate layers crop out also, over a length of about 30 m.

Area III is centered on another intersection between clay and sandy levels. This may shed some light on the function of the pit (SU 17005), as it lies in only part of the hill where fine clayey deposits were found. It is also possible it could have held groundwater flow, as the intersection of layers may well have caused such upwellings.

Indeed, like the nearby Podere Terrato, the area around Tombarelle is rich in natural groundwater upwellings. According to the 1:10,000 geological maps, the hill itself is composed of upper Miocene yellow sands, while in the direct surroundings, we find loamy clays and sand and pebble banks. Figure 11.49 shows the location of all the *fontoni* or natural ground water pools overlain on the 10K geological map.[4] It is evident that the *fontoni* are concentrated within the realm of the Tertiary formations and absent from both the older and on the younger Quaternary formations. Four *fontoni* are present in the area directly around Tombarelle. These important groundwater sources seem at least partly related to

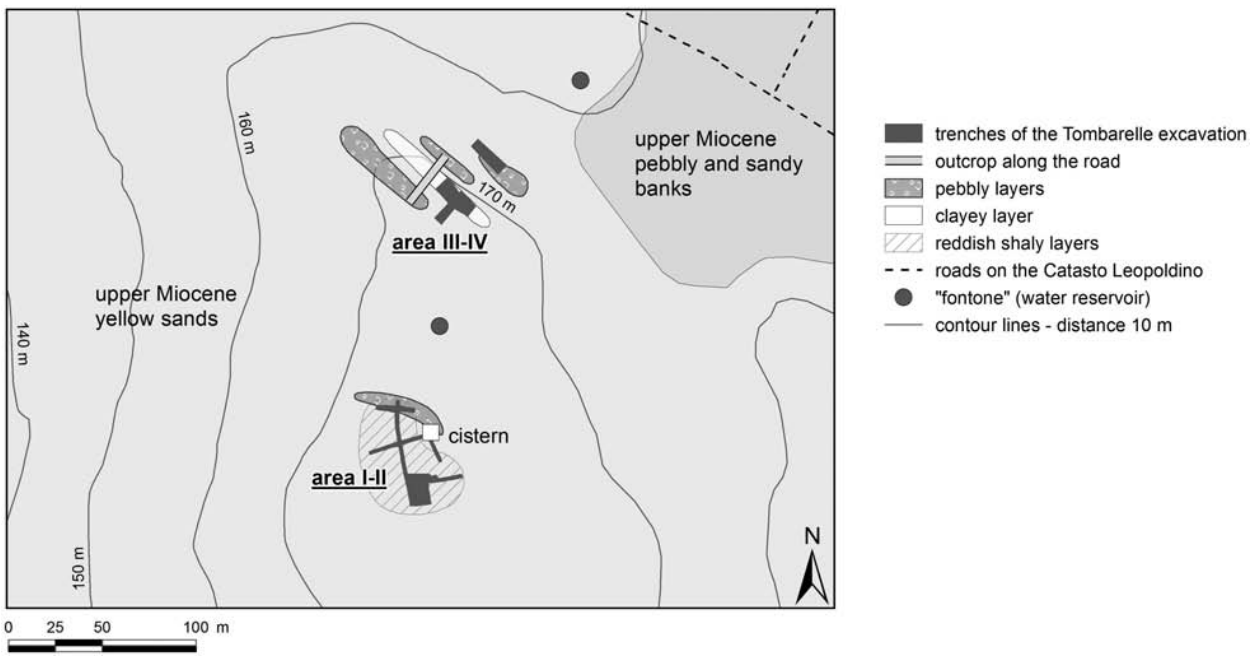


Fig. 11.48 Tombarelle, geological map of site (AA).

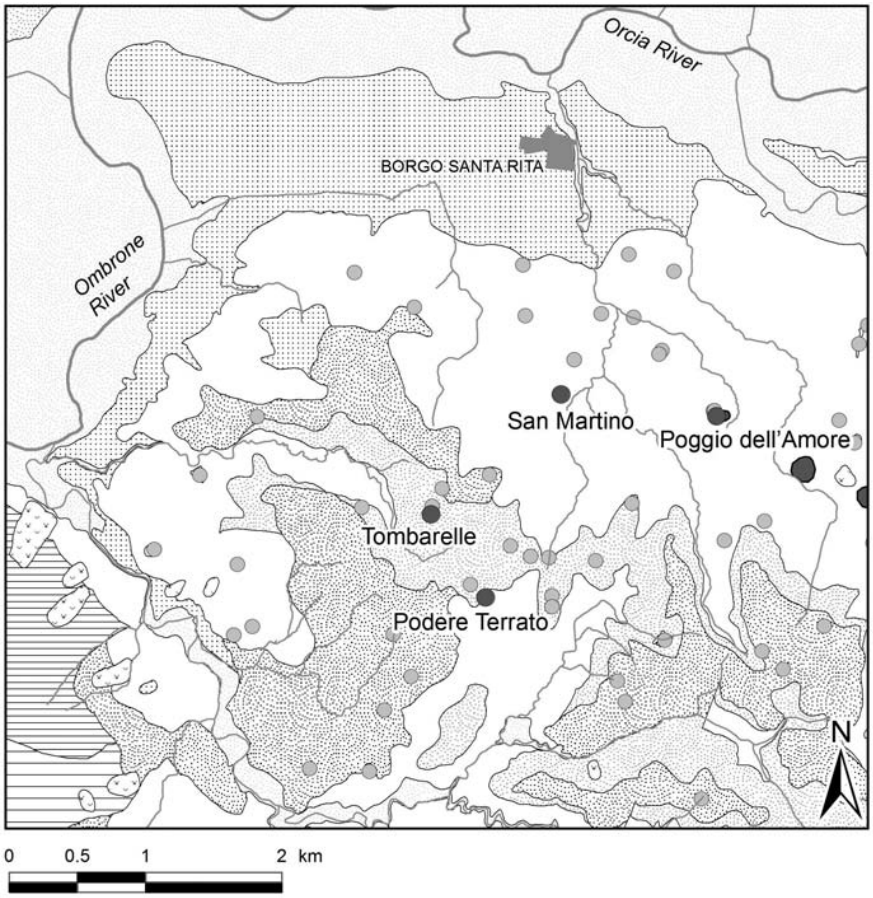


Fig. 11.49 Tombarelle, map of locale showing geological and hydrological features, including *fontoni* (AA).

differentiated water movements within the geological layers.

The land units and derived land evaluation maps for this area are virtually the same as that estimated for nearby Podere Terrato (see Figs. 9.13 and 9.14) and describe a relatively homogeneous area dominated by clay loamy and fine sandy Tertiary formations. These areas were rated as highly suitable for agricultural use due to their high natural fertility (Fig. 11.50, hypothesis I). Bands of somewhat better land are found just to the south in the lower areas around the Fosso Merdancione Infernaccio. But the whole area should be rated as moderately suitable if we consider that the clayey texture makes the soils rather difficult to plow with low-technology agriculture (Fig. 11.51, hypothesis II).

11.8 Botanical Materials (AAM, AF, ER, RR)

A total of 19 pollen samples and 15 macroremain samples were collected and treated (Tables 11.14–11.16). Of the pollen samples, 7 were selected for treatment—three from Area II where they were taken from SU 19007, 19011, and 19014 (see Fig. 11.10), and four from Area III, where they were taken from the fill (SU 17002) and natural geology (17005) of the pit and the fill (17003) and natural geology (SU 17004) of the paved area (see Fig. 11.15). Of the 15 macroremain samples taken, only Area II (SU 19003, 19007, 19008, 19011) yielded any remains, while SU 17024, 18002, 18003 yielded some isolated examples.

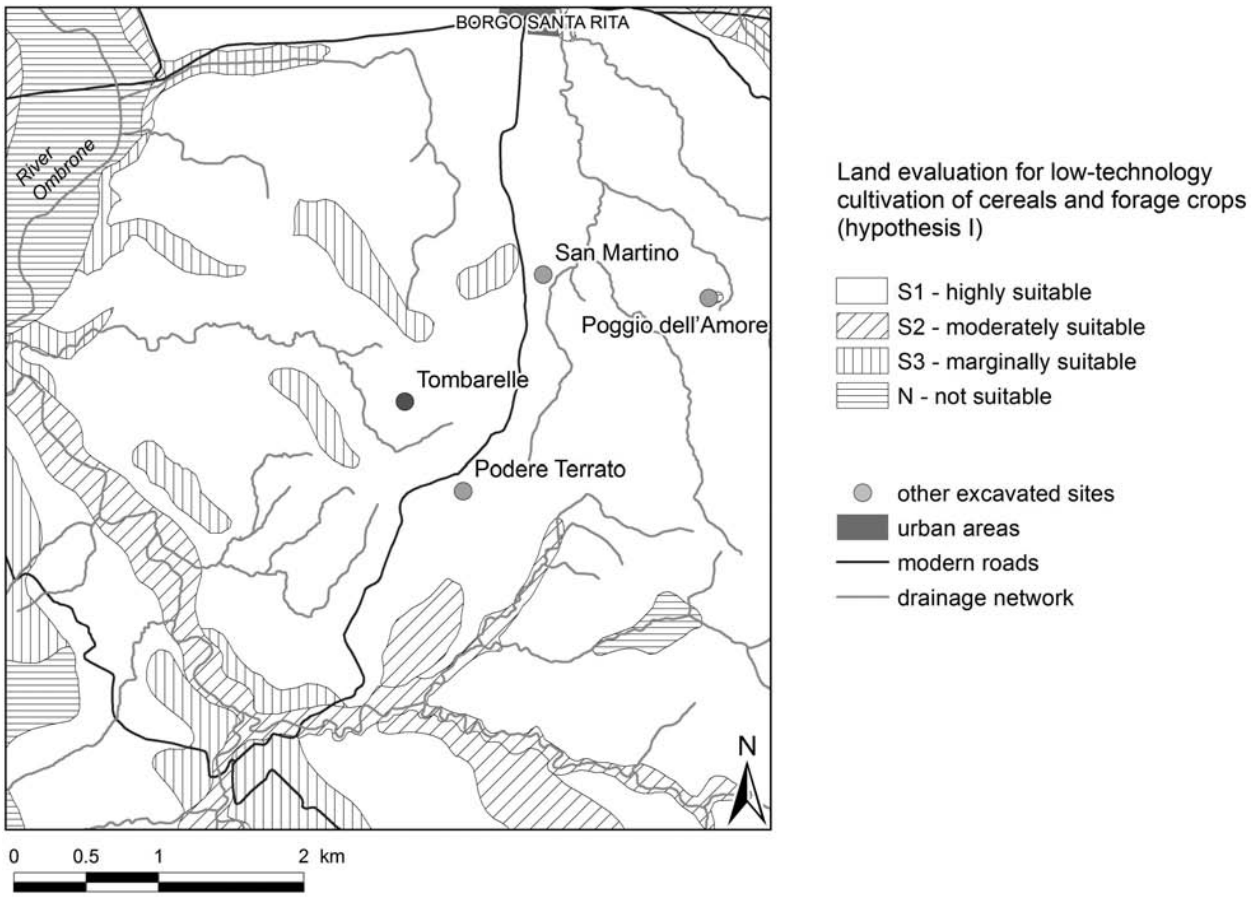


Fig. 11.50 Tombarelle, land evaluation map, hypothesis I (AA).

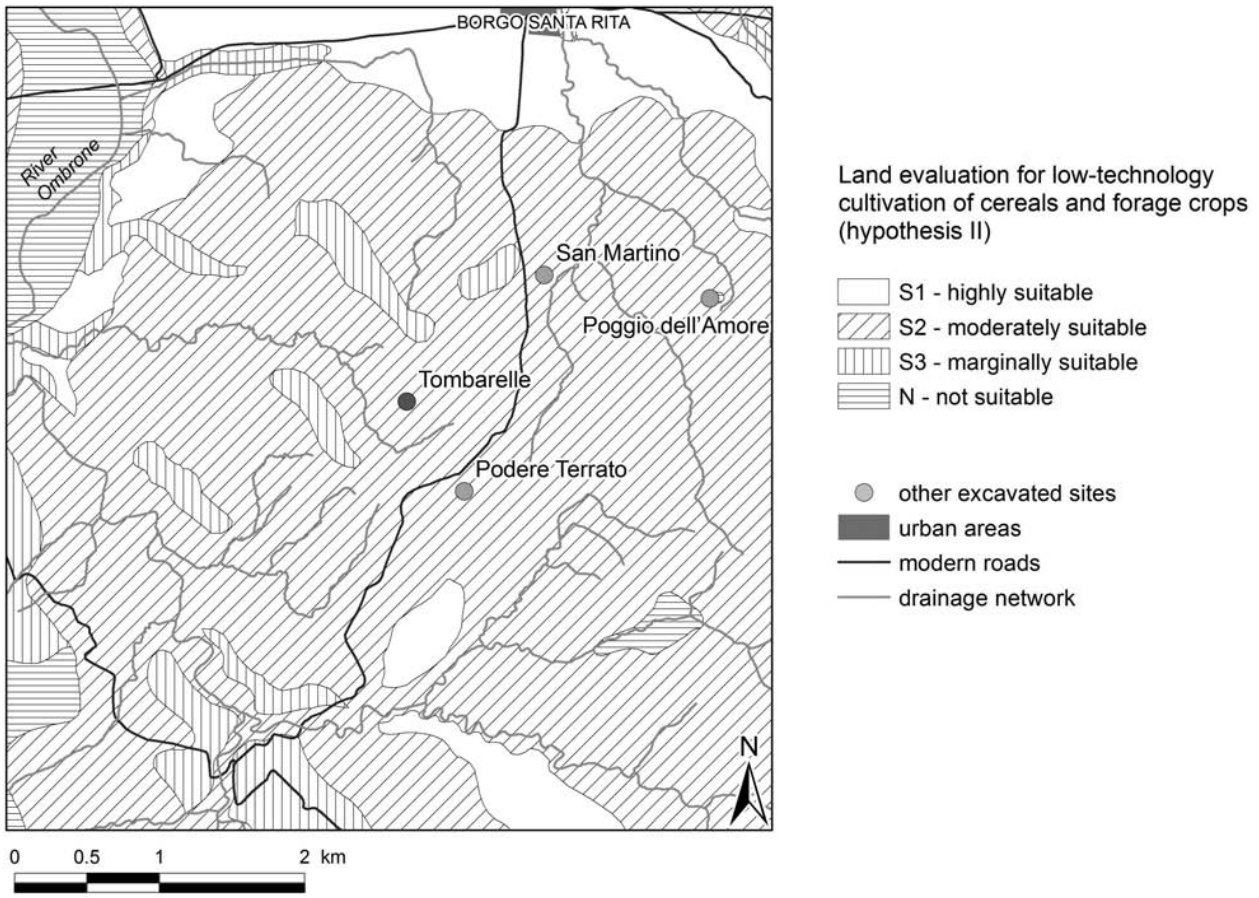


Fig. 11.51 Tombarelle, land evaluation map, hypothesis II (AA).

It is important to note at the outset the taphonomic property of the pollen samples, all of which are taken from dumps. It is important to ascertain that these dumps did not include major deposits of materials from completely different chronological contexts as part of the "refilling" act. All the other taphonomic data cited above suggests this was not the case: the total absence of residual ceramics in any of the dumps and the various indications from ceramics and faunal materials that the dumps were composed of a single episode all point to contemporary material only entering both the Area II and III dumps. The almost total absence of modern pollen dominated by olive pollen (derived from the adjacent olive grove) likewise indicates that the samples are free from modern pollution. While the dumps may not have been "polluted" by anachronous materials, they may have depositional properties different from other kinds of contexts. Rather than areas simply left open to pollen rains, they may have seen the concentrated dumping of particular plant materials—just as we have seen in the selection of particular types of ceramics. As will become apparent below, the Area II dump probably included such deliberate depositions.

A total of 2,292 pollen grains (327/sample), a good quantity of NPPs (28,377 NPP/g) but no microcharcoals, and 25 seeds/fruits were counted (Table 11.14). Concentrations of pollen were generally high (38,224 p/g on average), in particular in samples from the fills of dumps (from 152,300 p/g in P2/SU 19007 to 37,500 p/g in P15/SU 17003, and 32,400 p/g in P10/SU 17002). This suggests some plant accumulation in the relevant layers, corresponding to waste disposal. Not surprisingly P12, a geological context (SU 17005) had very low concentrations (<2,000 p/g). Preservation was good and only two reworked pollen grains, indications of possible re-deposition, were found.

Landscape and woodland composition: Pollen diversity was reasonably high, with 21 to 44 taxa per sample, suggesting a relatively natural landscape in

Table 11.14 Tombarelle, pollen analysis (AMM/AF).

TOMBARELLE Percentage pollen spectra												
Sample (TB)			***P2***	***P4***	***P7***	***P10***	***P12***	***P15***	***P18***	***Mean per phase/ area***		
Area			Area II/Phase 1			Area III/Phase 3				***Area II Phase 1***	***Area III Phase 3***	***Mean pollen spectrum***
Stratigraphic Unit			19007	19011	19014	17002	17005 (cut)	17003	17004 (cut)			
Depth - cm			21	35	50	15	25	35	12			
Pollen concentration (p/g)			**152327**	**30851**	**8972**	**32369**	**1573**	**37489**	**4058**	**64050**	**18872**	**38234**
ANACARDIACEAE	*Pistacia*	Md		0.3						0.1		0.04
BETULACEAE	*Alnus*	Wt				0.4					0.1	0.1
	Carpinus betulus	Ow				0.2		0.6	0.8		0.4	0.2
	Corylus	Ow				0.6		0.6	0.4		0.4	0.2
	Ostrya /Carpinus orientalis	Ow							0.4		0.1	0.1
ERICACEAE	*Erica arborea* cf.	Md		0.3						0.1		0.04
FAGACEAE	*Quercus deciduous*	Ow	1.8	2.8	3.9	7.5	11.1	3.6	7.6	2.8	7.4	5.5
OLEACEAE	*Fraxinus*	Ow			0.2	0.6			1.3	0.1	0.5	0.3
	Olea europaea	Md						1.5			0.4	0.2
	Oleaceae indiff.				0.2			0.6		0.1	0.2	0.1
PINACEAE	*Pinus*		0.3	0.6	1.4	2.8		3.2	16.9	0.8	5.7	3.6
ROSACEAE	*Prunus*			0.6		0.6		0.2	0.4	0.2	0.3	0.3
SALICACEAE	*Salix*	Wt	0.3							0.1		0.04
ULMACEAE	*Ulmus*	Ow							0.8		0.2	0.1
AMARANTHACEAE	*Beta* type							0.2			0.1	0.03
	Chenopodium		0.9		0.5	0.2		1.3	0.8	0.4	0.6	0.5
	Chenopodiaceae indiff.			1.3	0.2	0.2		0.6	0.8	0.5	0.4	0.5
APIACEAE	Apiaceae indiff.		0.6	1.6	0.2			0.2	0.4	0.8	0.2	0.4
	Orlaya								0.4		0.1	0.1
ASTERACEAE	*Artemisia*		0.6	0.6	0.9	1.1		0.6	0.4	0.7	0.5	0.6
	Aster type	LPPI	1.5	1.9	1.2	2.3		0.2	3.0	1.5	1.4	1.4
	Asteroideae indiff.	LPPI			0.7	2.1		1.9		0.2	1.0	0.7
	Centaurea nigra type	LPPI	4.1	4.4	1.8	1.9		0.8	1.7	3.4	1.1	2.1
	Cichorieae	LPPI	14.4	27.0	34.2	8.5		40.3	13.1	25.2	15.5	19.6
	Carduus	LPPI	0.3							0.1		0.04
BORAGINACEAE	Boraginaceae							0.4			0.1	0.1
BRASSICACEAE	*Brassica* type					0.4		3.2			0.9	0.5
	Brassicaceae indiff.		0.6		0.5	1.1		3.2	3.4	0.3	1.9	1.2
	Hornungia type			0.9		1.3		0.2	0.8	0.3	0.6	0.5
CARYOPHYLLACEAE	Caryophyllaceae *indiff.*		2.1	2.2	0.9	2.3		1.1	0.8	1.7	1.1	1.3
	Silene dioica type					0.2					0.1	0.03
CONVOLVULACEAE	*Convolvulus*							0.2			0.1	0.03
CYPERACEAE	Cyperaceae indiff.	(Wh)	3.8	4.4	12.0	10.2		1.3	5.5	6.7	4.3	5.3
	Scirpus	(Wh)			0.7	0.4				0.2	0.1	0.2

Table 11.14 cont'd Tombarelle, pollen analysis (AMM/AF).

TOMBARELLE Percentage pollen spectra												
Sample (TB)			***P2***	***P4***	***P7***	***P10***	***P12***	***P15***	***P18***	***Mean per phase/ area***		
Area			Area II/Phase 1			Area III/Phase 3				***Area II Phase 1***	***Area III Phase 3***	***Mean pollen spectrum***
Stratigraphic Unit			19007	19011	19014	17002	17005 (cut)	17003	17004 (cut)			
Depth - cm			21	35	50	15	25	35	12			
Pollen concentration (p/g)			**152327**	**30851**	**8972**	**32369**	**1573**	**37489**	**4058**	**64050**	**18872**	**38234**
DIPSACACEAE	*Dipsacus* cf.					0.2					0.1	0.03
EUPHORBIACEAE	*Euphorbia*				0.2					0.1		0.03
FABACEAE	*Astragalus*	le				0.2		0.4			0.2	0.1
	Fabaceae indiff.	le	0.6	1.6	1.2	1.3		1.5	0.8	1.1	0.9	1.0
	Lotus	le				0.2		0.6			0.2	0.1
	Trifolium type	le		1.3	0.5	0.2	5.6	1.5	0.8	0.6	2.0	1.4
	Trifolium pratense cf.	le				0.6		0.4			0.3	0.2
GERANIACEAE	Geraniaceae				0.2					0.1		0.03
LAMIACEAE	Lamiaceae indiff.				0.2	1.5				0.1	0.4	0.2
	Mentha type		0.3		0.2	1.9	5.6		2.1	0.2	2.4	1.4
	Stachys					0.6					0.2	0.1
LILIACEAE	Liliaceae				0.2	0.2		0.4		0.1	0.2	0.1
PLANTAGINACEAE	*Linaria* type					0.2					0.1	0.03
	Plantago		3.5	3.8	0.7	2.3		3.6	0.4	2.7	1.6	2.0
POACEAE	*Avena/Triticum* group	ce	29.6	10.3	11.1	3.2	5.6	4.2	3.8	17.0	4.2	9.7
	Hordeum group	ce				0.4		0.4			0.2	0.1
	Phragmites australis cf.	Wh				0.2					0.1	0.03
	Poaceae-wild group		32.8	28.2	17.8	20.0	33.3	12.6	18.2	26.3	21.1	23.3
POLYGONACEAE	*Persicaria maculosa* type							0.4			0.1	0.1
RANUNCULACEAE	*Ranunculus* type	LPPI			0.7	8.3		0.4	0.8	0.2	2.4	1.5
	Ranunculaceae indiff.	LPPI	1.5		2.8	8.3		2.9	6.4	1.4	4.4	3.1
ROSACEAE	*Rosaceae*			0.9	1.4	1.5	5.6	0.8		0.8	2.0	1.5
SCROPHULARIACEAE	*Scrophularia* type					0.2					0.1	0.03
	Scrophulariaceae indiff.		0.3	0.3	0.5	0.4		0.2		0.4	0.2	0.2
	Verbascum cf.			0.3					0.4	0.1	0.1	0.1
URTICACEAE	*Urtica dioica* type		0.3		0.2	0.2				0.2	0.1	0.1
Unknown/Indet.				4.4	2.5	2.3	33.3	3.6	5.9	2.3	11.3	7.4
POLLEN SUM			**341**	**319**	**433**	**469**	**18**	**476**	**236**	**364**	**300**	**327**
NUMBER OF TAXA			**21**	**23**	**31**	**44**	**6**	**39**	**29**			
SUMS												
Arboreal pollen		**AP**	**2.3**	**4.7**	**5.8**	**12.8**	**11.1**	**10.3**	**28.8**	**4.3**	**15.8**	**10.8**
Non Arboreal pollen		**NAP**	**96.8**	**94.1**	**93.5**	**86.8**	**88.9**	**87.6**	**69.5**	**94.8**	**83.2**	**88.2**
Mixed oak wood		**Ow**	**1.8**	**2.8**	**4.2**	**9.0**	**11.1**	**4.8**	**11.4**	**2.9**	**9.1**	**6.4**

Table 11.14 cont'd Tombarelle, pollen analysis (AMM/AF).

TOMBARELLE Percentage pollen spectra											
Sample (TB)		***P2***	***P4***	***P7***	***P10***	***P12***	***P15***	***P18***	***Mean per phase/ area***		
Area		Area II/Phase 1			Area III/Phase 3						
Stratigraphic Unit		19007	19011	19014	17002	17005 (cut)	17003	17004 (cut)	***Area II Phase 1***	***Area III Phase 3***	***Mean pollen spectrum***
Depth - cm		21	35	50	15	25	35	12			
Pollen concentration (p/g)		**152327**	**30851**	**8972**	**32369**	**1573**	**37489**	**4058**	**64050**	**18872**	**38234**
Mediterranean trees/ shrubs	**Md**		**0.6**				**1.5**		**0.2**	**0.4**	**0.3**
Wet environments (trees)	Wt	0.3			0.4				0.1	0.1	0.1
Wet environments (herbs)	Wh				0.2					0.1	0.03
Wet environments (Cyperaceae)	(Wh)	3.8	4.4	12.7	10.7		1.3	5.5	7.0	4.4	5.5
Wet environments	**WE**	**4.1**	**4.4**	**12.7**	**11.3**		**1.3**	**5.5**	**7.1**	**4.5**	**5.6**
Cerealia	**ce**	**29.6**	**10.3**	**11.1**	**3.6**	**5.6**	**4.6**	**3.8**	**17.0**	**4.4**	**9.8**
Legumes/pulses (- fodder)	**le**	**0.6**	**2.8**	**1.6**	**2.6**	**5.6**	**4.4**	**1.7**	**1.7**	**3.6**	**2.7**
LPPI (- Cich)		7.3	6.3	7.2	23.0		6.3	11.9	6.9	10.3	8.9
LPPI	**LPPI**	**21.7**	**33.2**	**41.3**	**31.6**		**46.6**	**25.0**	**32.1**	**25.8**	**28.5**

Table 11.15 Tombarelle, non-pollen palynomorph analysis (AMM/AF).

TOMBARELLE Non-Pollen Palynomorphs								
Sample (TB)		***P2***	***P4***	***P7***	***P10***	***P12***	***P15***	***P18***
Area		Area II/Phase 1			Area III/Phase 3			
Stratigraphic Unit		19007	19011	19014	17002	17005 (not arch)	17003	17004 (not arch)
Depth - cm		21	35	50	15	25	35	12
NON-POLLEN PALYNOMORPHS (concentration NPP/g)								
FUNGI	*Glomus* (incl. *G. fascicolatum*), *Ascospora* – HdV18, *Coniochaeta*, *Coniochaeta lignaria* – HdV172, *Delitschia* type, *Diplocladiella* type, *Sordaria* type, *Sporormiella*, *Scleroderma*, *Tilletia*, *Tricodelitschia*, *Pleospora*, *Urocystis*, Fungal spores undiff.	22701	11995	3695	2785	0	123495	78
ALGAE	*Pseudoschizaea*, *Spirogyra*, HdV181, HdV182, HdV984	14782	4719	528	348	1452	10291	39
ZOOMICROREMAINS	*Dicrocoelium*, Fragments of invertebrates undiff.	1056	197	264	174	0	0	39
Total Concentration of classified NPPs (NPP/g)		**38539**	**16912**	**4487**	**3307**	**1452**	**133786**	**156**

Table 11.16 Tombarelle, macroremains analysis (AMM/RR).

TOMBARELLE Macroremains								
Sample (TB)		***M1***	***M2***	***M3***	***M4***	***M5***	***M6***	***M7***
Stratigraphic Unit		**17024**	**18002**	**18003**	**19003**	**19007**	**19008**	**19011**
Sediment volume (liters)		15	25	25	25	25	25	25
Chronology		Phase 3	Phase 2	Phase 2	Phase 1	Phase 1	Phase 1	Phase 1
Olea europaea L.	endocarp				1	8	1	1
Fruit trees					**1**	**8**	**1**	**1**
Triticum sp.	caryopsis						2	1
Grains and legumes							**2**	**1**
Persicaria maculosa (L.) Gray	achene		6	3				
Ruderals s.l.			**6**	**3**				
Carex sp.	achene	2						
Wet Environments		**2**						
TOTAL		**2**	**6**	**3**	**1**	**8**	**3**	**2**

which human intervention did not markedly reduce species diversity. Arboreal/Non-Arboreal pollen ratio (AP/NAP) differed somewhat by phase: 4/96 in Area II/late 1st c. BC and 17/83 in Area III/early 5th c. AD. However, rather than evidence of reforestation, this difference may be a product of the formation of these dumps, particularly, as will be shown below, the preferential deposition of grain in the Area II/1st c. BC dump. What can be ascertained from both these numbers and the low AP/NAP ratios in the "natural" samples (P12/SU 17005 and 18/SU 17004) is that forest cover was indeed low, potentially some of the lowest in the project area. Despite the low percentages of woodland pollen, some 14 taxa of prevalently tree/shrub plant taxa were identified suggesting that the composition of woods was fairly diversified. As was the case in other project sites, *Quercus* was dominant (5.5% on average); followed by *Pinus* (3.6%), with the occasional presence of some fruit trees (*Prunus* and *Corylus* 0.3 and 0.2%, respectively). Mediterranean vegetation is sparse (0.3%) and represented by low values of *Pistacia*, *Erica arborea* cf., and *Olea europaea*. Hygrophilous woods are infrequent, represented by *Alnus* and *Salix* at less than 0.1%.

Wet environments: While wetland plants were present in significant numbers (5.6%), most of these derived from sedges (Cyperaceae) and indicate the spread of wet pastures. Plants and trees indicating aquatic environments like the above mentioned hygrophilous trees, and hygrophytes *Scirpus* (0.2%), and *Phragmites australis* cf. (<0.1%) are very low, indicating that surface water lay far from the site.

It is worth noting the many groundwater upwellings (*fontoni*) located in the geological survey (see above) around Tombarelle. The cistern in Area I, adjacent to Area II, would also have provided an important source of standing water. These sources are not, however, reflected in the botanical profile.

Cereal fields: Cereals are mainly represented by the *Avena/Triticum* group (10%) suggesting that wheat rather than other cereals were mainly cultivated in the fields. This high number is largely a product of the Area II/1st c. BC dumps (average 17%) and considerably lower (4.4% average) in the late antique Area III deposits. These contexts also contain weeds such as *Artemisia*, *Centaurea nigra* type, Convolvulaceae, *Persicaria maculosa* type, and *Silene dioica* type, which are indications of crop processing. Overall, these data suggest that during the late 1st c. BC the locale was dedicated to the cultivation of cereals which were then deliberately transported to the site, probably for plant processing. The only contrary indication is the low quantity of cereal macroremains in these same deposits, which may be due to the poor macroremain preservation throughout the site.

Cultivated woody plants: Among woody plants, cultivated taxa are represented by traces of olive trees. *Olea* pollen has been found only in one sample

(1.5% in P15, Area III/early 5th c. AD), so we must hypothesize that groves were grown fairly far from the site. Thanks to this low presence, we can also exclude the pollution of the studied archaeological deposits by modern pollen rain, whose composition is dominated by *Olea*. Other species produce edible fruits possibly collected in the wild. Hazelnuts (*Corylus*) and *Prunus*, a genus belonging to the Rosaceae family that includes wild and cultivated species producing edible fruits, were present in low quantities in both Areas/periods. Moreover, also acorns could have been gathered from the oaks.

Pastures and Fodder: Local Pastoral Pollen Indicators (LPPI) are lower at Tombarelle than the other project sites (28.5% on average, 32.1% from the Area II and 25.8% in Area III) corresponding to relatively fewer plants strictly correlated to local pastoral activities (e.g., Cichorieae, Asteroideae, and Ranunculaceae). Significant species include Cichorieae (20% on average) together with Poaceae-wild grass group (23.3%), and somewhat less Brassicaceae (2%) and Chenopodiaceae (1%). Other taxa provide secondary indicators of grazed pasture: *Plantago* (2%), common in trampled areas, and *Urtica* (0.1%), spread in nitrophilous environments. In addition, *Orlaya* (0.1%) is an anthropogenic pollen indicator that could be linked to pastoral/breeding activities. The presence of Fabaceae in all samples (including, e.g., *Astragalus, Lotus* and *Trifolium* 3%) points to the legume-fodder cultivation.

Non-Pollen Palynomorphs

Spores and hyphas of fungi, spores and other elements of algae and zoomicroremains were found in all samples in very good quantities (Table 11.15); all the identified non-pollen biological remains are 28,377 on average.

Fungi (12 morphotypes plus some undifferentiated spores) amounted to ca. 23,536 NPP/g on average. In all samples, *Sporormiella* and *Sordaria* type are prevalent; they are coprophilous fungi that live on dung and markers of presence of excrements, probably of animals, Other fungi are present in almost all samples, such as *Glomus*; this mycorrhizal fungus (growing on roots of both herbs and trees) is indicative of soil erosion; important is the presence of *Tilletia* that is a pathogenic fungus that was found in some samples (P2, 4, 10, 18), which can be a parasitic fungi for cereals.

Algae (5 morphotypes) concentration is 4,594 NPP/g on average. Almost all samples contain HdV181, algae that marks the presence of shallow waters; *Pseudoschizaea*, found in all samples from Area II, is a common and easily recognizable algae cyst that may reflect anthropogenic soil erosion or presence of fresh water.

Zoomicroremains were observed in almost all pollen samples and included parts of small animals and some invertebrate organisms, always in very small quantities. Two parasite eggs of *Dicrocoelium* were found in samples P10 and P18: *Dicrocoelium* includes the species *D. dendriticum* (salmon tapeworm), a parasite of ruminants (Le Bailly et al. 2010).

Microcharcoals

Only a few microcharcoals of very small size have been observed (<50 microns) thus suggesting that evidence for local fires was absent/not preserved (Table 11.15).

Macroremains

Very few seeds and fruits were preserved in the deposit (Table 11.16); in general, the remains are charred and show poor preservation. The total number of remains is very low (25 records in 360 liters)—all suggesting the preservation issues have skewed macroremain presence at the site.

Of this poor sample, a few items merit notice. Three *Triticum* sp. caryopses were found in SU 19008 and 19011. Given the high presence of cereal pollen, however, it is strange that other cereal remains are absent. The recovery of charred endocarps of *Olea europaea* (about 10, from Area II/SU 19003, 19007, 19008, 19011) is ambiguous; on the top of the hill where Area II is located the current landowners are accustomed to burn the residues of pruning of olive groves; charred fruits, leaves and branches of olive trees currently cover the margins of the excavation area. It should be recalled that SU 19003 was also found to contain modern materials. It is possible, even likely, that these olive endocarps derive from modern depositions. It is hard to explain, however, the absence of *Olea* pollen in the deposit (mentioned above), which given the adjacent modern olive grove, would be another indicator of modern pollution.

In general, the macrobotanical record was too scanty to obtain useful information.

11.9 Coins/Small Finds/Glass (SCE)

Metal finds from Tombarelle were characterized by the typical background scatter of nails, slag, and unidentifiable fragments of copper alloy and iron that was present at Pievina, Case Nuove, and Marzuolo. Standing out from this background is a potential copper alloy vessel rim fragment that consists of a copper alloy lamina folded over on one side and slightly curving, which might be part of the rim of the vessel (SF 319002).

Small finds of interest from Tombarelle are few, non-metal, and chronologically disparate. A set of chert biface tools ("hand-axes" and scrapers), SF 519001 from SU 19001, and SF 519019, 519022, 519024 from SU 19011 are likely the earliest artifacts recovered by the project (Fig. 11.52). The date of these lithic instruments could range from the Paleolithic to the Late Bronze Age, and, while their function speaks to a variety of activities such as hide scraping, their presence is suggestive of a local campsite in the area that long predated the Republican occupation of Tombarelle. The absence of lithic debitage and cores would suggest that the site was not the locus of lithic production, but no firm conclusions should be drawn given the redeposition of these tools in subsequent historical layers.

From Area III came two more unusual finds. First is a set of two joining fragments of a mold for the manufacture of male infant terracotta heads as an *ex voto* offering (SF 517009), which were found in the late antique fill SU 17002 (Fig. 11.53). The extant mold is only for the front part of the head and neck of the infant; it is impossible to say if the terracotta votive was to be impressed onto a two-dimensional relief or whether there was an additional mold for the rear part of the head. Both styles of reliefs are common in Etruscan and Roman sanctuaries. The style of the terracotta mold would be consonant broadly with a Hellenistic/Republican attribution, possibly ca. 3rd–1st c. BC, but, given that the find is outside of its likely use context, it could perhaps extend into the imperial period.

Second, also from the 5th c. AD Area III dumps, came a *tegula* roof tile with a stamp in Etruscan, SF 517014 (Figs. 11.54–11.55). The text of the stamp has been discussed elsewhere (Collins-Elliott and Bowes 2016). The inscription of the stamp is sinistrograde, reading *σp. lχ. ciart*, referring to a manufacturer by the name of *Lauχmes Ciarti* who produced tiles for public use, as the abbreviation *σp*(*ural*) attests. Letterforms correspond with Maggiani's Type II Alphabet for Northern Etruria and favor a second century BC or first century BC date at the latest. The incidence of *i* for *e* in the orthography of the name of *Ciarti*, as well as the use of *t* for *θ*, could potentially be taken as an indication of Latin influence, and would strengthen a later dating. Members of the *gens Ciartia*

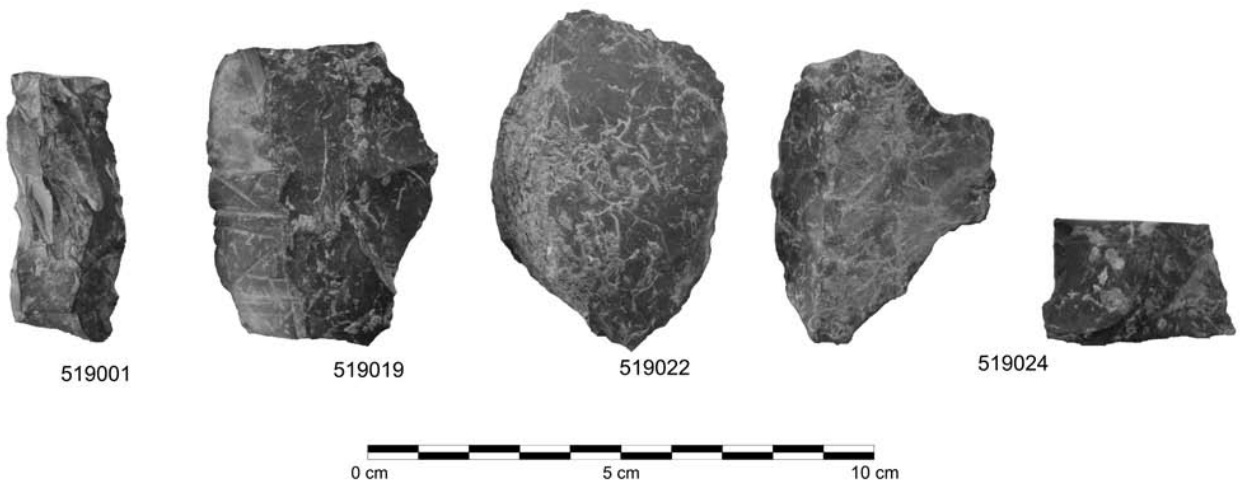


Fig. 11.52 Tombarelle, (L to R) SF 519001, 519019, 519022, 519024, stone scrapers, all from Area II Phase 2 (SCE).

Fig. 11.53 Tombarelle, SF 517009, photo of two joining fragments of ceramic mold of male head, for manufacture of miniature terracotta sculptures, and cast of same (SCE).

are attested also at Perugia and Arezzo, as well as at Rome into the high empire (Chioffi 1989–1990). Aside from the other named individuals to come the project study zone at Marzuolo (the potters Sext(il)ius, Rufrenus, Manneius, Umbricius, the tilemaker Verecundus), Lauχmes Ciarti effectively stands as the one of the few individuals whose name we know of who inhabited the area around Cinigiano. Public stamps are known from many other urban and religious contexts throughout Italy (Mingazzini 1970; Manacorda 2002), and, closer to Cinigano, in the hinterlands of Populonia and Volterra, such public stamps are linked to sanctuaries (Maggiani 1978, 1990). It is not possible speculate further at this point on which polity the stamp refers to, but the nature and degree of state-sponsored or sanctioned building projects in the region during the Republican period can perhaps be better defined with further evidence, such as is forthcoming from excavations of the Roman sanctuary at Podere Cannici in the *comune* of Civitella Paganico (Sebastiani 2018).

Glass finds included only four unidentified fragments of body shards from Phase 3 (SF 417001, 417002, 417004, 417005), while only a single coin (SF 217013)—an illegible bronze issue perhaps of the 4th or 5th c. AD—was recovered from the Area III dumps.

11.10 Building Materials (AA)

Area I: Cistern: The stones of the cistern walls exposed at the surface could only be partially recognized, due to a thin calcareous crust covering most examples and/or their small size (Fig. 11.56). Calcarenitic/marly stones were dominant, with travertines present more occasionally. Three pieces of hard reddish conglomerate were identified.

Area III: In the walls of the paved area, calcarenites/marls were dominant (Fig. 11.57). A single small travertine stone and a few reddish hard conglomerate stones were identified. Standing out were a large, shaped, fine-grained sandstone with angular grains, and a single volcanic stone.

The calcarenitic/marly stones can be sourced to any accessible outcrop of the "argilloscisti"/flysch formations or to the riverbeds at their feet (Fig. 11.58). The travertine must have been brought here from the nearby small outcrops between Poggio dell'Amore

Fig. 11.54 Tombarelle, SF 517014, large fragment of tile with stamp in Etruscan (SCE).

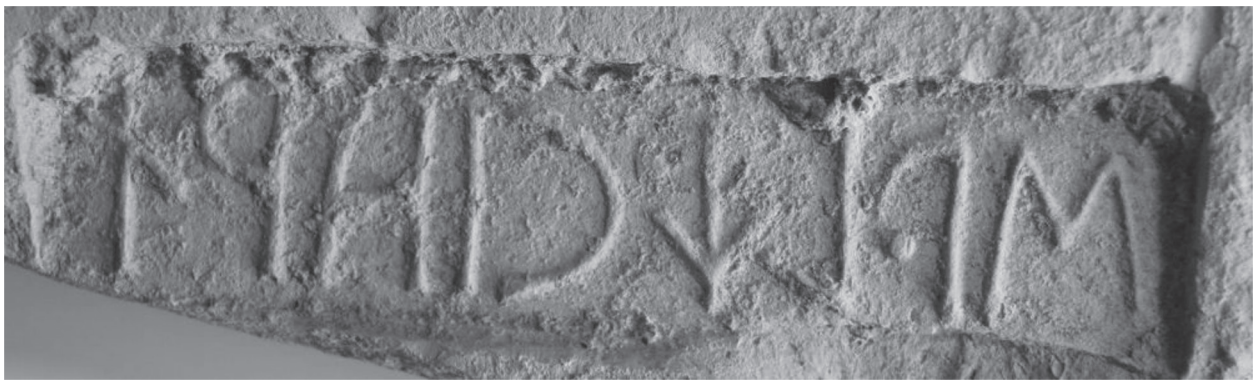


Fig. 11.55 Tombarelle, SF 517014, detail of stamp (SCE).

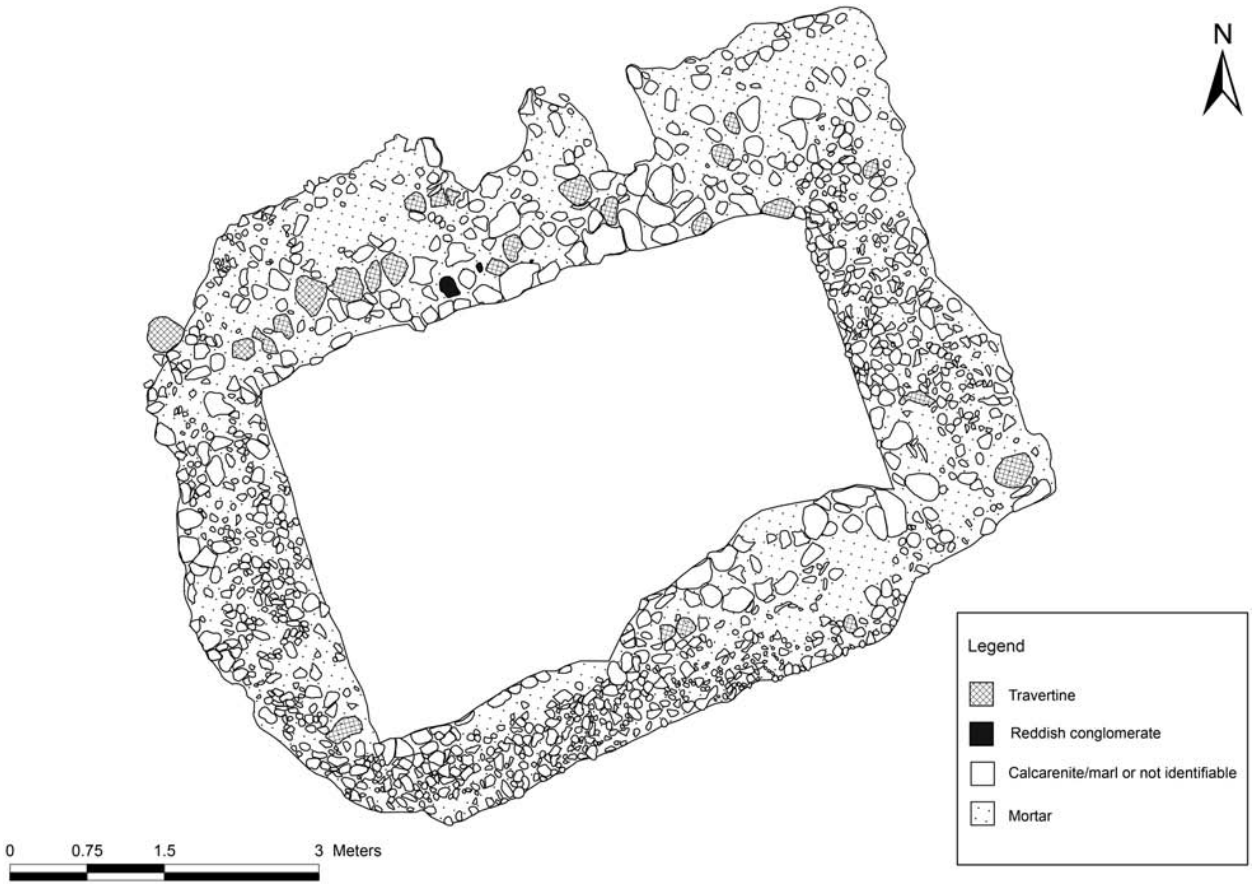


Fig. 11.56 Tombarelle, Area I, plan of cistern (SU 16002) showing different building stones (ER/MS).

and Falsettaio, while the single volcanic stone comes from Monte Amiata. As noted elsewhere, the most probable origin of the hard red conglomerates and sandstones is Montenero. Thus, each structure contains stones that come from sources ranging from 3 to 15 km away.

11.11 Discussion (KB)

The four spaces excavated on the Tombarelle hillside reveal a sequence of discontinuous and non-overlapping human interventions. The earliest occupation took place on the top of the hill in the range of 40 through 10 BC with a series of cuts and dumps. The cistern, whose date could not be determined but lay adjacent to this area, may have been built at this time. By the mid-Augustan period, this area was abandoned and occupation had moved down slope, where an area at the base of the hill accumulated wash and ceramic debris dating from ca. 0–40 AD. Our excavations revealed no mid-imperial occupation. Occupation reappears in late antiquity with the excavation and infill of the round pit and the construction and subsequent infill of the paved area.

What was Tombarelle? What functions did these migrating series of installations serve? Aside from the cistern and the walls surrounding the paved area, the excavations revealed only negative elements—cuts, pits, and dumps—and determination of the areas' varying functions is heavily reliant on the finds. In the mid-1st c. BC Area II, the fill of the large cut contains some ceramic wasters, indicating nearby coarse ware production. The discovery of an unusually large percentage of grain pollen indicates a local investment in grain production above the norms for the region, while conversely, faunal finds point to hunting—typically an elite activity. The roof tile found in the 5th c. AD dump with its Etruscan stamp with the abbreviation śp for śpural (of the

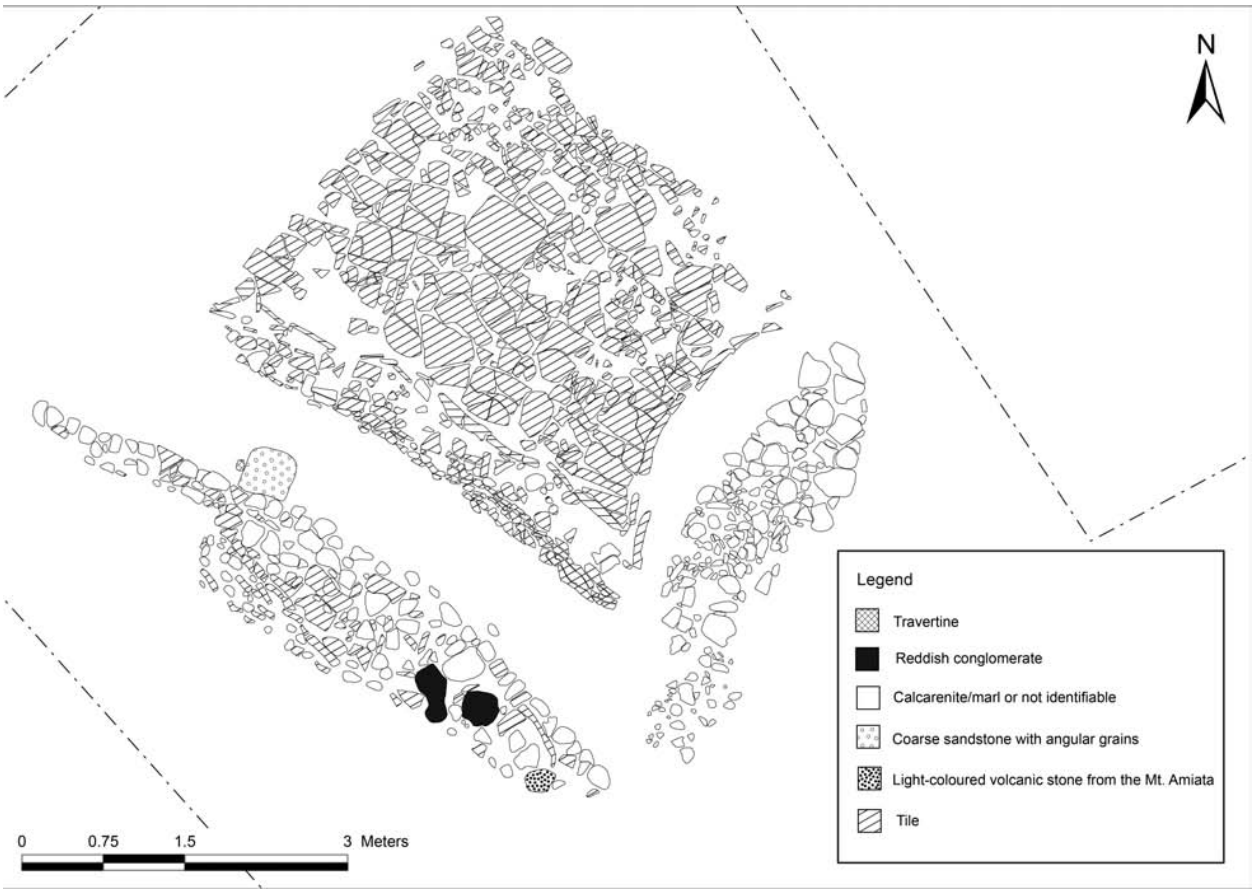
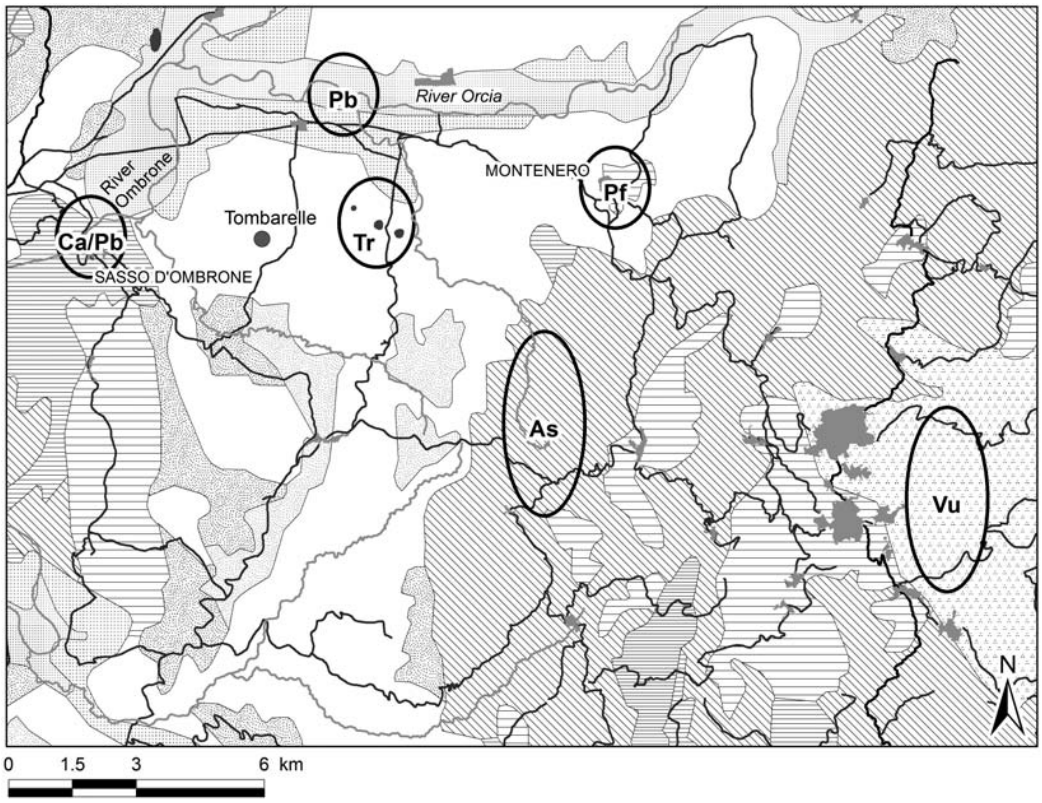


Fig. 11.57 Tombarelle, Area III, plan of walls of paved area, showing different building stones (ER/MS).

city) should date from this early moment of the site's occupation. It would seem to indicate either connection to or the emplacement of a collective governing entity. The cistern, should it also date to this period, indicates significant water needs and its organized collection. Taken together, all these indicators point to Tombarelle as a kind of "central place" in the locale, displaying agricultural, land management, and ceramic production capabilities distinct from other sites excavated by the project except, perhaps Marzuolo. What kind of central place we cannot say: these kind of activities could be found in a farm, a ceramic production facility, an agglomerated settlement, or a combination of these functions. Traditional functional definitions of Roman Italian sites seem particularly unhelpful here.

The continued evolution of the site in the 1st c. AD is less clear as the evidence from Area IV is limited. Judging from the wasters and possible kiln spacers, coarse ware and tile ceramic manufacturing continued in the 1st c. AD, seemingly in an area upslope from the accumulated debris found in Area IV.

Like Pievina and Case Nuove, occupation jumps over a mid-imperial hiatus and re-commences in late antiquity. The sparse ceramic finds from beneath the paved area may indicate a 4th c. date for these interventions, or they may cluster closer to the mid-5th c. AD. In any case, this period sees the excavation of a pit and construction of a paved area bounded by terrace walls but left seemingly unroofed and open to the air. What function did this new area serve? Again, the evidence is ambiguous. Excavation for clay in this clay-rich portion of the hill is a possible rationale for the pit, while the paved area could have served as a space to dry pots prior to firing. The presence of Color-coated ware wasters and two kiln spacers in the dumps over these spaces also points to ceramic production on site. The absence of kilns is naturally problematic. In any event, both areas were deliberately and quickly backfilled in the mid-5th c. AD with



Lithology

- marls and limestone (pre-Miocene)
- marly shales (pre-Miocene)
- metamorphic schists (pre-Miocene)
- carbonatic schists (pre-Miocene)
- sandstone - "Macigno" (Lower Miocene)
- sands (Upper Miocene)
- clays (Upper Miocene, Pliocene)
- conglomerates (Pliocene)
- acid vulcanites of the Monte Amiata (Pleistocene)
- river terraces (Pleistocene)
- alluvial deposits (Holocene)
- travertine (Lower Pleistocene)

building stones sources / nearest outcrops

Ca/Pb - limestones and marly limestones from the Ombrone outcrop and river
Pb - river pebbles and cobbles
Pf - conglomerates and sandstones ("Pietraforte" formation)
Tr - travertine formation
As - siliceous limestones
Vu - ignimbrites of the Mt. Amiata

- urban areas
- modern roads
- main rivers

Fig. 11.58 Tombarelle, map showing nearest outcrops of building stones (AA).

deliberately selected large tile, ceramic, and faunal waste of contemporary date. These infills were seemingly done to flatten this portion of the hillside for other use.

Missing in the narrative of these excavated portions of Tombarelle are the all-critical unexcavated areas, in particular, the large, multiperiod scatter to the W (TU 412 and 413). These large mid-slope scatters, with a range of Roman, late antique, and medieval materials, were left unexcavated due to the difficulties of obtaining permits from multiple proprietors. In retrospect TU 412 was the best candidate for the actual "center" of the site: its dense scatter morphology (5–15/m^2), large size, and mid-slope location make it more viable than the large, but very dispersed, tile-dominated scatters at the hill's base. If TU 412 were the nucleus of the site, the excavated Areas I–IV may be interpreted as satellites around it, the cuts, dumps, cistern, pits, and pavement functional apparatus, mostly short-lived, that served the changing, specific functional needs of the inhabitants of the nucleus. What might such a nucleus represent? Several of the morphological-functional categories known to Roman archaeologists are candidates—a farm with various outbuildings, like Pievina but on a larger scale, an agglomerated settlement in which the nucleus was formed by small habitations, the productive nucleus of a ceramics production site, or some mix of these.

New work in both central Italy and the northern provinces provide some comparative material for the oddities of Tombarelle's morphology, but just as importantly indicate how "normal" such category-defying sites can be. In Lazio, independent irrigation cisterns dot the countryside, suggesting they need not, as has been assumed, form part of a farm or villa (Quilici and Quilici Gigli 2009). Similarly, the few peasant farmsteads excavated there and in Tuscany have associated rubbish-filled cuts and pits, the pits themselves are thought to be sites of clay extraction (Jones 1963:147–158; Gadd 1986:113–114; Barbieri 2005b). In Languedoc, a series of enigmatic excavated pits lined with stone or tile have been identified as drinking troughs for animals (Cayn et al. 2017), while concentrated areas of cuts and fills, pits, and other negative features dot the landscape of Roman Britain and northern France (Allen and Smith 2016; Lebrun et al. 2017). Coase ware production sites have seen less excavation,

Whether farm, village, or other form of rural settlement, the material culture of Tombarelle indicates that it left a heavy imprint on its locale. The higher investment in grain production during its early phase accompanied by very low forestation, the seemingly *longue durée* ceramic and tile production, and the cistern's indication of water collection and management, all point to a site that intensively impacted its environment on and off for a half a millennium. In this context, the absence of certain kinds of material culture, glass, coins and metal objects, is particularly strange, although this may be a factor of having excavated the satellite sites rather than the core.

NOTES:

11.1 The only excavated context that was not processed in detail is the topsoil SU 17001 (with 47 fragments), as it was superficial and mostly characterized by wall fragments.

11.2 A single join was also found between dump SU 17003 and the tiled floor 17011, seemingly an intrusion from the above dump to the floor below.

11.3 Sections 320010 & 320050, downloadable from http://www502.regione.toscana.it/geoscopio/cartoteca.html; complete legend at http://gisnetwork.provincia.ms.it/Vari/Geologia/ Legenda_geo_UNISI.pdf

11.4 Data from 10,000:1 topographical maps of the Regione Toscana, the red and green false color aerial photographs of 2012 available through WMS from the site. http://www502.regione.toscana.it/carto-grafia/wms-raster/com.rt.wms.RTmap/wms?map=wmsofc& https://www.regione.toscana.it/-/ricerca-e-consultazione-foto-aeree, and on field observations.

University Museum Monograph 154

The Roman Peasant Project 2009–2014

Excavating the Roman Rural Poor

Volume 2

Edited by
Kim Bowes

University of Pennsylvania Museum of Archaeology and Anthropology | Philadelphia

Publication of this book was aided by a grant from
the von Bothmer Publication Fund of
the Archaeological Institute of America.

LIBRARY OF CONGRESS CATALOGING-IN-PUBLICATION DATA
Appears in Volume 1

ISBN-13: 978-1-949057-07-2

© 2020 by the University of Pennsylvania Museum of Archaeology and Anthropology
Philadelphia, PA
All rights reserved. Published 2020

Distributed for the University of Pennsylvania Museum of Archaeology and Anthropology
by the University of Pennsylvania Press.

Printed in the United States of America on acid-free paper.

Part II

A New Synthesis

12

Where Did Roman Peasants Live?

Habitation and Distributed Habitation

Kim Bowes, Stephen Collins-Elliott, and Cam Grey

Peter Garnsey's (1979) seminal article asked one of the basic questions this project has attempted to answer: where did Roman peasants live? In 1979, both the textual and the archaeological data were slim, and Garnsey relied on ethnographic comparisons of northern and southern Italian peasants—as well as the few excavated sites—to propose a bipartite model. Northern Roman peasants, he suggested, lived in single-family, dispersed homes/farms in the countryside, while southern Italian peasants lived in villages and commuted to their farms.

Garnsey's elegant model was inspiring not only for its integration of ethnographic, archaeological, and historical data, but also for the hope it inspired that lacunose data on Roman peasants might be ameliorated by modern comparanda. Its insistence that Italian Roman peasants might not be a single category but, instead, a more regionally diverse group, was a welcome breath of heterogeneity over the homogeneous monolith presumed to be the everywhere-present Roman peasant. What Garnsey lacked, of course, was data: only a handful of peasant sites from the South Etruria Survey had been excavated and published at that time, none of the big surveys had been fully published, while the large-scale excavations of peasant farms outside Italy, in the Netherlands, France, and Britain, were still decades away.

The Roman Peasant Project attempted to answer Garnsey's original question both as its first goal and as a prerequisite to tackling its other questions about lifeways and the role of rural dwellers in Roman social history. Drawing on the big datasets the project generated while adopting a more cautious approach to ethnographic data, it suggests new answers to this question. In brief, the project data indicates that Roman peasants in our study area, and perhaps elsewhere, did not always "live" in a single house or village in the way Garnsey imagined. Instead, their practice of dwelling in this landscape entailed spending a varying amount of time in a variety of places in their locale, moving, with a range of periodicities, from more permanently occupied "houses" to seasonal production sites to work huts used a few hours or days per year. The term we have used to describe this multitude of peasant spaces is "distributed habitation."

12.1 Definitions: House and Households (KB, CG)

While much ink has been spilled about Roman houses and households in Italy (Wallace-Hadrill 1994; 1996; Allison 1997, 2004; Ellis 2000; Hales 2003) most of these studies offer no working definition of a "house." In most cases, this may be attributed to the fact that these studies address elite, urban houses and no definition seems necessary—one knows it when one sees

it. Anthropologically inflected studies, instead, tend to take as their point of departure the human unit—the household. This unit tends to be regarded as economically co-operative and to involve, primarily, co-resident, commensal kin. Each of these criteria might be challenged and, at any rate, none are easily recoverable from the archaeological record. The house in this anthropological definition is the space created by the activities of household members (Wilk and Rathje 1982; Blanton 1994; Hodder 1990). House and household are, thereby, imagined to coexist as an iterative matrix of space and human activity in which the latter plays the formative role. The activities that define the household and, thus, their house-space, are various and occur in different combinations at different times. Wilk and Rathje's (1982) now-canonical, very general list of these activities—production, distribution, transmission and reproduction—encompass an enormous range of actions that may both be contained by and exceed the boundaries of Roman households.

This anthropological framework has certain advantages, most especially the broad categories that it provides for interpreting actions that can be posited on the basis of archaeological evidence. Nonetheless, it also envisions the house as secondary to the activities it houses, a product of both social norms and individual agency pushing against those norms (Rapoport 1969; Bourdieu 1977; cf. Thomas 2008). Much of the recent work on houses defines them as spaces of long-term cultural memory, iterative sites of culture formation and cognitive mapping where social rules are codified and naturalized. Whether they be the houses of Roman elites with their careful structuration of sight lines and construction of ancestral memory (Flower 1996; Hales 2003), or Neolithic houses that bring together the living and the dead (Hodder 1990; Beck 2007), we have come to define houses—and households—by their repetitive, long-term memory, and culture-producing qualities.

12.2 Peasant Houses and Households in Roman Central Italy (KB)

While the cultural-architectural form of elite Roman households in central Italy has been widely studied (Wallace-Hadrill 1994; Allison 2004), far less is known about the houses and households of non-elites. In urban contexts, the principal space of non-elites is assumed to be the insula apartment (Storey 2001, 2002, 2004), as well as rooms behind and above shops (Holleran 2012). In the countryside, non-elites are presumed to live in small houses and/or farms. Prior to this project, only about a dozen examples of such spaces had been excavated and published and only a single short survey attempted to analyze them. As a consequence, our knowledge base of both peasant houses and household activities has been limited.[1] However, while small in quantity, this corpus of excavated peasant houses describes a discrete, recognizable material culture, marked by a similarly discrete and recognizable spectrum of size and material complexity.

The basic site consists of a rectangular building, undivided, typically at least 10 m long: sites like Podere Tartuchino Phase 1, Grosseto (Perkins and Attolini 1987), Monte Forco, Rome (Jones 1963); Poggio Grillo, Siena (Barbieri 2003, 2005b, 2008–9); Monte Bono, Pistoia (Pasquinucci 2008–2012; Pasquinucci et al. 2007–2008; Pasquinucci et al. 2012); and Campo La Noce, Rome (Di Matteo 2005) (see Figs. 12.1–12.4), exemplify this basic type.[2] The walls are usually composed of dry stone socles, laid directly in the local earth, with mud and small stones as binder atop which are pisé walls and typically a tile roof. A porch or lean-to provides an interior/exterior extension of the house, while a beaten earth yard or courtyard forms the exterior workspace. Main doors, when they are preserved, are wide, presumably to admit animals or carts. Mortar is only rarely used, except in tanks for wine/oil pressing, while floors are typically of beaten earth. A hearth appears inside, or occasionally outside the structure, while dolia for rainwater collection, wine making, or other purposes are commonly found around the building's flanks. Large pits are often found at some distance from the building, originally perhaps used for the quarrying of clay for pisé but later used for off-site rubbish disposal.

What we might term "activity spaces" are lightly but consistently materially signaled in these basic sites: while there is rarely a subdivision of rooms for different production facilities, cooking areas, water storage, and intermediary interior/exterior spaces are all given material expression as presses, hearths, dolia, and porches. Also significant is the span of generational time: the majority of these sites are occupied for two centuries or more, showing multiple

phases of alterations to the building fabric, room additions, and floor changes. Later phases are often marked by the subdivision of the original spaces or the use of post-built structures to support and extend or replace masonry structures.

A second, more complex version of the above peasant house sees the subdivision of the long rectangular space and/or addition of multiple rooms, one or more of which may have an installation for agro-processing. The sites at Podere Tartuchino Phase 2, Grosseto (Perkins and Attolini 1987); Podere Cosciano, Pisa (Camin and McCall 2003–04; Camin 2004–05; Aranguren et al. 2007); and Podere S. Mario, Volterra (Motta, Camin, and Terrenato 1993; Motta 1997; Camin 2014) serve as examples (Figs. 12.5–12.9). A rudimentary spatial separation of activities within the major structure marks these sites. A preparatory terrace or leveling up layer, cut stone for the corners, more extensive use of mortar beyond agro-processing facilities, and/or a possible upper story may also be found in these more complex sites.

Finally, the third and most complex version is distinguished both by additional spatial separation of activities into distinct rooms or zones, and by the addition of specialized installations for more productive activities—wine/oil pressing and fermentation, ceramic manufacturing, etc. Sites like Farmstead 9, Ager Lunensis, La Spezia (Gadd 1986) and Giardino Vecchio, Grosseto (Attolini, Cambi, and Celuzza 1982, 1983; Cambi 2002) (Figs. 12.9 and 12.10) are distinct from the more commonly accepted "villa rusticae" like Villa Sambuco and Selvsecca (both near Luni) (Ostenberg 1960; Berggren 1969, respectively) (Figs. 12.11 and 12.12) only by virtue of their somewhat more humble materials and possible lack of a second story.

Very few of the above-described sites had quantified material culture included in the publications that describe them, and, thus, it is difficult to generalize about their ceramic, environmental, and small finds profiles.[3] When this is indicated, most sites produce a range of fine wares, cooking and storage wares, as well as loom weights. The larger, more complex, and/or long-lived of the corpus have also yielded some small quantity of "luxury" objects—jewelry, bronze decorations for furniture and the like.[4]

text continues on p. 442

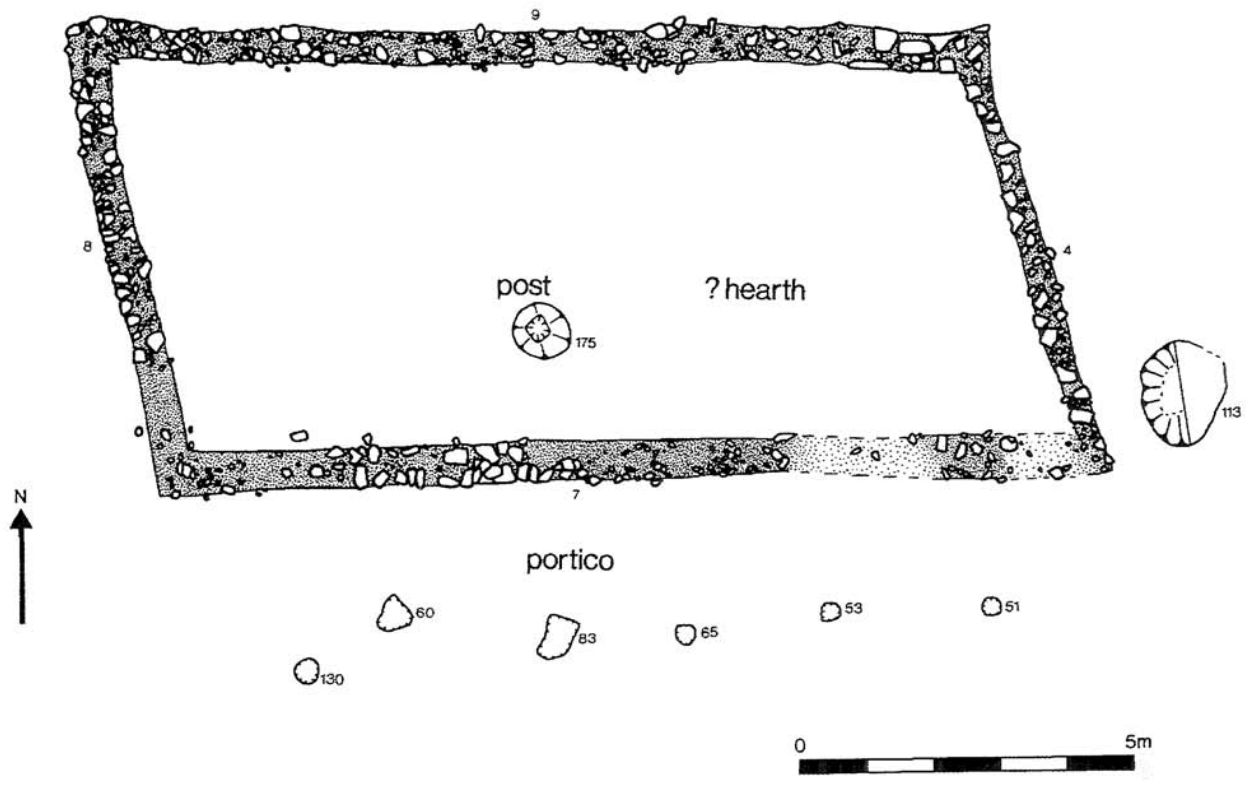


Fig. 12.1 Podere Tartuchino, Phase 1 (Perkins and Attolini 1987: fig. 5).

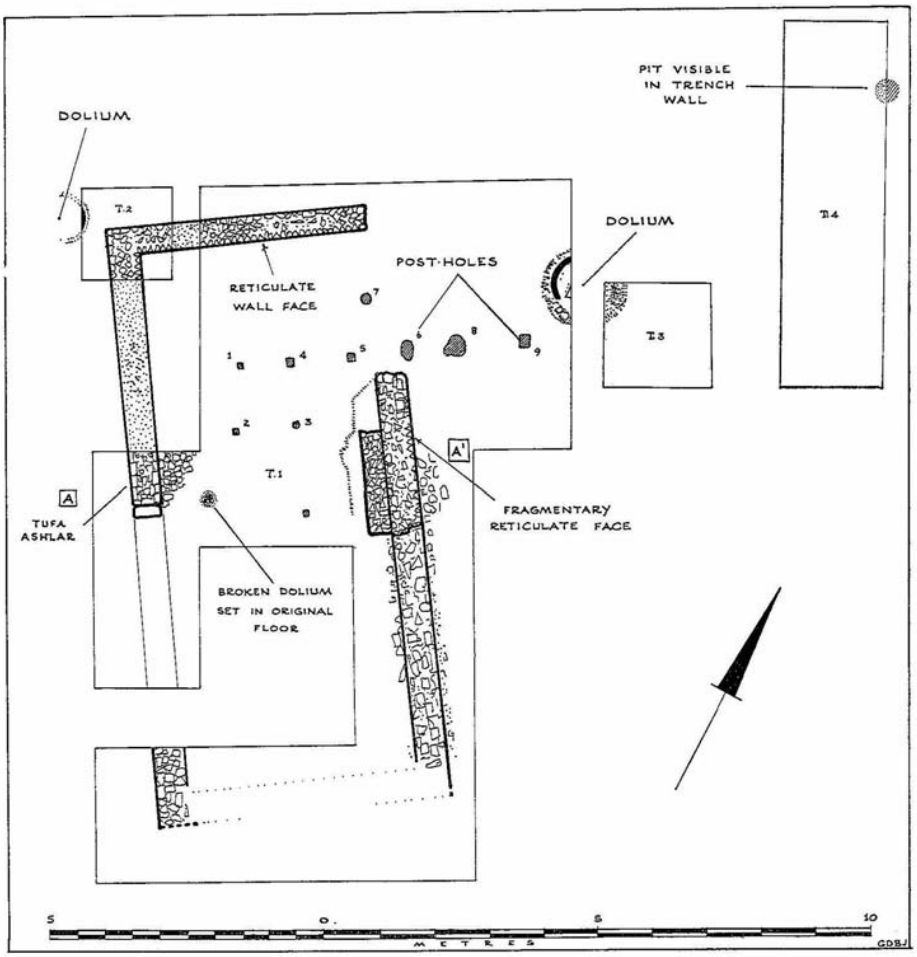


Fig. 12.2 Monte Forco, composite plan (Jones 1963: fig. 18).

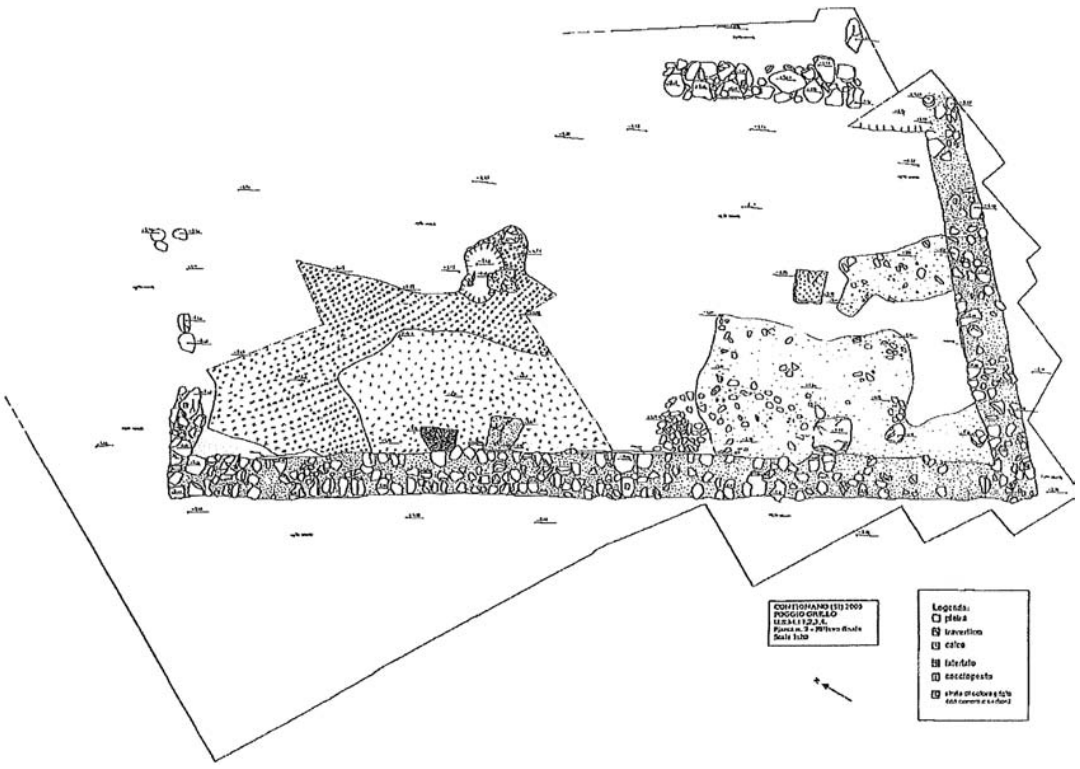


Fig. 12.3 Poggio Grillo (Barbieri 2005b, fig. 7).

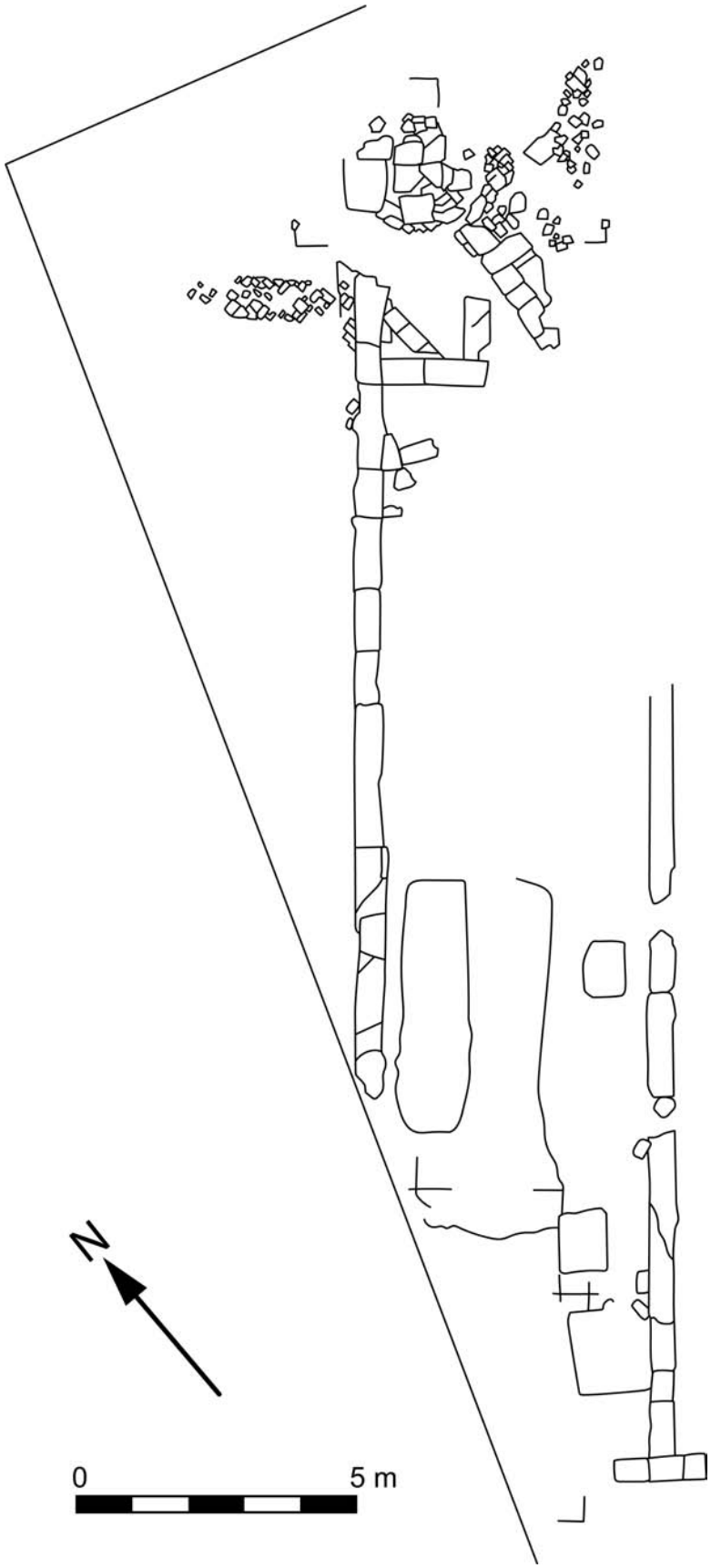


Fig. 12.4 Campo La Noce, composite plan (Di Matteo 2005: fig. 3; redrawn by Ardeth Anderson).

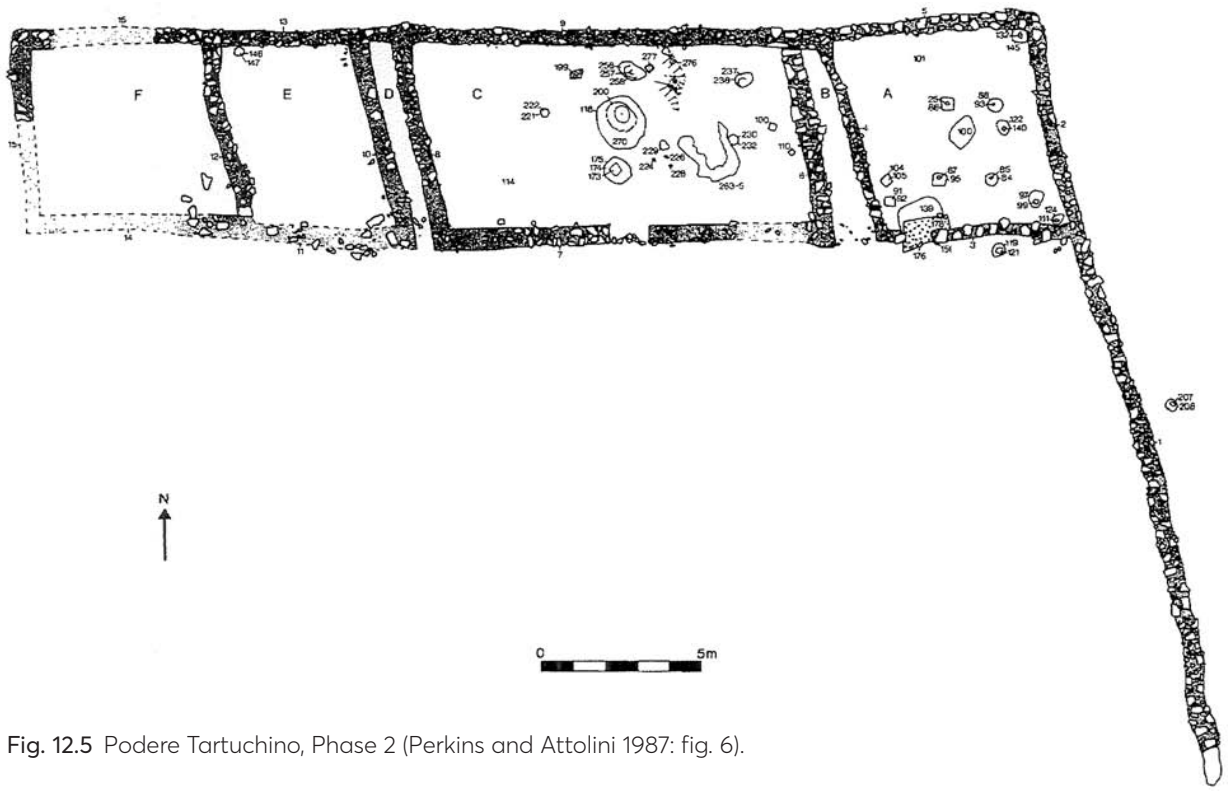


Fig. 12.5 Podere Tartuchino, Phase 2 (Perkins and Attolini 1987: fig. 6).

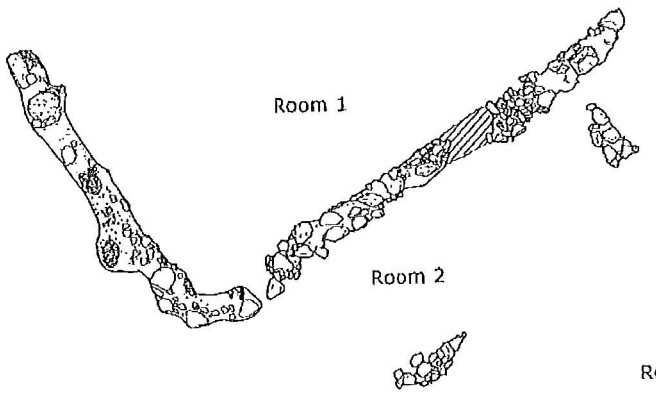


Fig. 12.6 Podere Cosciano, Phase 1 (Camin and McCall 2003–04: fig. 2).

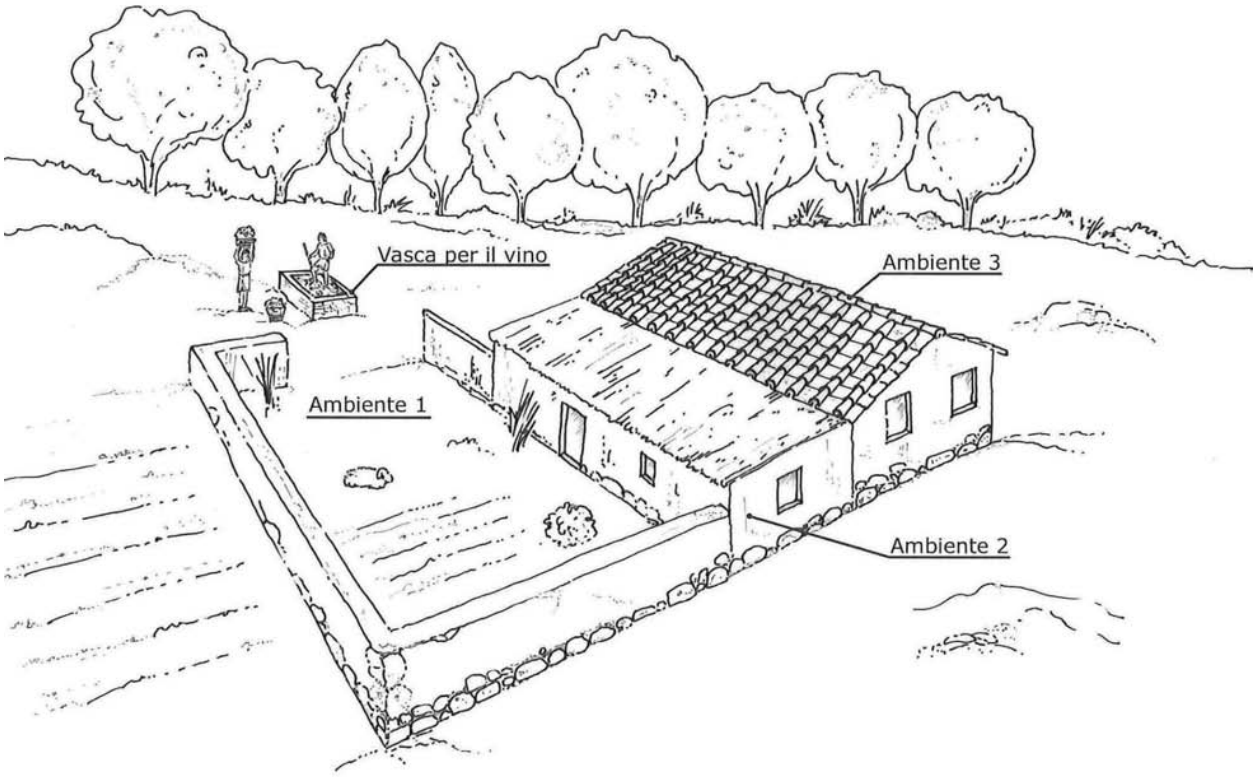


Fig. 12.7 Podere Cosciano reconstruction (Camin and McCall 2003–04: fig. 3).

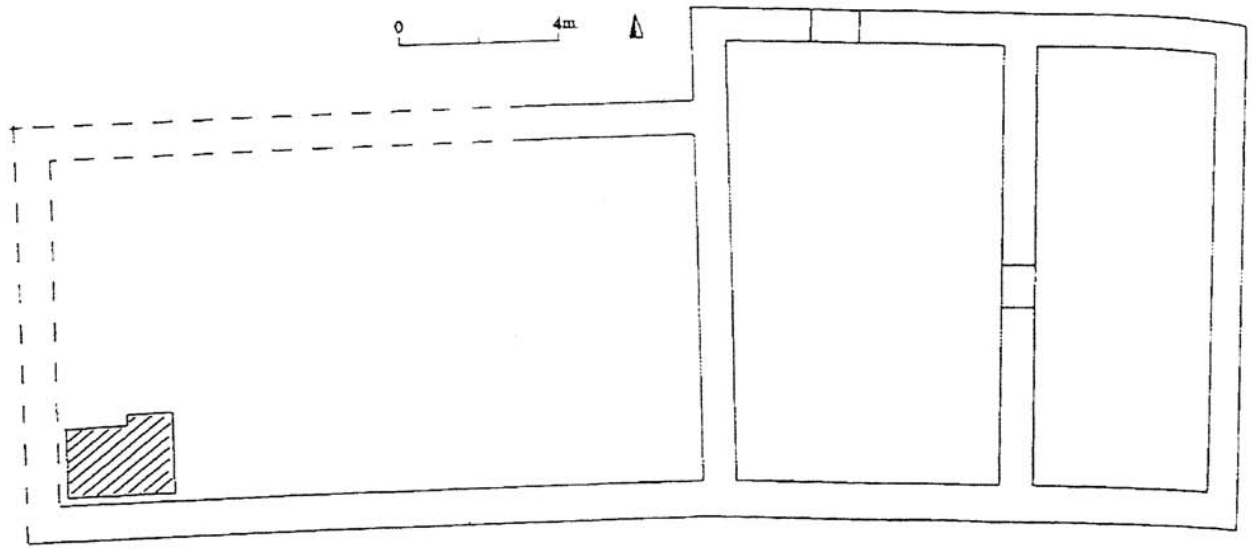


Fig. 12.8 Podere S. Mario, Phase 1 (Motta, Camin, and Terrenato 1993: fig. 3).

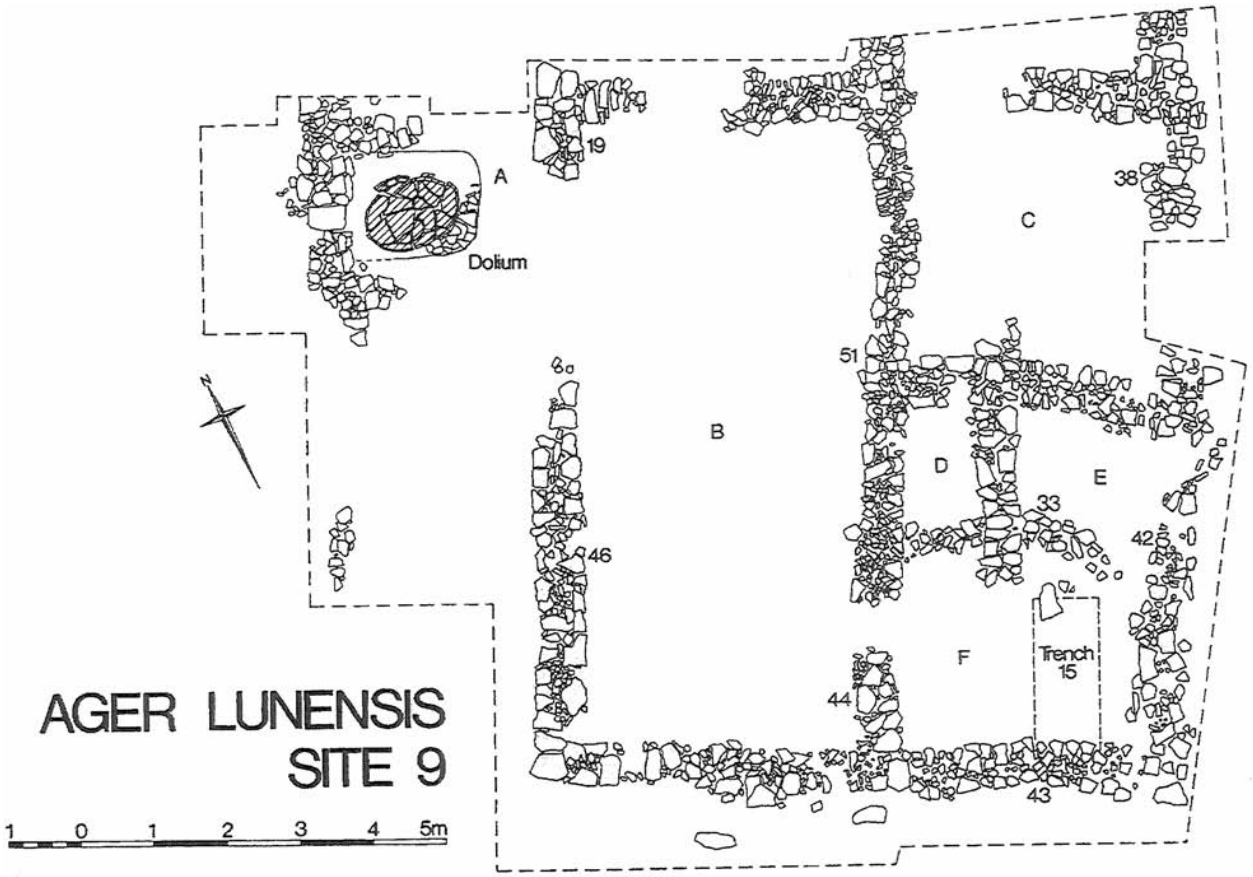


Fig. 12.9 Site 9, Ager Lunensis (Gadd 1986: fig. 12).

While these sites were never specifically interrogated for the households who produced them, most of the excavators have assumed that they represent rural non-elite families. Many of these sites have been associated with colonists, settling in allegedly centuriated landscapes: Monte Forco, Masseria Nocelli, Ager Lunensis Farm 9, the early phases of Palazzaccio, Fossa Nera A, and Fossa Nera B originate more or less at the same time as the establishment of a nearby colony and have been identified as the houses of veterans and their families. But the consistent material culture noted above is not limited to veterans' households: Campo La Noce, Monte Bono, Poggio Grillo, Podere Cosciano, and Podere S. Mario are not located near colonial settlements yet share many of the same features. The latter two have been specifically identified as "pre-Roman" Etruscan families, despite their seemingly later or unclear date. In any event, whatever the ethnic or political identity of these households, the material cultural residue of their activities remains quite consistent, at least at the most basic level. The tendency of some of these households to expand—if not in membership then certainly in material prosperity—seems a characteristic of the 1st c. BC and AD.

Taking Wilk and Rathje's activity list for households together with the known spatial apparatus of these rural houses, we might, by deduction, formulate a working definition of the Roman peasant house—one that represents both a generalized collection of likely household activities on the one hand, and the status quo of our knowledge about Roman peasant spaces on the other. Thus, we should expect to find the physical traces of some combination of the following: agricultural processing, butchery, cooking, construction, animal rearing, storage, dining, buying and selling of goods, and other forms of consumption. How many and in what combination of these activities we might expect from a Roman peasant household remains to be determined. We can further expect these activities to be framed by a simple rectangular structure with at least a dry-stone foundation and an

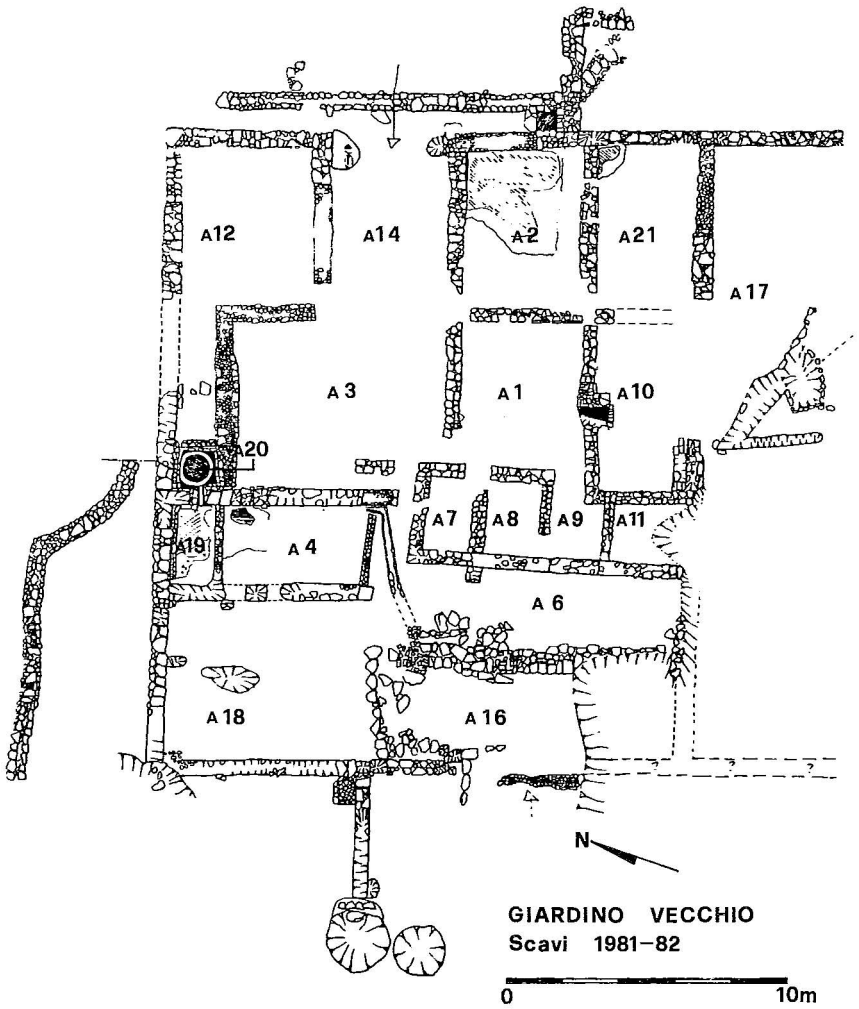


Fig. 12.10 Giardino Vecchio, plan of excavated remains; in grey location of surface scatter (Cambi 2002: fig. 53).

articulated outdoor space—like a yard, courtyard or fore-court, outdoor storage space—which is used for storage and other activities.

This rather wordy check-list is not intended to present "the" definition of a Roman peasant house. Rather, it will serve as a useful way of measuring our results against the status quo of theoretical and archaeologically derived definitions. Where definition and data diverge will be the point of real interest.

12.3 The Spaces and Activities of the Roman Peasant Project (KB)

Before considering the project data further, it is important to note a series of post-depositional factors and excavation methodologies that affected the measurement of household activities in our project. The most important of these is ancient recycling (cf. Foxhall 2000; Pettegrew 2006). As revealed at Poggio dell'Amore and indicated by secondary data from the other sites' building stones (see Ch. 16 below), Roman rural dwellers in the locale retrieved stones, roof tiles, and perhaps other objects from abandoned structures and re-used them to make new ones. This activity could adversely impact the material culture from a given site if it had been subject to such activity. With that warning in place, many of the categories we have used to quantify and qualify activities are not among those materials most likely recycled: animal bones, broken ceramics and glass, pollen and macro-remains are unlikely to be reused. Whole vessels, roof tiles, nails, and other visible metal would be the most likely to be removed and the absence of these would alter some counts.

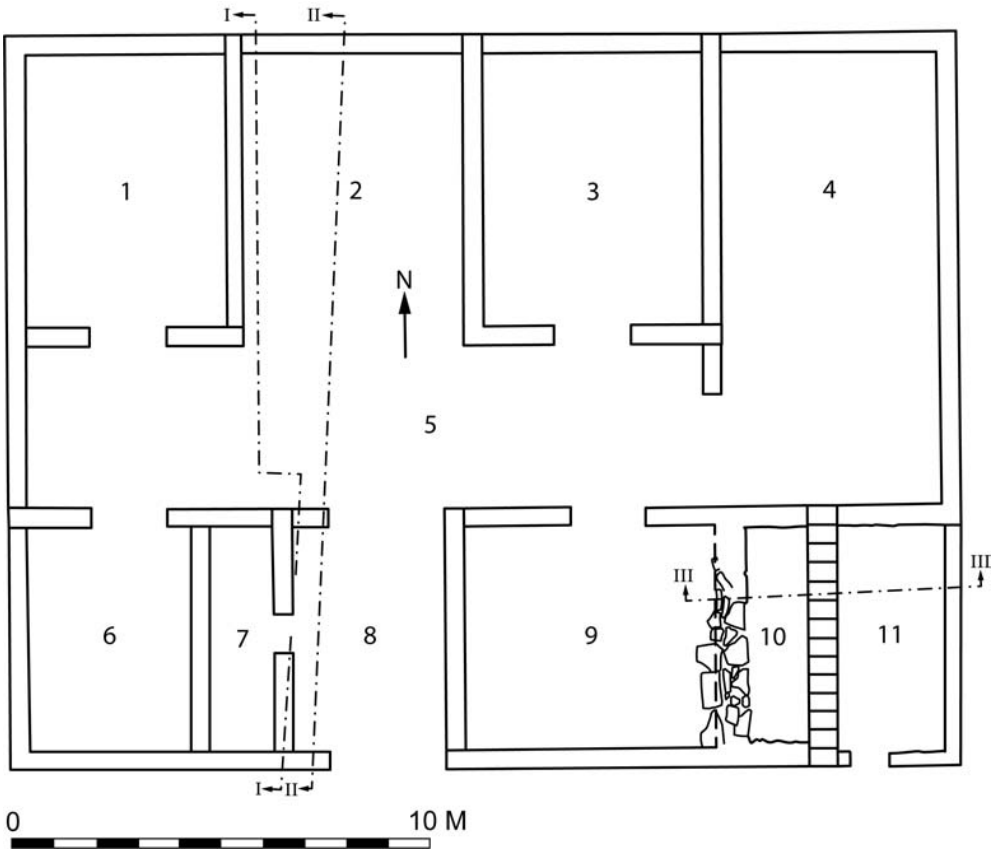


Fig. 12.11 Villa Sambucco, reconstructed plan and section (after Ostenberg 1960: fig. 287; redrawn by Ardeth Anderson).

Any systematic removal of trash during the life of the site is another limiting factor. The above-described corpus of previously excavated peasant sites included some (notably Monte Forco, Ager Lunensis Farm 9 and Poggio Grillo) that had large trash pits located anywhere from 7–35 m away (typically downslope) from the sites in question. Among project sites, Podere Terrato, for instance, had some nearby scatters that were not investigated which could have represented such near-site rubbish disposal, while other sites, like Marzuolo and Pievina, had rubbish tips on-site. As we never tested these near-site scatters, we have no way of knowing how common such disposal was versus on-site disposal.

Likewise, plowing, erosion, and other post-ancient depositional activities would affect these sites' overall material culture profile. All our sites were subject to plowing. As we did not systematically collect materials from the plow soil, the overall quantities of materials from all sites was necessarily lower than it might otherwise have been. Whether this practice systematically biased our results is not clear: a variety of field tests have shown that only <3–15% of ceramics on an excavated site are typically situated at the surface level (Ammerman 1985; Tingle 1987; Clark and Schofield 1991), although some studies have found more (cf. Schörner 2012). Potentially more significant is work that indicates a different range of functional classes in the plow soil and subsoil levels versus those found in stratified layers, although at the current state of debate on the topic, it is not clear how our counts might be affected by this factor (Schörner 2012). Erosion played a less ambiguous role: several sites were subject to erosion (e.g., Podere Terrato, parts of Pievina and Tombarelle) which was visible taphonomically in both ceramic and faunal collections. In all these cases erosion stripped away stratified contexts, preserving them only near walls, and had a detrimental impact on all finds. As erosion took place across a range of our sites, however, its effects were distributed rather than skewing any one type of site or activity.

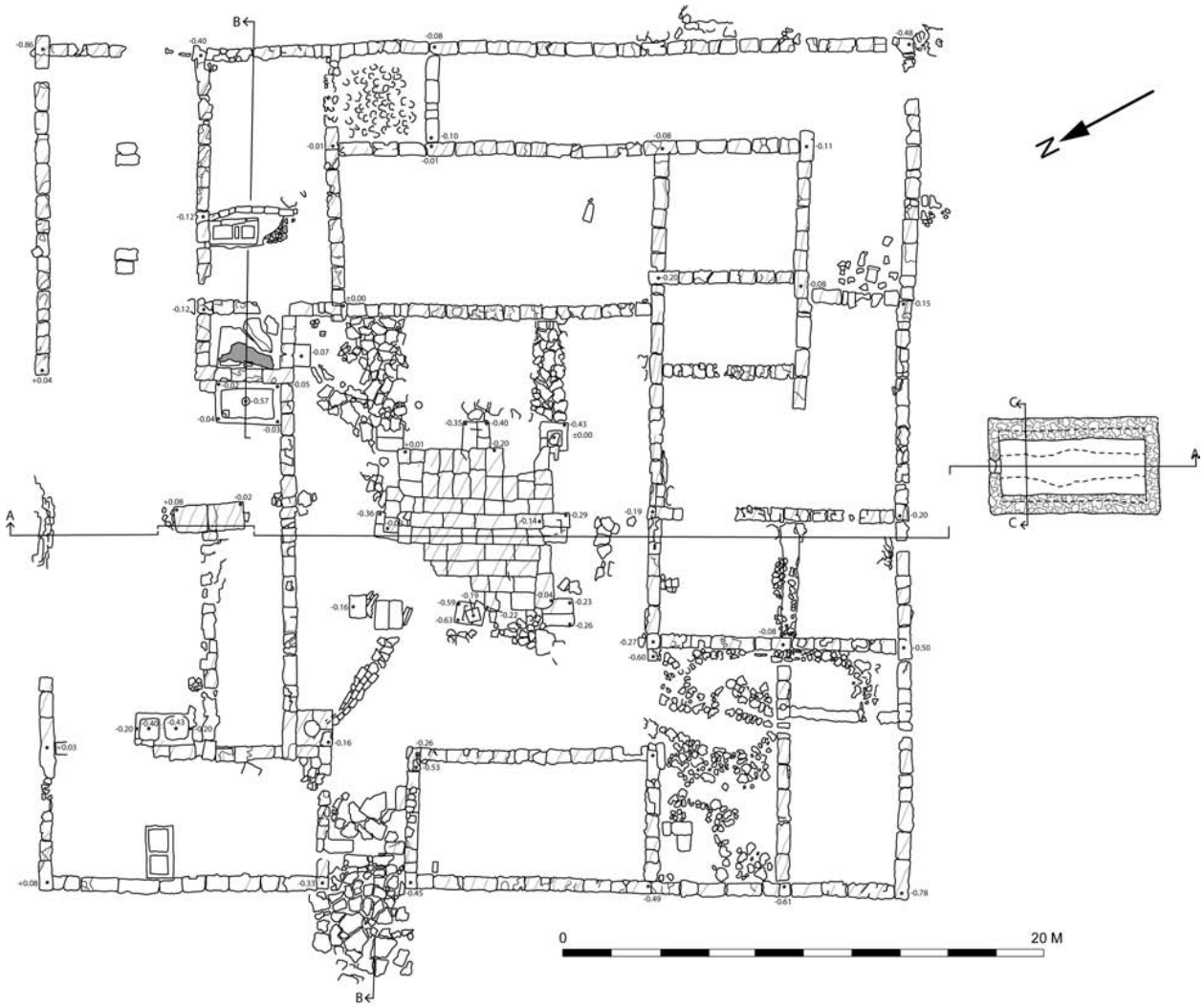


Fig. 12.12 Selvasecca, plan, phase 2 (after Berggren 1969: fig. 27; redrawn by Ardeth Anderson).

Finally, it is possible that sites involved in production were, unknowingly, preferentially selected by the project for excavation. Owing to their material richness, production sites for agro-processing or artisanal production often throw up more abundant surface remains. Likewise, sites with ceramic and/or agro-processing installations produce strong magnetic signatures and register strongly on magnetometry surveys. For both these reasons, production sites may "over-register," both in remote sensing surveys and in this project particularly.

Keeping in mind these limiting factors, the following description summarizes the project excavations in rough, descending order of their correspondence to the above-defined notions of "house." As our analysis proposes to integrate space and activities, considerable attention has been paid to the finds which parse such activities: Table 12.1 summarizes the ceramic, faunal, and small finds by MNI for all sites, while Table 12.2 provides a specific overview of the functional categories of ceramics.

Pievina, excavated in the project's first season, included two very different sizes and kinds of activity spaces in its two principal phases. The first phase was comprised of a variety of buildings spread over a relatively large area—a granary, kiln and cistern with outdoor hearth, plus unexcavated structures to the N. This phase seemed to be a kind of farm with buildings of different functions dispersed around the site. We hypothesized that living quarters may have existed in the unexcavated areas to the N. The second, late antique phase consisted of a small, tile-roofed, stone

structure with a wooden, post-built extension (total building size was 9.8 x 4.5 m) surrounded by a hearth, drains, midden, and a large beaten earth yard that stretched downhill some distance. Both periods were rich in ceramics, faunal material, and small finds including coins (in this first season we did not carry out botanical analysis)—some of the richest in the project in all categories. Ceramic collections in the first phase were dominated by kitchen wares (50%) with slightly less tablewares (43.33%) while the second phase had a dominance of tablewares (58.61%) and somewhat fewer kitchen wares (25.86%). Dolia for storage were virtually absent in both phases.

Podere Terrato was highly damaged by erosion but contained a number of features which seem to indicate more settled, "house"-like function. The main building measuring 11.5 x 5 m, consisted of a room and a porch supported by a single pier. While the building and its surrounds were highly eroded, adjacent were a series of retaining walls which pollen evidence allowed us to tentatively describe as a garden. Nearby was a yard with multiple packed surfaces containing the majority of the site's modest material culture, which, while it lacked significant faunal material, did contain a number of coins. Ceramics were dominated by dining wares (74.49%) with a smaller quantity of wares used for cooking (17.74%), while no dolia for storage were present. Nearby lay a drain, seemingly to pull off the locally saturated groundwater.

Marzuolo and Tombarelle represent two very different sites both seemingly partially or wholly dedicated to ceramic production, but also with important

Table 12.1 Summary of material culture (ceramics, small finds, faunal material, MNI) by site (KB).

Site	Scatter(s) size, overall site (m^2)	Covered structure size (m^2)	Ceramics (MNI)	Faunal (NISP)	Small Finds (NISP)	Characteristics of botanical data
Pievina (Phase 1)	15,000	60 (granary)	30 (NB: not all contexts quantified)	27	15	Unknown
Pievina (Phase 2)	15,000	40 ("house")	232	292	89	Unknown
Case Nuove (Phase 1.1)	1785	none	45	15	0	
Case Nuove (Phase 1.2)	1785	none	50	15	164 (for all Phase 1)	Olive/grape accumulation from distant sources
Case Nuove (Phase 2)	1785	none	72	229	66	possible grain processing
San Martino	500	42	47	2	6	Fodder accumulation, coprophilous fungi
Poggio dell'Amore	600	13	21	4	24	Fodder accumulation, coprophilous fungi
Colle Massari Romano	460	none	11	1	1	
Podere Terrato	2000	96.5	62	3	44	Garden plants
Marzuolo (Phase 1)	25,000	63.5 (Structure 3)	421	339	95	
Marzuolo (Phase 2)	25,000	none	334	126	309	Larger scale grain production
Marzuolo (Phase 3)	25,000	63.5 (Structure 3)	251	195	214	
Tombarelle (Phase 1)	16,000	none	109	59	59	Larger scale grain production
Tombarelle (Phase 2)	16,000	none	29	7	17	
Tombarelle (Phase 3)	16,000	none	190	100	26	

Table 12.2 Major ceramic forms, all sites (EV).

FORMS	Kitchen (includes KW and VRI)	Dining/Storing (includes CW, FW and CCW)	Transport and Storage	Lighting	Other "Functional" Ceramics
Pievina Phase 1 (159 diagnostics/30 MNI)	50	43.33	6.66	0	0
Pievina Phase 2.2 (310 diagnostics/232 MNI)	25.86	58.61	11.2	0.86	0
Case Nuove Phase 1 (117 diagnostics/45 MNI)	44.44	46.66	8.51	0	0
Case Nuove Phase 1.2 (174 diagnostics/50 MNI)	26	58	10	4	2
Case Nuove Phase 1.3 (92 diagnostics/27 MNI)	22	40.7	33.32	3.7	0
Case Nuove Phase 2 (190 diagnostics/72 MNI)	37.5	61.1	1.38	0	0
San Martino (85 diagnostics/47 MNI)	38	44.68	12.76	0	2.12
Poggio dell'Amore (41 diagnostics/21 MNI)	28.56	61.88	9.52	0	0
Colle Massari Romano (13 diagnostics/11 MNI)	45.45	27.27	18.18	0	9.09
Podere Terrato (102 diagnostics/62 MNI)	17.74	74.19	8.06	0	0
Marzuolo Phase 1 (730 diagnostics/421 MNI)	20.66	67.69	6.65	2.85	2.13
Marzuolo Phase 2 (3014 diagnostics/334 MNI)	2.69	85.02	11.97	0.29	0
Marzuolo Phase 3 (533 diagnostics/251 MNI)	27.49	47.01	19.92	5.17	0.39
Tombarelle Phase 1 (257 diagnostics/109 MNI)	24.77	67.88	5.5	0.91	0.91
Tombarelle Phase 2 (34 diagnostics/29 MNI)	27.5	62.06	6.89	3.44	0
Tombarelle Phase 3 (367 diagnostics/190 MNI)	21.54	75.78	1.57	0	1.05

domestic components. At Marzuolo, the site was a planned settlement dedicated to the production of Italic sigillata on an expanding scale. In Phase 1 (30–10 BC) the kilns lay in close proximity to a large rectangular building (Structure 4) which may have been used for cooking, dining, and perhaps weaving, judging from the ceramics and loom weights found in the nearby dumps. A number of items of personal adornment (rings) were also found. Material culture from this phase was very rich, including faunal remains. While it is difficult to distinguish ceramics discarded after manufacturing from those also used domestically, nonetheless a modest (20.66%) collection of cooking wares were present alongside a majority of tablewares (67.69%) and 2 MNI of dolia. In Phase 2, the domestic functions were seemingly located further from the industrial-scale kilns; only a possible hearth with faunal material and ceramics attest to cooking and dining nearby. In both phases, we have supposed that ceramic production would have

been seasonally punctuated, and habitation and production would focused on spring/summer months. Finally, in Phase 3 when ceramic production had seemingly halted, parts of the sites were backfilled and possibly laid out for farming, while Structure 4 appears to have been used exclusively for domestic purposes. Again, material culture was very rich. Ceramics again showed a minority of kitchen wares (27.49%), a sizable collection of tablewares (47.01%) and 2 MNI of dolia. Small finds again reveal furniture, while items of personal adornment and a die speak to leisure and needles describe sewing activities.

Tombarelle, yielded less abundant, but nonetheless important evidence for ceramic production, while domestic activities were harder to pin down. The four different excavated areas appear to correspond to three or four different phases and activity areas: a set of cuts filled in from 40–10 BC that included coarse ware ceramic wasters; a cistern of unknown Roman date; a pit and accumulation of downslope wash of Augustan date that also included coarse ware, tile wasters and a possible kiln spacer; and a pit and paved area of late antique date that also included a high quantity of overfired Color-coated wares and kiln waters. No closed structures were found and it is hypothesized that these, if they existed, lay to the W. The four areas excavated seem to represent cuts and rubbish deposits from specialized activities distributed around that part of the site. While material culture of these activity areas was relatively rich in most of the phases, it had unusual characteristics in both taphonomy and content—large sizes, low breakage, wild animals, etc.—which differed from more typical domestic patterns. In Phase 1, a typical ratio of kitchen wares (24.77%) and tablewares (67.88%) was found with highly unusual faunal remains, including large quantities of cattle and wild animals. We supposed that this represents a more permanent settlement of some kind that included coarse ware ceramic production. The second, rather ephemeral phase of Tiberian date likewise had typical ceramic profiles, evidence for ceramic and tile production, but very few faunal remains, while the final Phase 3, which was dominated by two large dumps of ceramics and roof tiles, some seemingly manufactured on site, yielded one of the largest caches of ceramics in the site with a typical formal profile, but again seemingly the product of a deliberate quick fill rather than domestic rubbish. This phase, particularly if it was dedicated to ceramic production, may be more short-term than the first. An Etruscan tile stamp in the late antique fills described a collective entity (σ*p*[*ural*]) and, on the whole, the site seemed to represent a kind of central place where ceramic production and water collection took place among other activities.

The sites of San Martino and Poggio dell'Amore both seem to represent the same set of activities with similar architectural form. San Martino consisted of a 7.2 x 6.5 m square structure with a single room entered via one door. The roof may have been of straw or tile, if the latter it was totally recycled in ancient times. Despite extensive excavations around the site, no exterior features, such as hearths or storage, were found. The site was marked by a paucity of material culture of all kinds. Small quantities of ceramics for dining and cooking appeared in almost equal percentages (44.68% dining, 38% cooking) with a single dolia MNI. The site had a remarkable botanical profile which featured a distinct presence of Fabaceae or leguminous fodder crops, as well as a notable quantity of fungi and parasites associated with animals. It was hypothesized that, whatever its human domestic uses, the space was also used for the intermittent stabling of animals.

Poggio dell'Amore was almost completely spoliated in ancient times, including the roof and three of its four walls. Nonetheless it was reconstructable as a ca. 4.6 x 2.8 m structure with a tile roof. Two possible exterior features against the remaining wall may have been a hearth and dolia seat, although the identity of these was not clear. Material culture was even more sparse than San Martino, but here, as at Podere Terrato, there was a major preponderance of ceramics dedicated to dining (61.88%) with considerably less for cooking (28.56%) and no dolia for storage. The site also had a small but significant collection of vessel glass, but no coins. The botanical profile was very similar to that of San Martino, with a high quantity of leguminous fodder pollen as well as coprophilous fungi pointing again to animal stabling.

The final two sites provided the least evidence of household activity or houses. Case Nuove was found to be a mid-1st c. BC pressing site for the processing of grapes and olives and presumably only used seasonally. Its material culture was relatively lacunose in this period and ceramics consisted of a rare balance between kitchen forms (44.44%) and tablewares (46.66%) with no dolia for storage. The

two later abandonment phases of the site—the Augustan-period infill of the tank, the construction(?) and abandonment of a cistern and cutting and infill of a square pit in late antiquity—produced a richer material culture, seemingly impacted by that of the nearby villa. No covered structures were found here in any phase and throughout its life, the site seems to have served a variety of agricultural processing activities only. In the earlier phases, those activities appear to have taken place principally during the two harvests for grapes and olives in late summer and late fall, respectively. During late antiquity, it appears that the site was used for the winnowing or threshing of grain.

Finally, Colle Massari Romano was a field drain, probably of 1st c. AD date, measuring some 13 m in length and built to drain a natural upwelling and pooling point for ground water. Its virtually absent material culture had been used as construction material. No covered structures were found.

12.4 Parsing the "Domestic" (KB)

Very few of the above-described eight sites fit our working definition of "peasant house." Those on the smaller end of the spectrum, San Martino, Poggio dell'Amore, and possibly Podere Terrato, have considerably smaller structures, lack hearths, external installations like dolia and presses and other indicators of on-site processing and dining, and have a lacunose material culture. Some sites like Tombarelle, Case Nuove, and Colle Massari Romano have no covered structures at all. Marzuolo Phase 1 looks most like the extant peasant houses from central Italy—rectangular structure, dolia and possible lean-too installations outside, material culture with personal items as well sewing/weaving implements—but it is clearly part of a planned settlement whose *raison d'être* was the manufacturing of Italic sigillata. Only Pievina Phase 2 with its external installations, part tile, part straw roof, abundant material culture describing cooking, dining, stock rearing, and personal adornment really fits the peasant house canon.

Why the project should have excavated so few "canonical" peasant house sites is important to consider. Following a dominant trend in Italian field survey studies (Cambi 2002; Patterson 2004; Fentress 2009; Launaro 2011; Goodchild 2013; cf. Witcher 2012), we originally assumed that small scatters, here under 50 x 50 m, represented the remains of peasant houses or farms. Two seasons and five site excavations focused on those small scatters, all of which yielded different kinds of sites: a pressing site, temporary animal stalls, field drains. Beginning in the fourth year of the project, we attempted to rectify this and to find more permanent sites. This led to the excavation of a ceramic factory (Marzuolo, interpreted as a village from the survey evidence) and a probable site for ceramic production and other functions (Tombarelle, labeled as a village or large settlement in the survey), whose habitation section we may have failed to excavate. In retrospect, sites identified either as "village" (Pievina), "large settlement," (Tombarelle), or "fattoria" in Ghisleni's survey may have represented different forms of peasant house sites. In the case of the former two categories, the multiple scatters may have represented a permanent residential structure surrounded by agro-industrial installations—as was the case with Phase 1 Pievina—while the "fattoria/farm" category may have represented the single-structure standard peasant "house." This is mere musing, however. Overall, and in concert with recent critiques (Witcher 2012), our results emphasize the unreliability of surface survey for functional attributions, without extensive, open-area excavation as a check.

While failing to consistently locate and excavate canonically defined peasant "houses," we did reveal a range of sites and spaces beyond the domestic—or better, a range of specialized sites for particular "domestic" activities set at some distance from one another in the landscape. Indeed, the range of sites excavated by the project is far more diverse than the series of previously excavated sites we used to construct our working definition of "house." This is true both at the "smaller" end of the spectrum—the sites of San Martino and Poggio dell'Amore are considerably smaller than anything excavated in central Italy previously—and at the larger end—the sites of Marzuolo and Tombarelle as places for ceramic production represent site categories that have not hitherto been incorporated into analyses of the activities and identity of peasant households. The project also excavated a series of sites associated with production, both craft and agricultural.

This expanded range of functional categories and their material culture may help to both refine and expand our definitions of peasant houses and

households (see Table 12.1). Indeed, it is significant that no particular material parameter seems to provide a definitive indicator that a site can be interpreted as a "house." Large sized sites—measured by their scatters or their covered structures—yielded significant evidence of domestic activities, but so did sites also seemingly dedicated to production (Marzuolo and Tombarelle). Sites with a numerically rich material culture (Tombarelle in all phases) are missing covered structures and/or (as at Pievina Phase 1, Marzuolo Phase 1, and Case Nuove) seem principally dedicated to production rather than "domestic" activities. Sites like San Martino and Poggio dell'Amore have covered structures but little material culture and as strong evidence for the presence of animals as for humans. Homing in on individual material categories presents no obvious solutions: large ceramic numbers are not necessarily accompanied by the small finds that indicate construction, ornamentation, or trade, or by evidence of plant accumulation. The only obvious trend here is that large sites yield more household-associated material culture than small ones, even within spatially small individual phases.

More detailed analysis of our most numerically robust find, ceramics, likewise failed to yield any consistent trends. Assuming ceramic supply may have been different in the late Republic versus late antiquity, we analyzed just the more robust late Republican/early imperial sites along the above-described hypothetical spectrum of smaller/sporadically used sites to larger, more permanent sites. Figures 12.13 and 12.14 present the major ceramic classes and major forms along this spectrum. No distinct changes can be noted, the large spike in fine wares at Marzuolo Phase 2 being caused by the production cache from this period. When tableware forms alone are analyzed along this same spectrum (with the aberrant Marzuolo Phase 2 removed), there may be a slight increase in the percentage of open form tablewares (dishes, bowls and cups) in the larger, more permanent sites on the right side of the graph (Fig. 12.15). While this might be taken to indicate different dining patterns at these sites, an examination of the fine ware trends suggest that this may be simply a relic of the somewhat higher rates of fine wares that reached those sites, in which those open forms are largely produced. (Fig. 12.16). The quantities of dolia at all sites were so tiny as to be not a useful barometer of permanence or "domestic-ness."

As the above exercise demonstrated to us, one of the reasons it seems hard to locate the "domestic" in the project data is the overwhelming evidence for production.[5] From crop processing to animal stalling, field drainage to the production of tiles and coarse wares, many of the sites excavated by the project have an important, sometimes even dominant production activity. Tombarelle, for instance, with its three-plus centuries of possible coarse ware and/or tile production and other activities distributed over a hillside, not only reveals a site type largely unknown in Italy, but the tip of a landscape littered with ceramic production facilities, as has begun to be revealed elsewhere in the Mediterranean (e.g., Rieger and Möller 2011). These production spaces often have evidence of more traditional domestic activity as well: indeed, as noted above, in its size, shape, and material culture dominated by personal goods Structure 4 at Marzuolo Phase 1 is perhaps closest to the standard corpus of peasant houses from central Italy. Similarly, the evidence for cooking and dining at Case Nuove and the dining, cooking and storage wares at San Martino and Poggio dell'Amore all point to so-called domestic activities within sites whose *raison d'être* was animal stabling or processing.

12.5 Multiple Correspondence Analysis (SCE)

The above, largely qualitative analysis of our data suggests that only a very small number of the sites we excavated correspond to the status-quo definition of "peasant house," while most lie uneasily at its margins. The project data suggest that the locale should not be imagined as being dominated by houses in the traditional sense, but rather as having included a variety of sites, potentially of different functions, in which agricultural and craft production were prominent.

While this provides one kind of answer to the question of where peasants lived, it still leaves many others: what is the relationship of the non-house sites with household spaces? Are these sites necessary annexes to spaces of household activity? How did all of these spaces work together in an individual family's year or life? That is, thus far our analysis

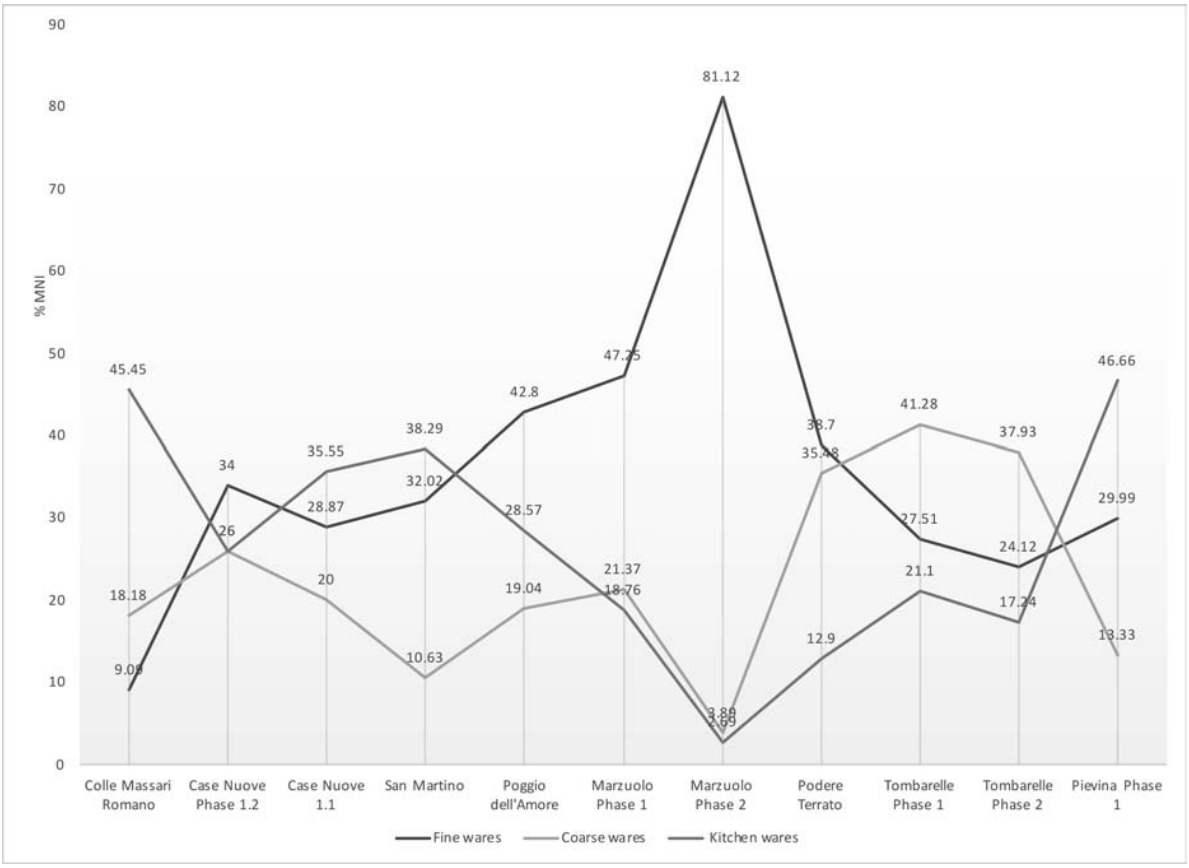


Fig. 12.13 Major ceramic classes, along a spectrum a habitation (% MNI), late Republican/early imperial sites only (KB).

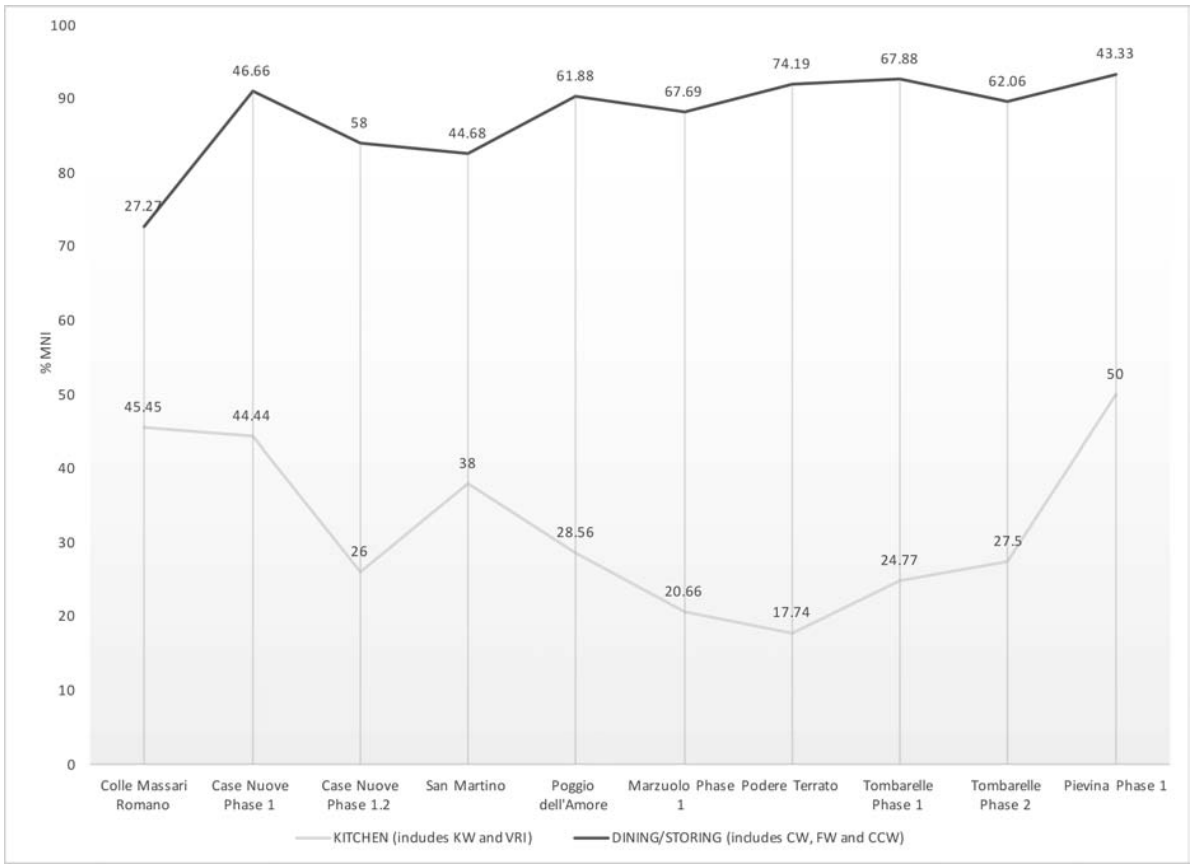


Fig. 12.14 Major ceramic forms, along a spectrum of habitation (% MNI), late Republican/early imperial sites only (KB).

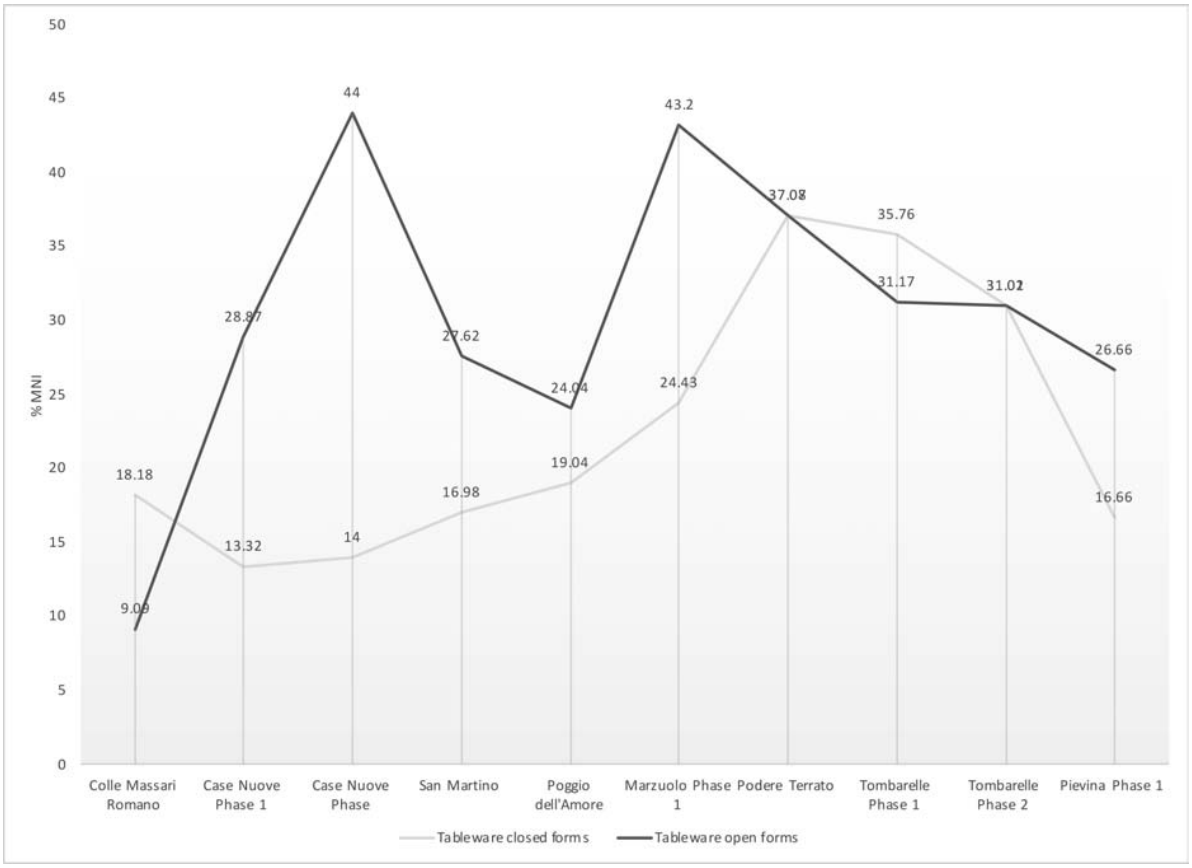


Fig. 12.15 Major tableware forms, along a spectrum of habitation (% MNI), late Republican/early imperial sites only (without Marzuolo Phase 2) (KB).

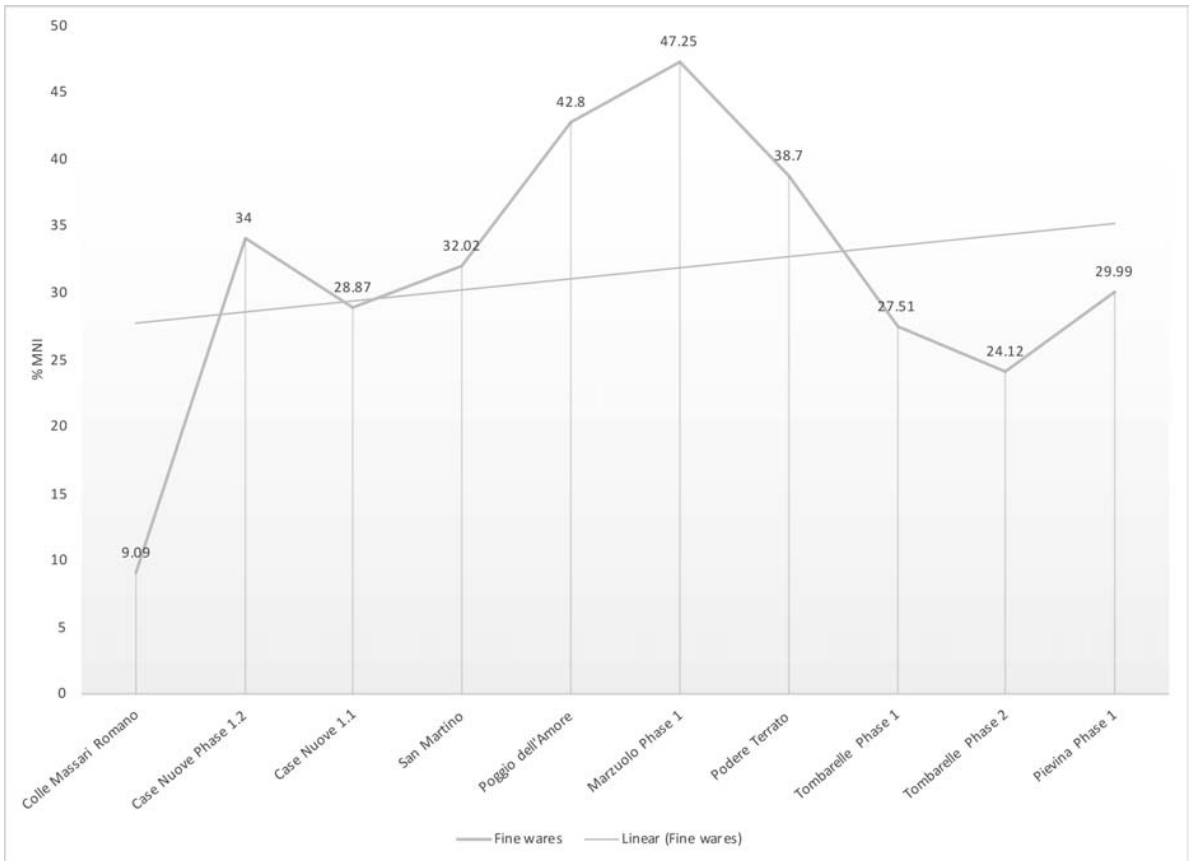


Fig. 12.16 Fine wares, along a spectrum of habitation (% MNI), late Republican/early imperial sites only (without Marzuolo Phase 2) (KB).

leaves unresolved the utility of the data as a whole. Individual data types are unreliable guides to "domestic-ness," but perhaps the data taken as a whole might be more forthcoming.

Multiple correspondence analysis (MCA) provides one avenue for considering the data—and our sites—in their totality. It is a multivariate statistical method that is highly useful for detecting patterns among different data points ("individuals"), like archaeological sites. Furthermore, MCA serves to illustrate not only the associations between different factors (qualities or attributes) at each site, but also the strength of association between those factors and their level of discernment. At the heart of MCA, as of correspondence analysis (CA), lies the process of singular value decomposition, which scales the number of dimensions of a data matrix (in this case, the dimensions are represented by categories of finds, e.g., ceramics, architecture, etc.). The result is a two dimensional biplot, with a measurement of "inertia" that shows the degree of difference preserved from the original data. Correspondence analysis has a long history in sociology as a way to distinguish between different *habitus* (Bourdieu and De Saint-Martin 1976), while the method entered archaeology first as a way to conduct seriation (Hill 1974, Bølviken et al. 1982). It has more recently been applied as a clustering technique, to find spatial and social patterns among artifact assemblages (Cool and Baxter 1999; Lockyear 2000; Pitts 2010; Peeples and Schachner 2012; Williams 2013). While there are many different types of cluster analysis, the ability of MCA to show strength of association between different factors, along with the discernment of different individuals, makes it especially appealing as a means to conceptualize site function.

Here we applied MCA to the full spectrum of finds of each site and major phase within that site (Table 12.3). The raw data required some transformation prior to the analysis. First, the table consisted of both quantitative and qualitative data. MCA uses categorical factors, and so it was necessary to render any quantitative information into bins (such as a scale of "0–10," "11–50," "51–100," or "Low," "Mid," "High"). Second, there are null values in the table, where information was unavailable. Third, the method of data collection was uneven at each site, which requires attention when dealing with raw counts of artifacts whose abundance or frequency is in part determined by the intensity of fieldwork. To resolve these various issues, the following steps were undertaken:

- Raw quantities of finds (total ceramic MNI, faunal NISP, coins, metal, and glass) were first multiplied by the inverse of the area under excavation in square meters (Table 12.3; this process was also done in Collins-Elliott 2018; technical notes at https://volweb.utk.edu/~scolli46/rppsf.html). Otherwise, differing quantities of finds could be attributed to different intensities of excavation.

- Histograms of the data in each column were examined in order to assess the distribution of the observed data.

- The total ceramic MNI, faunal NISP, coin count, metal object count, glass EVE, as well as the dimensions of covered structure(s) were observed to follow an exponential distribution. These columns were divided into bins of "Low," "Mid," and "High" using Tukey's interquartile ranges of $\ln(4/3) * \mu$ and $\ln(4) * \mu$ for the lower and upper bounds, respectively.

- The other columns containing percentages of different classes of finds (ceramic dining ware, cookware, storage, and amphora; faunal cattle, sheep/goat, pig, and the botanical taxa, types of building stone [diversity], and the maximum distance from the furthest stone source in km), which were not affected by the intensity of collection, were rendered into bins of "Low," "Mid," and "High" on the basis of terciles that divided the data up into groups of equal size.

- "None" was returned into any entry where there had been a zero value. In practice, this did not much change the general results of MCA.

Accordingly, every quantitative variable was recast with a categorical assignment of "Low," "Mid," "High," or "None." The other categorical variables in the remaining columns ("Significant Plant Accumulation" and "External Installation for Cooking or Storage") consisted of simple "Yes" and "No" responses. The revised table can be found Table 12.4. Multiple correspondence analysis was performed

Table 12.3 Multiple correspondence data, all sites.

	Ceramics (MNI)	Ceramics: Dining (% MNI)	Ceramics: Cooking (% MNI)	Ceramics: Storage (% MNI)	Ceramics: Amphorae (%MNI)	Ceramics: Uncertain/ NA to the main categories (%MNI)	Faunal (Total NISP - all taxa)	Faunal (NISP for cattle, sheep/ goat and pig only)	Cattle (%NISP)	Sheep/ goat (%NISP)
Pievina Phase 1 (late Republican) US 2003	30	43.33	50	0	6.66	0	27	23	13	26.1
Pievina Phase 2 (late antique) UUSS 1018, 1019, 1026, 1006	232	38.79	25.86	10.34	9.48	15.51	291	269	22.3	42.8
Case Nuove Phase 1.1 (late Republican dump)	45	42.22	40	4.44	8.88	4.44	15	14	50	21.4
Case Nuove Phase 1.2 (Augustan fill of tank)	50	60	26	0	8	6	142	73	0	34.2
Case Nuove Phase 1.3 (early 3rd c. AD fill of the cistern, US 5048)	27	37.03	22.22	18.51	18.51	3.7	65	5	0	20
Case Nuove Phase 2 (early 5th c. AD square pit)	72	51.38	37.5	9.72	1.38	0	229	174	18.3	45.9
San Martino	47	40.42	38.29	10.63	6.38	4.25	2	2	50	0
Poggio dell'Amore	21	57.14	28.57	9.52	4.76	0	4	4	0	100
Colle Massari Romano	11	18.18	45.45	9.09	18.18	9.09	0	0	0	0
Podere Terrato	62	69.35	19.35	4.83	6.45	0	3	0	0	0
Marzuolo Phase 1: early to mid- Augustan[a]	421	59.61	20.66	5.93	5.22	8.55	339	310	32.6	19
Marzuolo Phase 2: 50–70 AD[b]	85	34.11	11.76	3.52	47.05	3.52	126	100	14	43
Marzuolo Phase 3: 2nd–3rd c. AD[c]	251	29.88	27.49	4.78	16.33	21.51	195	138	17.4	31.9
Tombarelle Phase 1 (19000s). 40/30 BC to early/mid Augustan	109	59.63	24.77	9.17	5.5	0.91	59	36	58.3	19.4
Tombarelle Phase 2 (18000s). Augustan to Tiberian	29	58.62	10.34	20.68	6.89	3.44	7	7	28.6	71.4
Tombarelle Phase 3 (17000s). 5th c. AD (by the third quarter of the century)	190	45.78	21.57	27.89	1.05	3.68	100	80	46.3	20

[a]MZ Phase 1 (30–10BC dumps in Area 11000 (11012=11040; 11043; 11048; 11008; 11023; 11055), all Area 12000 and US 10130 only from Area 10000)

[b]MZ Phase 2 (Contexts 10093, 10065, 10057, 14051, 10055, 10071, 10073, 10076, 10080, 10081, 10082, 10083, 10085)

[c] MZ Phase 3 (Area 11000: 11029, 11030, 11047, 11016, 11034, 11027, 11002, 11051, 11053; Area 14000: 14001, 14006, 14013, 14015, 14017, 14002, 14004, 14009, 14010, 14011, 14014, 14025, 14026, 14027, 14028, 14034, 14035; Area 10000: 10045, 10124, 10125, 10126)

Pig (%NISP)	Metal (Count)	Glass (EVE)	Pollen (total count)	Macro-remains (total count)	LPPI (%)	Cereals (%)	Vitis (%)	Olive (%)	Other significant plant accumulation (Y/N)	Building Stones types?	Maximum distance to furthest building stone source (km)	External installation for cooking/ storage, etc.	Covered Structure (m^2)
60.9	20	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6	12	Y	60
34.9	79	3.04167	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	10	Y	40
28.6	9	0	N/A	0	N/A	N/A	N/A	N/A	N	N/A	N/A	N	0
65.8	116	0.35279	N/A	40	N/A	N/A	N/A	N/A	N	N/A	N/A	N	0
80	3	0	N/A	43	N/A	N/A	N/A	N/A	N	N/A	N/A	N	6.6
35.6	47	0.81966	7563	635	41.3	4.5	0.03	0.1	Y (Cereals)	N/A	N/A	N	0
50	5	0	4345	51	49.8	1.4	0	0.05	N	3		N	42
0	1	0	2329	446	46.2	3	0	0.1	N	4	6	Y	13
0	1	0	3089	0	47.8	3.7	0	0.1	N	2	6	N	0
0	18	0.275	6010	281	44.7	3.3	0.08	0.05	N	3	8	N	96.5
48.4	33	0.94723	N/A	14	N/A	N/A	N/A	N/A	N	1	6	Y	63.5
43	199	2.477036	1590	243	32.4	9.9	0.8	0.1	Y (Cereals)	N	0	N	0
50.7	67	4.11527	9102	90	47.8	5.9	0.1	0.3	Y (Cereals, in the Area 14000)	N/A	N/A	N	63.5
22.2	30	0	1093	15	32.1	17	0	0	Y (Cereals)	3	8	N	0
0	1	0	N/A	9	N/A	N/A	N/A	N/A	N	N/A	N/A	N	0
33.8	3	0	1199	2	25.8	4.4	0	0.4	N	5	15	N	0

in R using the package soc.ca, which can easily accommodate NA values in the data input (Le Roux and Rouanet 2010).

The results obtained had a high level of inertia (79%). Rather than employ the traditional biplots familiar with CA and MCA (Figs. 12.17 and 12.18), a moonplot (Fig. 12.19) better conveys the results of the analysis in accordance with the intuition behind the use of CA/MCA (https://github.com/Displayr/rhtmlMoonPlot). The moonplot shows the relationship among the individual site-phases within the circle, with site-phases located further from the center having greater discrimination from the group. Those closer to the center are less distinctive. Meanwhile, the individual site-phases that are found closer to one another have more similar row profiles, depending on whether they are more distinctive (further from the center) or just as distinct, with different attributes. Finally, the factors are found on the outer rim, shown in greater or smaller size depending on their importance.

It can be noted that factors that are located 180 degrees opposite one another show a negative association, as, for instance, whether or not there is a significant accumulation of plant remains. In the case of the setup of the variables of "Low," "Mid," and "High," these tend to be located at around 120 degrees of one another.

There are several noteworthy observations. First, among the site-phases, Marzuolo Phase 3 and Pievina Phase 2 stand out for their clear distinctive character, with Marzuolo Phase 2 at a slightly lower level, located towards the right-hand edge of the plot. It will be recalled that Pievina Phase 2 recalled most closely the canonical peasant "house," while the reoccupation of Marzuolo Structure 4 in Phase 2 looked likewise "domestic." Marzuolo Phase 1, Case Nuove Phase 2, Tombarelle Phase 1, and Podere Terrato can be discerned as a separate group, with different levels of attributes. All but Podere Terrato, it will be remembered, showed some level of agricultural or artisanal production. The small, short-term, non-production-oriented sites—San Martino, Poggio dell Amore, and Colle Massari—can be located toward the left-hand side of the center of the graph,

Table 12.4 Factors for each site/phase used in multiple correspondence analysis (SCE).

	Cer_Total	Cer_ Dining	Cer_ Cooking	Cer_ Storage	Cer_ Amphora	Faun_ Total	Cattle	Sheep_ Goat	Pig	Coins
PI 1	Low	Mid	High	Low	Mid	Low	Low	Mid	High	Low
PI 2	High	Low	Mid	High	High	High	Mid	High	Mid	High
CN 1.1	Low	Mid	High	Low	Mid	Low	High	Mid	Low	None
CN 1.2	Mid	High	Mid	Low	Mid	Mid	Low	Mid	High	Low
CN 1.3	Low	Low	Low	High	High	Low	Low	Low	High	None
CN 2	Mid	Mid	High	Mid	Low	High	Mid	High	Mid	Mid
SM	Mid	Low	High	High	Low	Low	High	Low	High	None
PA	Mid	Mid	Mid	Mid	Low	Low	Low	High	Low	None
CM	Low	Low	High	Mid	High	None	Low	Low	Low	None
PT	Mid	High	Low	Low	Mid	None	Low	Low	Low	Mid
MZ 1	High	High	Low	Mid	Low	High	High	Low	Mid	Mid
MZ 2	Mid	Low	Low	Low	High	High	Mid	High	Mid	Mid
MZ 3	High	Low	Mid	Low	High	High	Mid	Mid	High	High
TB 1	Mid	High	Mid	Mid	Low	Mid	High	Low	Low	None
TB 2	Low	High	Low	High	Mid	Low	Mid	High	Low	None
TB 3	Mid	Mid	Low	High	Low	Mid	High	Mid	Mid	Low
Method	IQR	Tercile	Tercile	Tercile	Tercile	IQR	Tercile	Tercile	Tercile	IQR

part of a rough grouping of the different subphases of Case Nuove Phase 1, Pievina Phase 1, and the later occupations of Tombarelle, Phases 2 and 3.

Reading the factors along the outside of the plot, there tend to be three groupings in which the variables of "High," "Mid," and "Low" appear to correspond, notwithstanding the factor in question. Those which rate as "High" tend to be located on the right-hand side of the circle, those as "Mid" on the upper left, and those as "Low" on the lower left. There are some exceptions within these overall patterns: for example, factors such as pig, cattle, and stone diversity vary from "Low" to "Mid" alongside "High" variables in other factors.

The label size of the factor labels also shows that the most important variables in determining group clustering are high levels of ceramics and animal bones, pollen from cereals, grape, and olive, as well as high levels of glass, metal, and coinage. As will be discussed more fully below, the evidence of coinage and metal finds related to craft production was equally influential when analyzing the small finds assemblage through non-metric multidimensional scaling, where both Marzuolo Phase 3 and Pievina Phase 2 again had the greatest amount of disassociation from the rest of the site-phases (Collins-Elliott 2018). Conversely, factors such as the dimensions of covered structures appeared to have little importance, and there did not seem to be a correlation with the number of types of building stone and the size of built structures. This can be borne out by returning to Table 12.3, where a site with a structure of 96.5 m^2 at Podere Terrato had just three types of building stone, Pievina Phase 1 (60 m^2) had six, and Poggio dell'Amore (13 m^2) had four. It is equally difficult to find correlation between the number of different building stone types and the maximum distance to the furthest building stone source.

The three different clusters indicated by the MCA warrant some comment. The first cluster may be characterized by site-phases with high levels of major domesticated plant taxa represented alongside larger amounts of ceramics, metal finds, glass, and coinage. This cluster includes Marzuolo 3 and

Metal	Glass	LPPI	Cereals	Vitis	Olive	Plant_Acc	Stone_ Diversity	Stone_ Distance	External_ Cook_ Storage	Structure_ Dim
Mid	None	NA	NA	NA	NA	NA	High	High	Y	High
High	High	NA	NA	NA	NA	NA	Low	High	Y	High
Low	None	NA	NA	NA	NA	N	NA	NA	N	None
High	Mid	NA	NA	NA	NA	N	NA	NA	N	None
Low	None	NA	NA	NA	NA	N	NA	NA	N	Low
Mid	Mid	Mid	Mid	Mid	Mid	Y	NA	NA	N	None
Mid	None	High	Low	Low	Low	N	Low	NA	N	High
Low	Low	Mid	Low	Low	Mid	N	Mid	Low	Y	Mid
Low	None	High	Mid	Low	Mid	N	Low	Low	N	None
Mid	Mid	Mid	Low	High	Low	N	Mid	Mid	N	High
Mid	Mid	NA	NA	NA	NA	N	Low	Mid	Y	High
High	High	Low	High	High	High	Y	High	Low	N	None
High	High	High	High	High	High	Y	NA	NA	N	High
Mid	None	Low	High	Mid	Low	Y	Mid	Mid	N	None
Low	None	NA	NA	NA	NA	N	NA	NA	N	None
Low	Low	Low	Mid	Mid	High	N	High	High	N	None
IQR	IQR	Tercile	Tercile	Tercile	Tercile	Y/N/NA	Tercile	Tercile	Y/N/NA	IQR

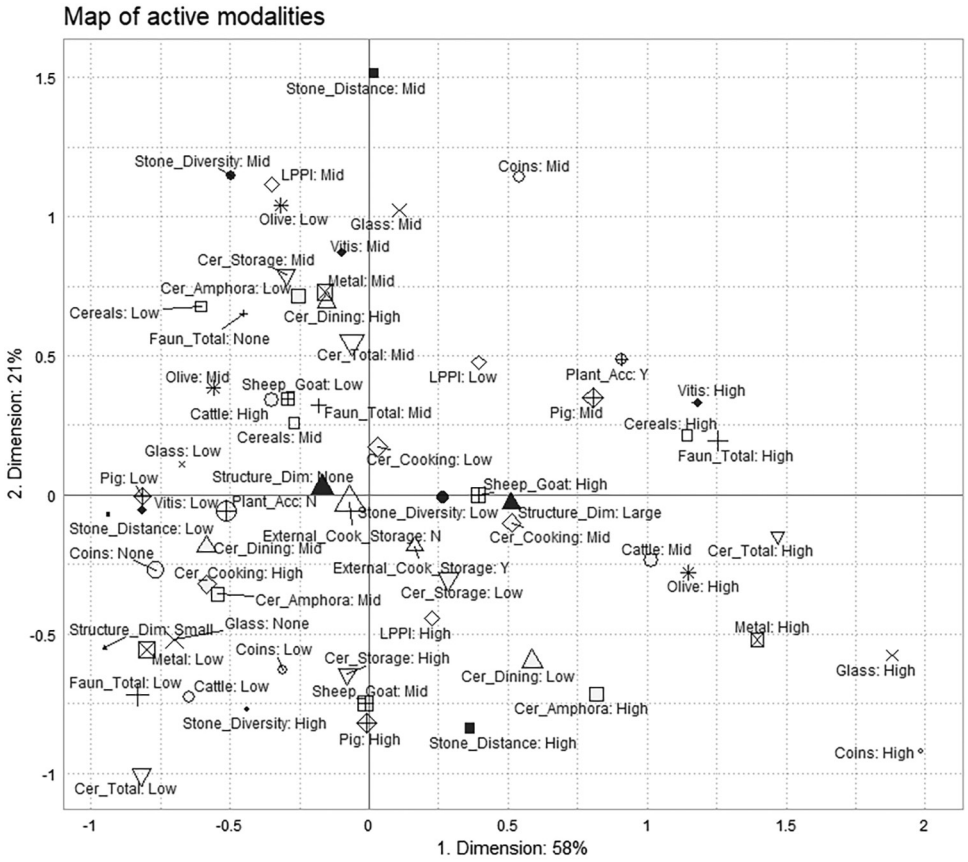


Fig. 12.17 Multiple correspondence analysis plotted a biplot for all data categories, all sites. See Table 12.3 for data sources (SCE).

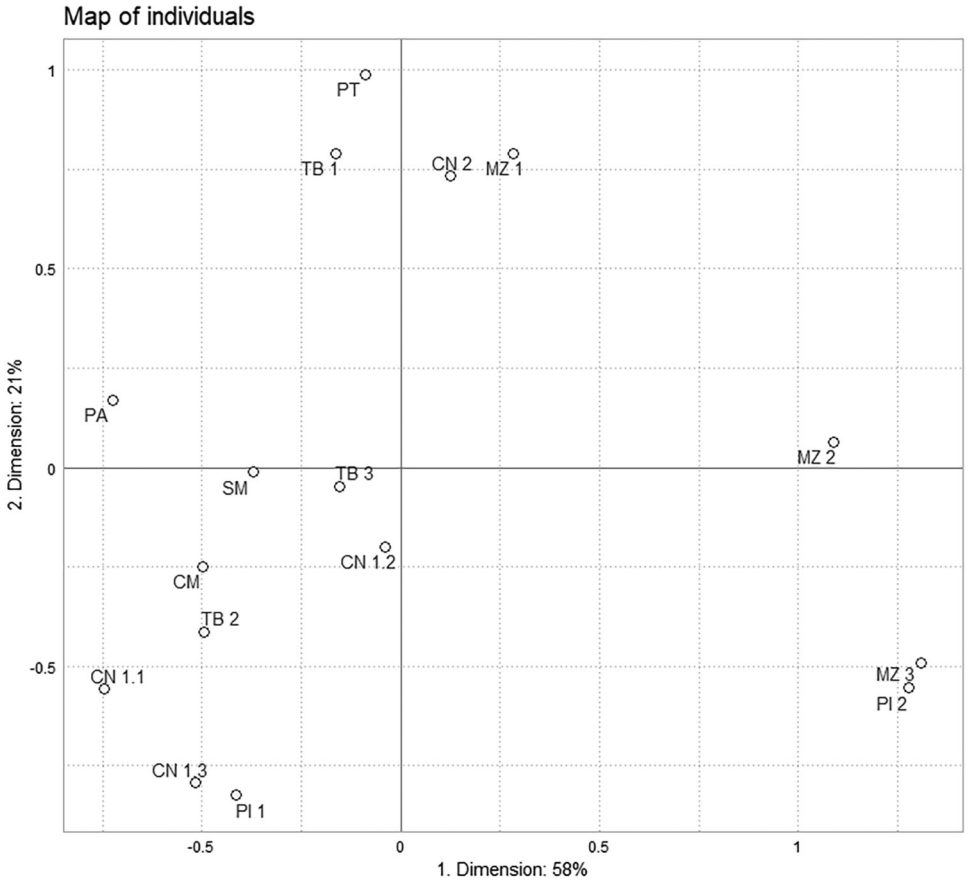


Fig. 12.18 Multiple correspondence analysis plotted on a biplot for grouped data from all sites. See Table 12.3 for data sources (SCE).

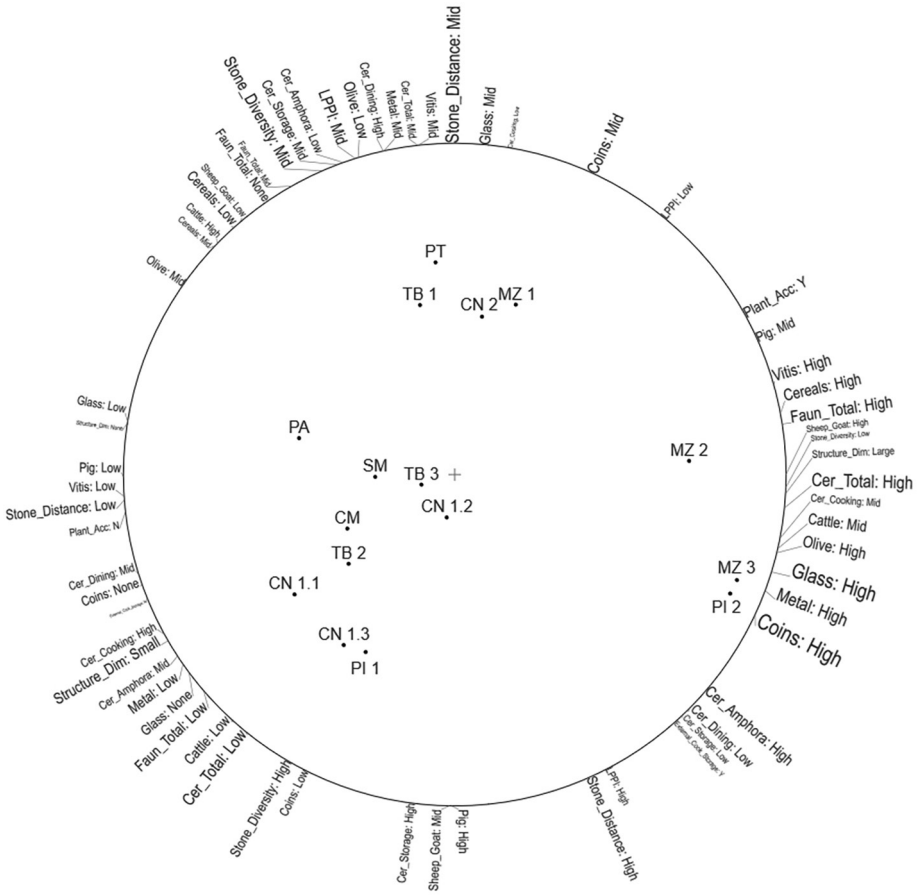


Fig. 12.19 Multiple correspondence analysis plotted as a moonplot. See Table 12.3 for data sources (SCE).

Pievina Phase 2, and to a lesser extent Marzuolo Phase 2. These site-phases, while high in the overall counts of faunal remains, nevertheless have only moderate amounts of cattle and pig, yet higher levels of sheep/goat. While Pievina Phase 2 and Marzuolo 3 happen to be sites where there were large, covered structures, as described above those factors were not as influential in determining their distinctiveness as the finds assemblages and plant and animal remains. In a sense, the organic and artificial finds data are more important than the architecture in defining this cluster.

The second group of sites includes those which have moderate levels of ceramics, metal, coinage, glass, and faunal remains, low levels of olive and cereals, yet high levels of ceramic tableware. These sites include Podere Terrato, a site which had a small find assemblage marked by a prevalence of personal objects, as well as Podere Marzuolo Phase 1, Tombarelle Phase 1, and Case Nuove Phase 2. The presence of coinage plays an important role in the association of these site phases, with the diversity and maximum distance of building stone types a concomitant, rather than crucial, factor.

The third group consists of the small, seemingly sporadically occupied sites like Poggio dell'Amore and San Martino, as well as Colle Massari, Case Nuove Phase 1, Pievina Phase 1, and the later phases of Tombarelle. This group tends on the whole to be less distinctive than the first two groups, both in terms of the site-phases (clustering toward the center of the plot), and in its variables, which consist of values of "Low" or "None" in several factors, such as the total ceramics, animal bones, coinage, metal, and glass, as well as pig and cattle. The factors that score as "High" are ceramic cookware and diversity of building stone.

Evaluating the "domestic" nature or function of sites requires a degree of nuance and qualification, as this varies with respect to the architecture of the site, the finds assemblage, and the perceived longevity of use of the structure. In terms of buildings, sites

can be divided into several groups such as the small single-room structures of San Martino and Poggio dell'Amore, multiroom structures such as Podere Terrato, and larger, long-term complexes like Pievina and Marzuolo. What set these site-phases apart according to the MCA biplot, however, are not so much their built spaces, but rather the composition of the material and organic assemblages, which attest to the sum of activities that transpired within and around the areas of excavation.

Alongside the use of MCA to cluster site-phases and evaluate the importance of different factors in the distinction of those clusters, another method of multivariate analysis was also developed for the small finds assemblage in order to assess the prevalence of different social domains in the landscape of the *comune* of Cinigano, as attested by the sites excavated. This analysis involved creating a map of the different potential semantic associations that an object could have, in a formal ontology whose structure can be designed at any level of complexity. Two sets of analyses were run: one used a broad, highly connected semantic graph, relating small finds to the total range of potential activities and domains (Collins-Elliott 2018), and the other used a more constrained set of associations between artifact and activity as indicated by the smaller number of linkages in the semantic graph (Fig. 12.20). The results using either of these ontologies showed generally the same picture. Since the object here was to see whether the late Republican/early imperial or late antique periods might find more or less diversification in site-types, we used non-metric multidimensional scaling (nMDS) to plot the site-phases, and then calculated the average of the Euclidean distance between each site-phase. The results suggested that late antiquity, overall, had greater variety in site-types, even when there were a smaller number of site-phases used (only four: CN2, MZ3, PI2, and TB2, versus nine for the earlier group: CN1, MZ1, MZ2, PA, PI1, PT, SM, TB1, TB2) (Fig. 12.21). That said, the site phases that were on the periphery of the nMDS plot were PI2, MZ2, and MZ3, which ranked high in indices of exchange and craft production, compared to the range of the rest of the site-phases, most of which lie in the bottom-left space of the MCA moonplot above.

The use of a semantic map arose in response to the shortcomings of one-to-one relationships of finds definitions to activities and domains of behavior. Originally, finds were coded with a three-letter abbreviation, based on *Artefacts, Encyclopédie en ligne des petits objets archéologiques* (Feugère 2010), which were then recast directly into their corresponding activity or domain (Collin-Elliott 2017). Then, using this reclassification, one early analysis sought to assess the effects of sample size on the resulting associations by using the bootstrap, which consists of sampling with replacement using the same sample size. Using the bootstrap on MCA, with qualitative data, is not pragmatic, but it is feasible with CA, which uses scalar values (Greenacre 2007:193–197). The result is a biplot which shows convex hulls according to a confidence level (here, 95%), thereby indicating whether different factors might overlap owed to sample size.

Looking first at the 2nd c. BC to 1st c. AD sites (Fig. 12.22), the resulting plot sees two major clusters, an association of the factors based on finds related to infrastructure and craft production/craft discard in the center of the biplot, while the other factors do overlap, although with some distinction between exchange-related and personal finds on the one hand, and more generic finds (economic, domestic, and agriculture) on the other. There is nevertheless some distinction in terms of the associations of the activities in this period.

For late antiquity, the activity profiles from the three sites of Pievina, Case Nuove Phase 2, and Marzuolo Phase 3 differ far less (Fig. 12.23). Domestic life and agriculture overlap slightly and are separated somewhat by exchange, but the other domains are indistinguishable from one another, pointing to a change from the late Republican period. The use of the bootstrap, therefore, allows for a nuanced picture in terms of the confidence of the associations, but it is nevertheless based on the essential classification of the finds as indicators of one, and only one, activity or behavior. All the same, the gulf in the habitual landscape between the late Republic and early empire, and late antiquity, is clear. In terms of interpreting the significance of that change, multivariate data analysis allows us to harness several different factors at once, in order to establish what those differences are, as well as their degree. It should be self-evident that the choice of factors and how variables are constructed matters for the conclusions drawn, but this is the case whether one is focused on one class of factors or several. In providing a succinct picture for the way in which behavior changes in the Roman countryside, exchange mechanisms and craft activity appear to be

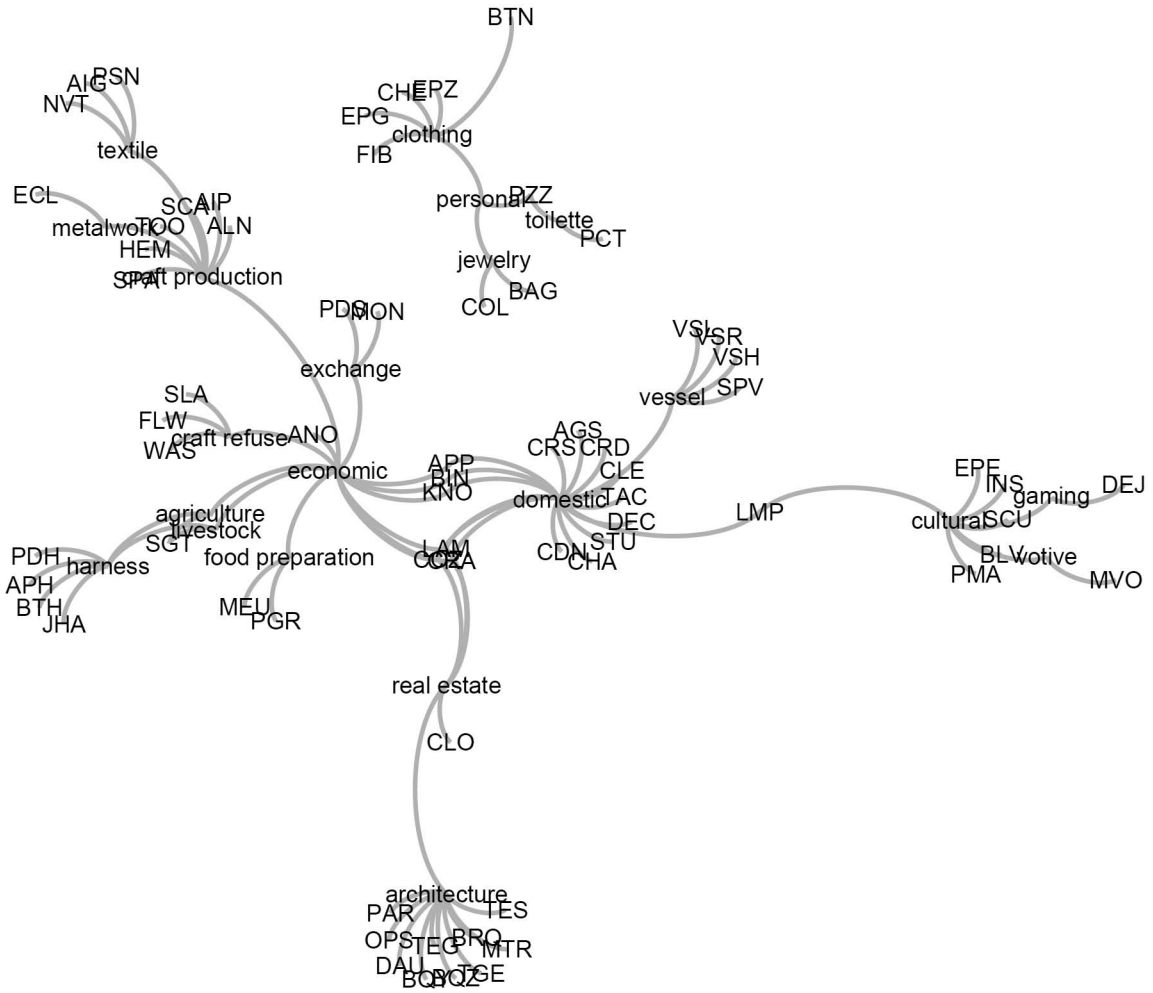


Fig. 12.20 Graphic representation of broad ontologies connecting object type and function (SCE).

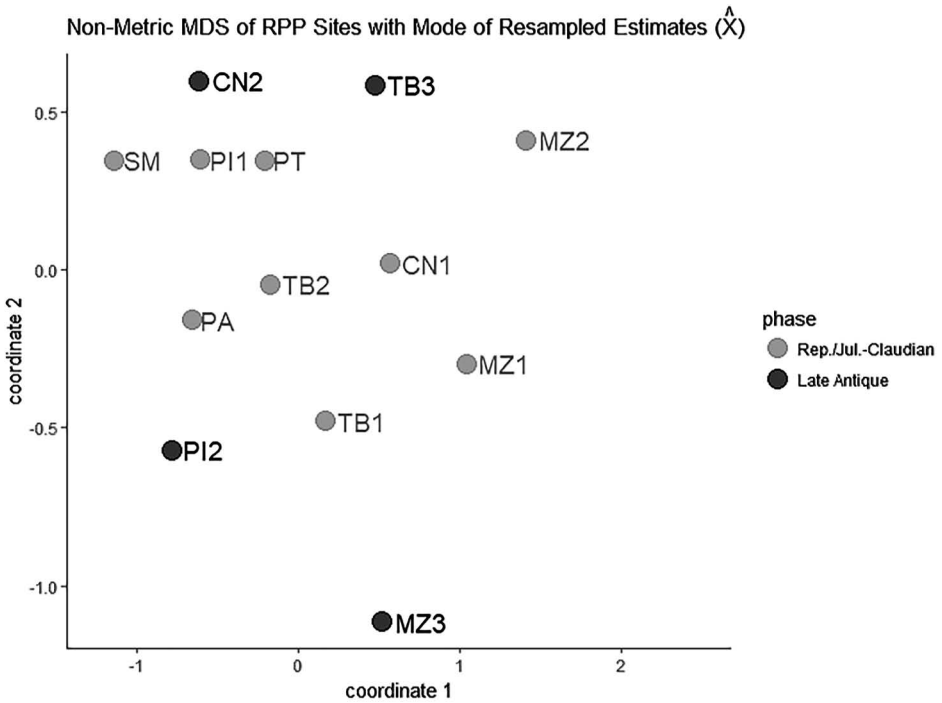


Fig. 12.21 Non-metric multidimensional scaling (nMDS) analysis of small finds from project sites, using broad ontologies shown in Fig. 12.20 (SCE).

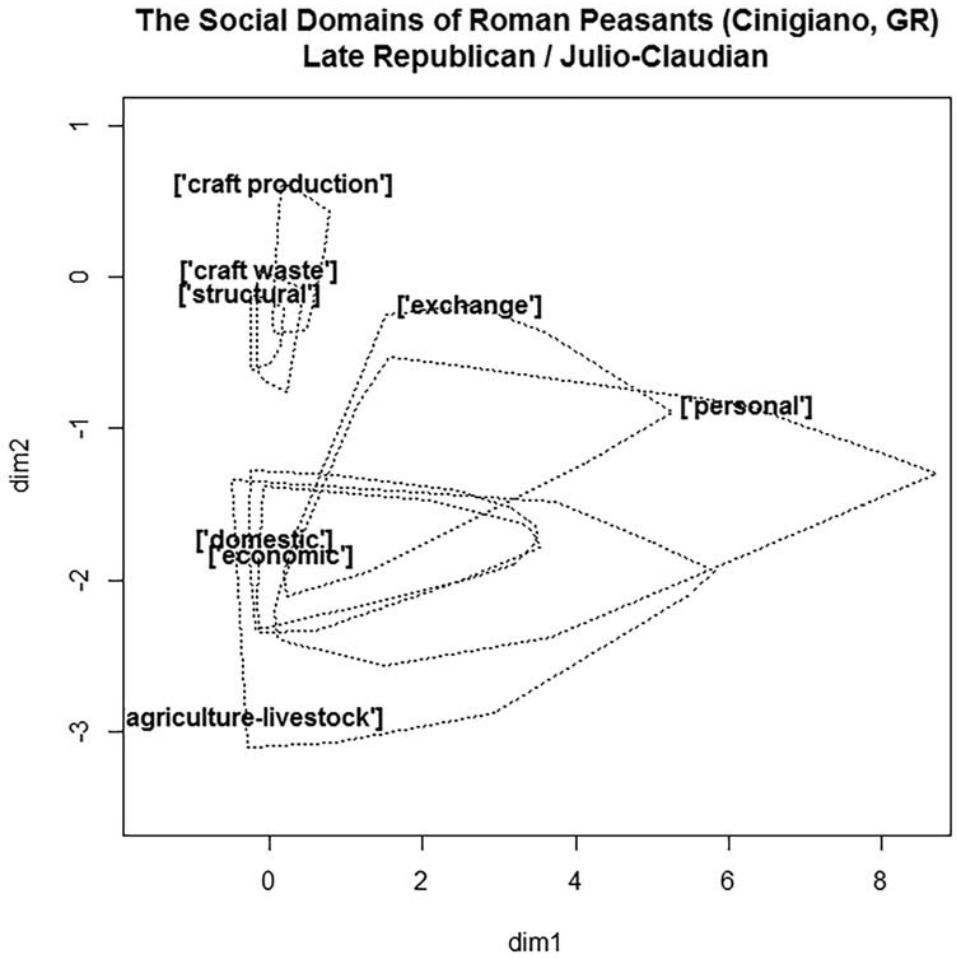


Fig. 12.22 Correspondence analysis using the bootstrap of domains based on one-to-one relationship with small finds, plotted as convex hulls for late Republican/early imperial sites (Pievina Phase 1, San Martino, Case Nuove Phase 1, Poggio dell'Amore, Podere Terrato, Marzuolo Phase 1, and Marzuolo Phase 2) (Collins-Elliott 2017).

the most significant. This is clear not just in the comprehensive MCA plot of the entire array of site features and finds, since, in the nMDS plot, site-phases with the highest amounts of coinage and small finds related to those domains are the most distant from the densest part of the cluster of site-phases.

12.6 Distributed Habitation and the Temporal Spectrum (KB)

Rather than an area dominated by an array of canonically defined peasant houses, the project has instead revealed a wide range of heretofore under-noted spaces, where other aspects of household life took place. As the above MCA shows, these spaces were somewhat specialized by activity and were distinctive largely due to their finds assemblages. In other words, rather than simply households stationed in polyfunctional house/farm sites, the data posits a range of habitation, characterized by *both* these previously known site types, *and* a whole range of more specialized sites. We have noted above that in the canonical Roman peasant house, different activities were not necessarily assigned their own spaces within the house structure. Our data has offered a potential explanation for this phenomenon by locating those separate activities outside these houses, in a constellation of specialized sites set throughout the locale.

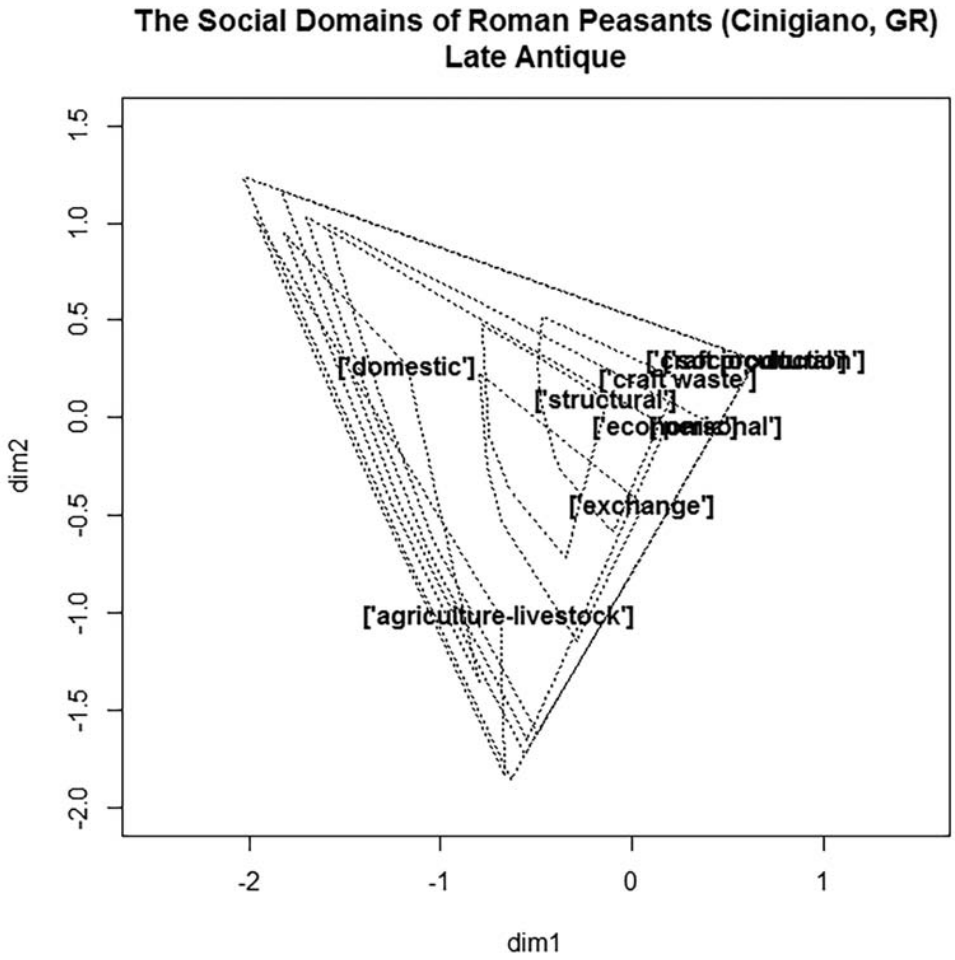


Fig. 12.23 Correspondence analysis using the bootstrap of domains based on one-to-one relationship with small finds, plotted as convex hulls for late antique sites (Pievina Phase 2, Case Nuove Phase 2 and Marzuolo Phase 3) (Collins-Elliott 2017).

The closest example we have to the canonical polyfunctional house/farm is Pievina Phase 1, which appears to reveal a larger, more complex version of the form. Here, if we are correct in assuming that the habitation area lay unexcavated to the N, the excavated portions included the specific functional installations of granary, kiln, and cistern. Rather than the "villages" presumed by field survey, multicluster scatters like Pievina may represent the centralization of some of these specialized functions in a single site—something like the canonical "farm," or better, a kind of central dwelling.

But even the household at Pievina I may have had activities it carried out away from its "central dwelling." The other sites found in the project—presses, temporary stabling points/work huts, ceramic factories, drained pastures—all represent the household activities flagged by Wilk and Rathje—agro-processing, animal husbandry, cultivation, artisanal production—but, in this case, located away from the central dwelling. These sites represent what we term "distributed habitation," aspects of household life which are distributed throughout the landscape and which represent specialized activities placed in particular and diverse points in the locale (Fig. 12.24).

These heterogeneous activity spaces—different in function—must have been linked by the activities and movements of the peasant household itself. That is, what is implied by distributed habitation is household members that moved around, using different

sites in complementary fashion to fulfill the various functions that constitute Wilk and Rathje's notional construction of the household. The Case Nuove pressing site, the San Martino and Poggio dell'Amore stabling points, the Marzuolo ceramics factory, none of these sites stand on thier own. Rather, they presuppose people on the move, making use of these sites as part of a spectrum of such sites used in the course of a household's daily, seasonal, or yearly activities.

We need not imagine that each site reflected or was tied to a specific household, and it is, in any event, impossible to excavate the proprietary or familial relationships between them. In some cases, however, we have certain indications. Pievina Phases 1 and 2 seems to have been a more permanent site for a whole household; the Case Nuove pressing site and Marzuolo kilns were almost certainly used by multiple households. The stabling points San Martino and Poggio dell'Amore could be shared or proprietary to a single house: given their size the latter seems more likely, although were pastures used communally, as may have been the case in other parts of the Roman world, they could be shared (Oosthuizen 2013; cf. Koster 2000). The locale dominated by distributed habitation resembles in its most basic form a network in which distributed sites are linked to central dwellings, some individually, some communally as represented in Figure 12.24. We will take this issue up again in Chapter 13 discussing agricultural strategies.

Distributed habitation carries a number of temporal implications, a spectrum of time as well as space and activity as represented in Figure 12.25. Not only were many of these specialized sites in use for short periods of time, i.e., a generation or less, but their functional specialization implies a spectrum of activity-time, from the daily to the seasonal to the occasional. Case Nuove Phase 1 would only have been used in late summer and late fall, the times of the grape and olive harvests respectively; Marzuolo Phases 1 and 2 would have been populated as both a purchasing and employment site principally in the spring and summer months, when both ceramic manufacturing and travel was more feasible. Its intensive grain production, another summer-oriented activity, would have taken place simultaneously. At the other end of the spectrum is Pievina Phase 2 with its material culture for daily, year-long activities like cooking, stock rearing and personal adornments of daily life. As we shall see below (Ch. 13), certain agricultural activities clung to certain types of sites, those activities carrying with them their seasons of seeding and harvest. The project data bring out the importance

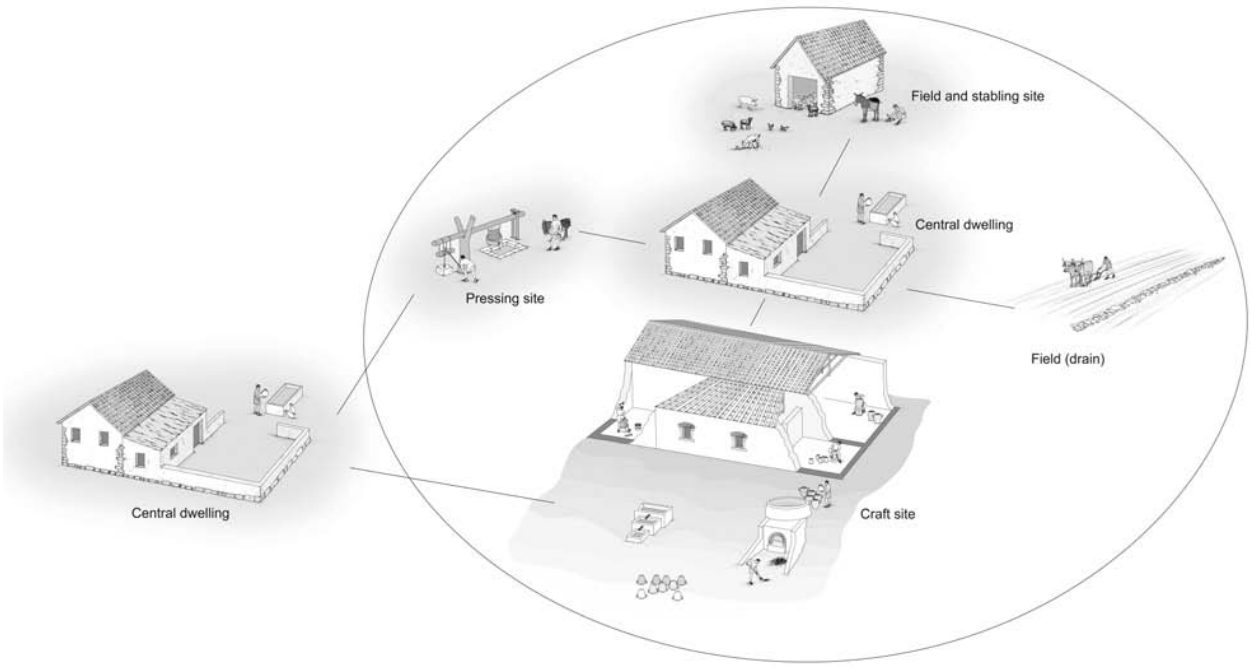


Fig. 12.24 Diagram of distributed habitation (Matilda Grimaldi).

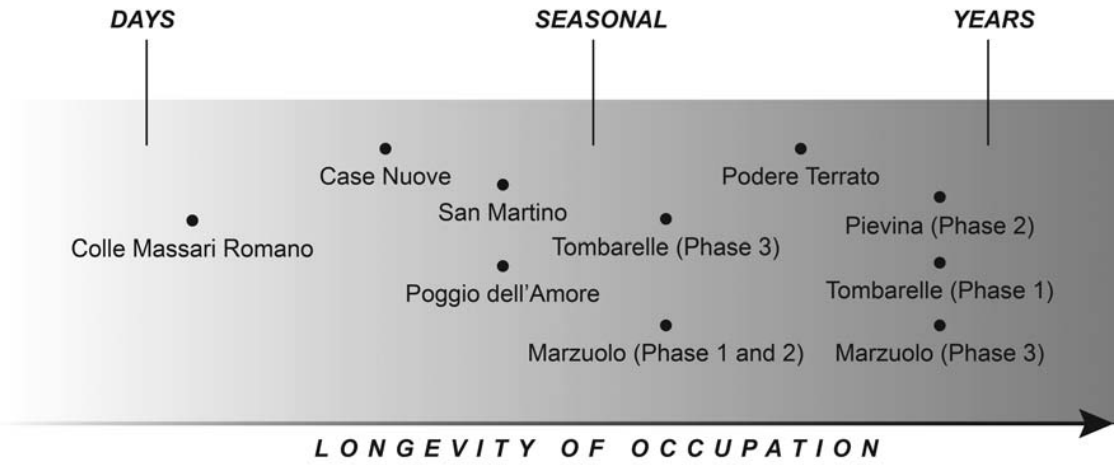


Fig. 12.25 Diagram of spectrum of habitation, with project sites mapped against hypothetical use periods (Matilda Grimaldi).

of this range of times and particularly the degree to which short-term activity might be given nearly the same material expression, entail similar investment, and loom as large in the archaeological record, as the *longue durée* (cf. Foxhall 2000).

12.7 Distributed Habitation in Context (KB, CG)

This distributed habitation system implies a more complex notion of "living" than Garnsey or Roman archaeologists have formerly envisioned. In framing his question around "living," Garnsey, and the field more generally, have naturally imagined a singular locus of domestic life—the house—with possible movement to and from agricultural fields. Our area not only embodies a more complex model of movement than Garnsey's sedentary/commuting binary, it also posits a somewhat different sense of what we mean by "living."

We should note that while our project only found one or two examples, there were doubtless more habitation bases—house sites in which households spent the majority of their time and many of the activities defined above as "domestic" took place. At the same time, these same households spent time in a range of other spaces. This is not commuting as Garnsey intuited from modern ethnographic comparisons, with a fixed village house and a fixed extra-village plot of land. Instead, this mobility is defined by more fine-grained activity separation, with pressing, stabling, and certain types of craft manufacturing being set in their own distinct spaces, while other sites have more typically "domestic" activities. Mobility thus described is both task-oriented and seasonal, rather than being defined solely by quotidian rhythm around agricultural fields.

This trend and the movement between sites it implies should not be equated with nomadism, defined as the lack of a settled home by households who move to follow resources—be these edibles, fodder, or customers. Rather, this distributed habitation implies almost the opposite—building permanent points to solidify activities in particular places, and to anchor those activities within the landscape, thereby producing a physical instantiation of a "taskscape" (Ingold 1993). This amounts to a kind of doubling-down on the space/activity matrix, not only providing specialized activities their own space but giving those activities their own material marker, despite the seeming short-term or seasonal nature of some of these activities. The project data describes a world less defined by a nomadic/sedentary binary, than by a highly mobile Roman world in which people were constantly on the move (cf. Osborne 1991; Foxhall 2000 and Ch. 17 in this volume).

Our employment of the terms "dwelling" and "taskscape" in the preceding paragraphs signal that, in our construction, these different "habitation" activities are always embodied spatially (Ingold 1993;

Thomas 2008). For Ingold, all activities are "the constitutive acts of dwelling" (Ingold 1993:158). Doing things in space brings space into being and the space-activity matrix is embodied with the resultant taskscape. The distributed landscape we have observed here is a particular material expression of this principal: Roman peasants in the locale not only do things in their taskscape, as we would expect, but they separate those tasks in space according to the nature of the activity and give material expression to those specialized activities. As will be discussed in Chapter 17, it is this practice which colors the very nature of the locale itself and is a particular reminder that Roman landscapes were not canvases but were constituted very particularly by the activity of living.

Rural dwellers past and present have used different strategies of movement to exploit distant resources. Hunter-gatherers in the Arctic or Amazon (Binford 1980), sedentary peasants in northern Mexico (Hard and Merrill 1992) and 18–19th c. peasants in Provence (Specklin 1976:270; Mansuy Chevalier-Drevon 1994) and Greece (Wagstaff and Augustson 1982; Clarke 2000; Forbes 2007), adopted not dissimilar strategies for distributing their household in more or less permanent activity bases throughout the landscape. Whether the whole household moves together (Binford's "residential" moves) or only specific members move ("logistical" moves), temporary dislocation from the central habitation to distributed resources—from fields and hunting grounds to markets and ritual sites—and a consequent dynamic, distributed kind of habitation seems a historically recurrent strategy. In instances where resources are highly distributed and the desire to manage these resources is strong, even logistical movement is supported by temporary structures. The 18–19th c. Provençal *bories* with their vaulting of drystone masonry (Mansuy Chevalier-Drevon 1994), the Greek *kalivia*, small stone structures for overnight stays, threshing and grape pressing (Forbes 2000b, 2007:185), even the early modern stone shepherd's huts of subalpine Italy (Migliavacca, Saggiorno, and Sauro 2013) all show the same the tendency to build robust, sometimes even monumental structures for temporary, episodic use. That Roman peasants, members of a monument-*habitus* culture, should do so is hardly surprising.

Nonetheless, distributed habitation confounds many of our expectations of the "house," both generally (cf. Hodder 1990) and in the Roman world. Roman writers from Cicero to Pliny describe their houses as seats of memory where the *lares* and the *imagines* of the ancestors marked multigenerational time. As recent work has noted, real Romans rarely had such long relationships with specific houses: a vibrant property market, a tendency to own multiple residences, and moves occasioned by marriage and inheritance meant that even elite Romans who might speak, like Cicero, of their home as an ancestral dwelling, were in reality often on the move (Bodel 1997, 2008; Hillner 2003). The peasant house, particularly the peasant distributed house, confounds expectations of permanence still further. In use for a season or a generation, many of the structures revealed by the project seem almost disposable, precocious rather than perpetual. This distinct *lack* of permanence provokes, indeed begs, further questions about the temporal scale at which we should analyze the populations that dwelled in these structures, and about their seeming permanence in this landscape (cf. Chs. 17 and 18, and below).

The phenomenon also demonstrates notable differences with Roman villas. Villas, almost by definition, serve as centralized places for storage, agro-processing—wine and oil pressing, animal stabling and storage—as well occasional small-scale artisanal activity. Peasant distributed habitation, on the other hand sees some or all of those productive processes distributed around the locale, rather than concentrated at the central dwelling. There was almost certainly a spectrum of such distribution: farms like Pievina 1 have more of these functions at the central dwelling, while Podere Terrato, assuming it is a central dwelling, had no agro-processing facilities. Rather than being miniature versions of Roman villas without the frills, distributed peasant houses might manifest a range of very different spatial articulations of productive space.

12.8 Implications for the Roman Agrarian Landscape (KB)

We have been speaking here of a "phenomenon" of distributed houses. But how much of a phenomenon was it? Was it used by peasants outside the project area? The admittedly problematic evidence of the field surveys suggests it may extend to other

central Italian regions and perhaps beyond. A dramatic increase in small surface scatters from the 2nd through the 1st c. BC has been noted in many surveys of central Italy (Launaro 2011). The smaller of these scatters were those which, in our area, tended to be specialized distributed activity sites. Whether the "small sites" of these other surveys, whose smallness and morphology are defined differently in each survey (cf. Witcher 2006b, 2012), correspond to our specialized distributed sites, is unknown and would have to be tested through excavation. On the whole, however, it seems likely that in at least some regions, these "small sites" might be distributed specialized sites of the kind we have found.

The tendency for Roman farmers of all statuses to diversify their landholdings, and to make specialized use of different plots of land has long been known (Cic. *Rosc. Am.* 7.20; Plin. *Ep.* 3.19.2; Vera 1986; Capogrossi Colognesi 1986; Garnsey 1988:47–50). Indeed, geographers and anthropologists have long noted that land fragmentation is a universal trait of nearly all agricultural systems, historical and social circumstances determining the size, separation distance, and management of multiple plots (Bentley 1987). The range of Mediterranean microlocales, each of which has highly diverse soils, rainfall, sunlight, and other variables, makes this a sensible strategy not only for risk mitigation, as Forbes and Gallant have emphasized (Gallant 1991; Forbes 2007), but also land optimization (Gault 1979; Horden and Purcell 2000:77–79). Indeed, recent Italian field survey projects have begun to consider the penumbra of small scatters around larger ones as representing productive satellites or intensive land use around those sites (Haas 2011, 2012). A decade ago, Ikeguchi (2006) actually proposed that the smallest sites from survey represented agricultural installations, much as we have found here.

In a sense, the distributed habitation pattern noted in this project is simply an intensification of this practice: not only were small-scale agriculturalists making use of diverse plots for different purposes, but just as importantly, for a period during the 2nd c. BC through 1st c. AD they gave that use built expression and an infrastructural footprint, constructing drains, presses, stables and the like to render the exploitation of different plots most efficient. In short, and as will be analyzed in more detail in Chapters 13 and 15, what we have termed distributed habitation may represent a moment of intensive agricultural and artisanal exploitation by smallholders.

Despite the long-recognized phenomenon of land fragmentation and some acknowledgement of its archaeological knock-on effects, both field survey and recent work on rural demographics have largely ignored its implications. As described in Chapter 1, Italian field survey has largely assumed that different scatter sizes correspond to different kinds of houses, villas and farms particularly. As surveys have classed different sized scatters variably (see Launaro [2011] for an overview), what counts as a "farm," a "house/hut," or other category therefore is not equivalent. Nonetheless, no survey has taken seriously the notion that the smallest category of scatters might not be houses, but something else. Given that scatters under 0.5 ha form the majority of all scatters in the late Republican/imperial phases of most central Italian surveys, this assumption is an important one. If, as we suggest here, many such scatters may not necessarily represent "farms" or "houses" but, rather, components of a distributed habitation network, the historical significance of these functional categories must be reexamined.

Interpreting the survey data with reference to a distributed habitation model has most significant implications for the discourse around the "death of the peasant," a phenomenon that is typically tracked through the numeric rise and fall of these small scatters. If, as we suggest here, some of these smalls scatters represent specialized agricultural installations, the expansion and contraction in their numbers amounts to a change in both the nature of dwelling and the intensive agricultural practices that accompanied it. It need not necessarily follow, however, that these changes in agricultural practice among smallholders were accompanied by changes in the number of smallholders themselves in these landscapes.

The demographic estimates that have derived from these field survey categories are, thus, in need of reconsideration. The renewed interest in Roman demographics spurred first by the work of Scheidel (2001) and then by the New Institutionalist Economic project more generally has turned to archaeology in hopes of resolving the seemingly irreconcilable debate over the demographics of Roman Italy between the middle Republic and the high empire, which opposes a "low-count" of ca. 5–7 million and a "high-count" of 14–20 million. Witcher, Fentress, and Launaro have

all produced estimates based on field survey data, all of which assign population numbers to small scatters on the assumption that they represent farms or other kinds of houses populated by families (Fentress 2009; Launaro 2011; Witcher 2011). If, as we have proposed, the smallest of these scatters do not necessarily represent distinct centers of population, but rather sites used by people located in other, probably larger scatters, these numbers should be all adjusted downward: some 13–15% if their number of "farms" is halved.[6] Regardless, the possibility that so many of these small scatters represent non-habitation sites adds further support to the long-standing chorus of doubt about the capacity of field survey to tell us anything about demographics (Bintliff 2002; Osborne 2004; Scheidel 2008; Ligt 2012:265): that chorus has largely focused on the "missing" sites from survey, but we should now add doubt about what the sites we do have actually represent. The extraordinarily short-term occupation of so many of our sites, together with an imperfect knowledge of the duration and/or variation in the use-lives of the ceramics represented in any surface scatter, likewise suggest that current methodologies for deriving notional, chunked periodizations of settlement are in need of revision.

The recognition that central Italian surveys are registering changes in land management practices as much as "settlement" also makes it difficult, if not impossible, to estimate estate or plot size. Increasingly sophisticated attempts have been made to use surface data to weigh in on the similarly vexed question of the size of peasant holdings. Distributions to veterans as colonial allotments are thought to provide a reasonable proxy for what was "normal" for peasant plots sizes in Italy. The textual sources for these allotments give sizes of anything between five and 50 *iugera* (Brunt 1975:623; Duncan-Jones 1976; Goodchild 2007:85–87). These figures have been further extrapolated to a "norm" of anywhere between two to sixteen *iugera* (0.5 to 14 ha [Goodchild 2007:78–120]). If, by contrast, fragmented holdings are the norm, and distributed habitation and its concomitant small scatter plots represent a moment of doubling-down on this pattern of fragmented holdings, the density of surface scatters is almost useless as a proxy for estate size. How to determine if a kiln or press or stable belongs to one central habitation or another or is even shared by several? The uncertainties multiply in what is already a cascade of assumptions.

If distributed habitation can at least be posited, on the basis of the survey evidence, as an important part of some central Italian landscapes, what about beyond? The large-scale surveys and rescue excavations in Languedoc and perhaps in Provence (i.e., the province of Gallia Narbonensis) may have revealed something similar. Careful analysis of survey data combined with large-scale excavations have suggested that many of the smallest surface survey sites should be identified as short-use, agrarian structures or temporary habitation. These comprised some 42% of all sites from one survey area (Favory and Raynaud 2000). Large-scale excavation of the less numerous, larger sites, ranging from 2,700 to 4,500 m^2, have revealed further details about their activity profile (Bérato 2009; Raynaud 2009). The larger of these have hearths, dolia and large quantities of domestic rubbish and seem to be more permanent farmsteads. Others, often but not always smaller, lack these features and have other elements—broad doorways, large yards, presses—that point to stock yards/stabling points or other kinds of agricultural installations. The chronologies are somewhat later in keeping with the different Roman histories of that region, but the morphology and complexity spectrum of the more permanent spaces and the simultaneous presence of separate, specialized sites seems analogous to the spaces we have identified in our area.

Whether the phenomenon extends beyond these provinces is less clear: ever more detailed study of Roman rural landscapes, particularly sites beyond villas, has revealed a marked variety in chronological, morphological, and functional characteristics between regions and even sub-regions. The notion of "a Roman landscape" is giving way to a profound regionalism.

The best studied of these regions/provinces, Britain, now boasts some 2,700 excavated rural sites of all kinds, many of which have been found through the function-neutral agency of rescue excavation. Tellingly, only a handful of distributed activity sites have been found. Rather, the enclosed (ditched) or unenclosed farm complete with stables, storage, and other agro-processing facilities seems the norm for peasant habitation there (Smith et al. 2016).

Northern and central Gaul, too, has seen the same kind of large-scale rescue excavation work and likewise sees a landscape dominated by peasant dwellings (Reddé 2016b). These peasant habitations,

however, are of diverse kinds, none of which really resembles the distributed habitation we have identified. Like Britain, ditched, nucleated farmsteads are the norm and where large-scale work has exposed their variety, they appear along a spectrum from 1,000 m^2 to several hectares in total area—roughly analogous to the Pievina Phase 1 scatter. One detailed study from the Plain de France found a high density (1.5/km^2) of these farms, the majority of which were long lived and rich in material culture (Ouzoulias and Van Ossel 2009). Another study in the Haye forest in northern Gaul found a short (1st–2nd c. AD) moment of agricultural intensification, not unlike ours, but managed through a high density of ditched farms, drains, terraces, and heavy manuring (Ouzoulias 2014). Again, impressions of relatively homogeneous patterns of residence and/or exploitation derived solely from survey data take on considerably more complexity when coupled with excavation. The resulting picture is of a collection of highly specific locales, characterized by particular combinations of geography and climate, socioeconomic and cultural expectations, and structures.

One other reason to expect that distributed habitation is not universal is its highly periodized character, even within our area. Our data tentatively suggest that distributed habitation may be limited to the 2nd c. BC through the mid- to late 1st c. AD. The network of specialized site types and the spatial separation of tasks seems to be a phenomenon of the late Republic: none of the small, short-term specialized sites except Case Nuove outlives the empire. The small-scale repopulation of sites in the 5th c. AD—Case Nuove, Pievina, Marzuolo and Tombarelle—are, with the exception of Case Nuove, rather different in character. While the CA and nMDS analysis is ambiguous in this regard, the nature of the "house" site at Pievina and the reoccupation of the artisanal site at Marzuolo suggests a concentration of all activities in the same space, rather than a reactivation of the older system of multiple activity spaces. Much has been made of the field survey evidence for a small demographic resurgence in some parts of the central Italian countryside during this period (Patterson, Di Giuseppe, and Witcher 2004; Vaccaro 2008). The project's data suggests that while some sites may have been repopulated, the household and its relationship with the surrounding locale may have changed. We will discuss the reasons and implications of this marked periodization in the concluding chapter.

NOTES:

12.1 The only analytical survey of the corpus is by Rathbone (2008), which misses some important recent excavations.

12.2 To this list should also be added the fragmentary remains of such peasant houses beneath the later villa phases at the Serchio River near Lucca (Ciampoltrini and Zecchini 2005).

12.3 The richest published data come from Monte Forco, Farmstead 9 at Luni, Podere Tartuchino, and Podere S. Martino.

12.4 e.g., Podere S. Mario, Podere Cosciano.

12.5 It is possible that sites involved in production were preferentially selected by the project for excavation as noted above.

12.6 Numbers are taken from Fentress (2009: table 5.2), Witcher (2008:293), and Launaro (2011: table 6.1) (a -36%Δ from his +34Δ for farm number changes from the late Republic to early empire). For -50% of farms, overall population should change as follows: Witcher -13%; Fentress -15%, Launaro -20%.

13

Agriculture and Land Use

Antonia Arnoldus, Kim Bowes, Michael MacKinnon, Anna Maria Mercuri, Eleonora Rattighieri, and Rosella Rinaldi

Rural dwellers' relationship with the land is an intimate one, and of critical importance in any study of their lifeways. The RPP was developed to understand humans and landscapes as parts of a unified system, and, thus, agriculture and land use were the focus of particular study. We were interested in the complementary use of the land in different parts of the study area, the technologies used in cultivation and processing, and where possible, an understanding of the successes of and challenges to these technologies and an assessment of the relative sophistication, or lack thereof, of Roman peasant agriculture.

New data on Roman agriculture would be particularly useful at this juncture. Early work (White 1970; Frayn 1979; Spurr 1986) relied heavily on the so-called Roman agronomists, Cato, Varro, Columella, Palladius, following their sources as more or less reliable guides to actual practice. Recent work has drawn on increasingly diverse data—Egyptian papyri, the juridical and epigraphic corpora, as well as archaeological data and economic models for pre-modern agriculture generally—to make quantitative assessments about the carrying capacity of the land, crop yields, and other calculations of performance (Kehoe 1997, 2007; Kron 2012a, 2015; Bowman and Wilson 2013; Erdkamp, Verboven, and Zuiderhoek 2015). Finally, a third methodological strand, which has addressed ancient agriculture writ-broad, has drawn more heavily on ethnographic sources to understand agrarian behaviors: labor practices, storage, risk mitigation, etc. (Garnsey 1988, Gallant 1991; Forbes and Foxhall 1995; Shaw 2013; Halstead 2014).

The absence of systematic and robust data in all these studies is notable and is particularly true of Roman Italy: the agronomic texts do not lend themselves to quantitative assessment as they are as much literary productions as "how-to guides," while important new work on the legal material (Lo Cascio and Storchi Marino 2001; Lo Cascio 2009) likewise relies on limited sources rather than big data sets. The archaeological data has, until recently, been spotty: published botanical analyses from a range of sites in the southern Mediterranean are still few (194 Roman sites with archaeobotanical data are listed in the BRAIN database https://brainplants.unimore.it) making it difficult to understand plant landscapes broadly except by extrapolative modeling (e.g., Goodchild 2013). The study of faunal remains and animal husbandry in Italy is comparatively more advanced (MacKinnon 2004).

The RPP constitutes the first deliberately collected archaeological dataset on Roman agriculture from Italy to specifically address the experience of small cultivators. Primary data from archaeobotanical, faunal, and geoarchaeological contexts, and secondary data from finds, site placement and

architecture, and movement analysis were collected in order to assess basic elements of Roman peasant agricultural practice.

While this study marks many firsts, like the preceding studies it, too, is incomplete. With the exception of one site, it proved too difficult logistically to carry out the large-scale phosphate and nitrogen analysis that might have revealed something of manuring patterns near excavated sites. Isotope work that may have indicated movement of animals and other foodstuffs and transhumance strategies was likewise not carried out for reasons of costs. An off-site pollen core could have made it possible to observe the pollen rain of the area without a strong local human interference (such as transport of plants into the site). And extensive ^{14}C sampling that might have provided indications of seasonality such as cropping, culling, other activities, was likewise not performed.

Aside from the data not collected for logistical or cost reasons, certain kinds of data typically central in discussions of Roman agriculture were simply not found. Most significant is the almost total absence of agricultural tools, from hand tools like hoes and scythes to apparatus like plows and waterwheels. Metal tool finds are rare on Roman agricultural sites, large and small (Ferdière 2009:99): even a large, production-oriented villa like Settefinestre produced only tiny quantities of metal tools (Celuzza, Famà, and De Vos 1985). Post-primary use and post-depositional processes are clearly at work: metal tools were valuable and would have been reused and eventually recycled, while iron and copper alloy can corrode. Assemblages not subject to these factors—like those abandoned in the Vesuvian area Boscoreale villas (Harvey 2010) and our newly discovered blacksmith's workshop at Marzuolo—provide a glimpse of how prevalent metal tools were in rural contexts and the major attrition through recycling and reuse.

Another lacunose data set were the faunal remains: as discussed in detail below, faunal collections at the smallest sites particularly were almost nil. The reasons for this are partly attributable to waste disposal habits, but probably more critically to the nature of distributed habitation and its impact on the material culture of these more sporadically occupied sites.

The data that were collected and processed have challenges of their own. As discussed in Chapter 2, excavated pollen data does not reveal a straightforward map of the locale's plant landscape: differential pollen production by different species, preservation issues, and the chronological palimpsest represented by pollen all require pollen data to be assessed with care. Rather than the reconstruction of the local landscape, the pollen and macroremain data from each site must be laid against nearby sites in a relative, rather than absolute relationship. Geological data likewise should also be parsed comparatively, rather than absolutely: land evaluation is an assessment of contemporary geological, soil, and hydrological potential. There are good reasons, discussed in Chapter 3 and below, to believe these circumstances to be little changed from antiquity, but such change cannot be completely discounted. It is, thus, more appropriate to assess land evaluation as possibilities, not determinations of human action.

13.1 Land Evaluation in the Project Area (AA)

The whole of the project area was subject to a land units analysis, resulting in a map of suitability for agricultural production, in a scale of 1:25,000 (see Fig. 3.19). As discussed in detail in Chapters 2 and 3, land unit maps offer a way to read, communicate, and interpret the physical landscape. These land unit maps then form the basis for evaluating agricultural potential in the form of land evaluation maps. The resulting land evaluation does not provide a reconstruction, but rather a non-weighted "menu" of the various potential land uses. This technique has only recently been applied to archaeological contexts, where it has been used to help assess the agricultural potential of past landscapes in central, inland, and southern Italy (Finke et al. 1994; Joolen 2002, 2003; Kamermans 20004; Arnoldus-Huyzendveld and Pozzuto 2008; cf. Goodchild 2007: ch. 5).

Part of the challenge in assigning evaluation rankings is that ancient land use preferences were not the same as ours today (Verhagen 2002; Burri 2014). Our modern ranking of preferences in which the most fertile land is assigned to cereal and tree crops, followed by pasture, with "marginal" lands assigned to forest, is not fully applicable to historic times. As recent work has made clear, forest agriculture and grazing may have been particularly desirable and profitable enterprises and comprised an

equal partner with other crops in overall land use and agricultural strategies (Kron 2005b; Ulrich 2007; Veal 2013). Therefore, the land evaluation for cereal cultivation alone, although important, is a limited approach. As discussed below, Roman perceptions of land "suitability" may have varied for other reasons. A comparison of the Roman agronomists' categories of soil suitability has shown certain overlaps with modern categories, but a divergence around fertility, emphasized by modern methods such as the FAO, versus workability, preferred by the agronomists (Favory, Girardot, and Zannier 1995). This issue of workability will be taken up below.

Thus, for the non-mechanized cultivation of cereals and forage crops, the evaluation classes S1, S2, S3, and N were applied with the following definitions, derived from the land units maps:

- Class S1 Highly Suitable: Land having no significant limitations to sustained application of low technology cereal cultivation, or only minor limitations that will not significantly reduce productivity or benefits and will not raise inputs above an acceptable level.

- Class S2 Moderately Suitable: Land having minor limitations that in aggregate are moderately severe for sustained application of low technology cereal cultivation; the limitations will reduce productivity or benefits and increase required inputs to the extent that the overall advantage to be gained from the use, although still attractive, will be appreciably inferior to that expected on Class S1 land.

- Class S3 Marginally Suitable: Land having limitations that in aggregate are severe for sustained application of low technology cereal cultivation and will so reduce productivity or benefits, or increase required inputs, that this expenditure will be only marginally justified.

- Class N Not Suitable: Land having limitations that appear so severe as to preclude any possibilities of successful sustained use of low technology cereal cultivation.

For the creation of land evaluation maps, we first assumed that finely textured soils were more suitable for cereal and forage crops production than medium textured soils, due to their higher natural fertility and water availability (Hypothesis I, Fig. 13.1). Though this criterion remains valid, the interpretation may be challenged by the difficulty of plowing dry clayey soil with lighter tools, like a wooden plow (Spurr 1986:27; Halstead 2014:22, 35). Indeed, recent work in the Tiber Valley, as well as an analysis of the Roman agronomists, has suggested that light, workable soils were preferred over heavy, potentially more fertile alluvial lands (Favory, Girardot, and Zannier 1995; Verhagen 2002:203; Goodchild 2007:147–150; 176). Heavy, clayey soils may have been somewhat more suitable as pasture, and occasionally used for sown crops. A second hypothesis was generated (Hypothesis II, Fig. 13.2) with a reduction in the land rated highly suitable (S1) for cereal/forage crops to S2.

Rough statistics for the various land evaluation classes for the whole mapped area are found in Tables 13.1 and 13.2. As can be seen, while the percentage of highly suitable land changes depending on how the heavy, clayey soils are rated, the combined total of classes S1 and S2 does not change between the two hypotheses, nor the extensions of S3 and N each. In short, regardless of hypothesis, about half (48–49%) the overall land in the study locale was well or moderately well suited to cereal and forage crops.

Color Figure 13.3 and Table 13.3 present the suitability data from Hypothesis I, overlain with the late Republican and early imperial survey data (Ghisleni 2010), including those sites excavated by the project. Most sites (81%) are located on units qualified as S1 and S2. Only 2% of sites are located on class N parcels.

While the results may seem obvious—i.e., Romans selectively settled areas with high or medium potential for cereal crops for ease of cultivation—a variety of factors may have led to this pattern (cf. Goodchild 2007). More frequent modern plowing in these parcels may have led to a major visibility of the ceramic sherds on the surface. Other ancient factors were also doubtless in play, particularly water resources and routeways: locally abundant water in the form of springs or surface outflows originating from the *macigno* sandstone ridge near Colle Massari and Case Nuove (see Chs. 5 and 8), may have made the marginally suitable soils of class (S3) more attractive. That area as well as the area around Pievina also boasted the presence of possible routeways through the project area (see Ch. 17) as well as easy access

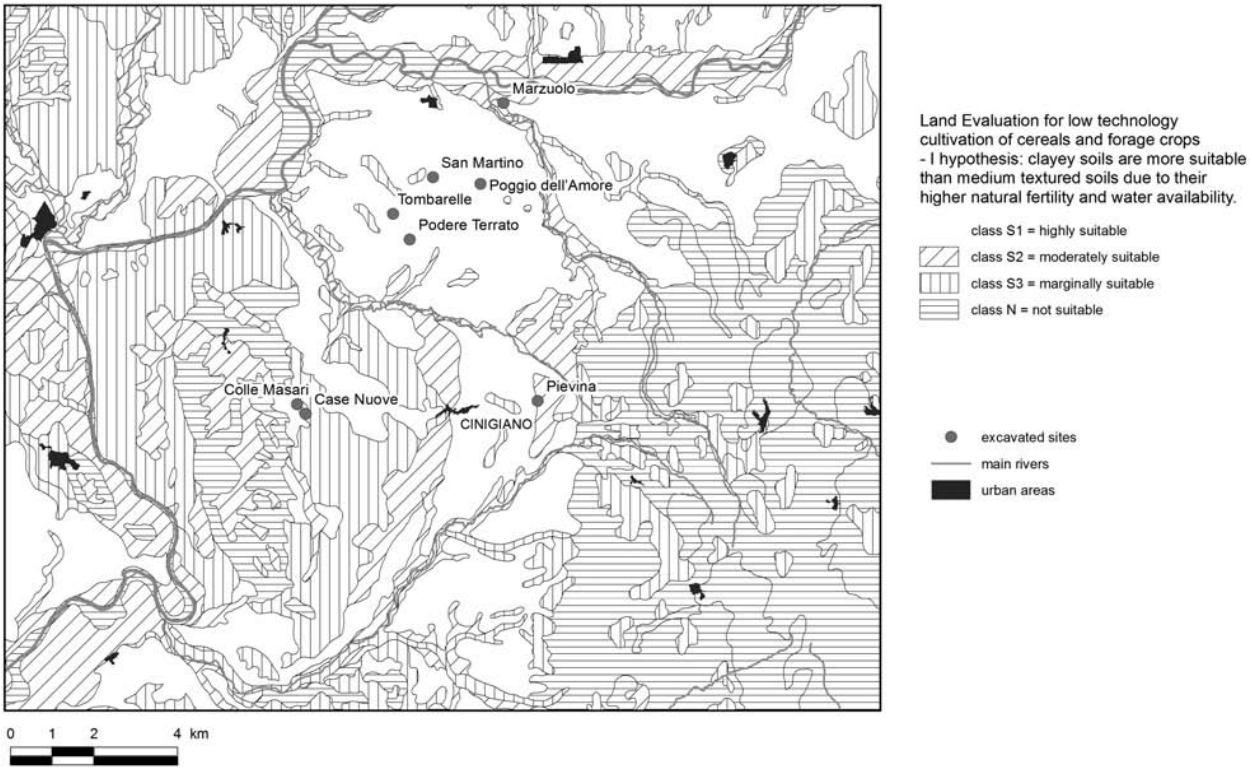


Fig. 13.1 Land evaluation map, project study area, Hypothesis I (fine textured soils more preferable for cereal/forage crops) (AA).

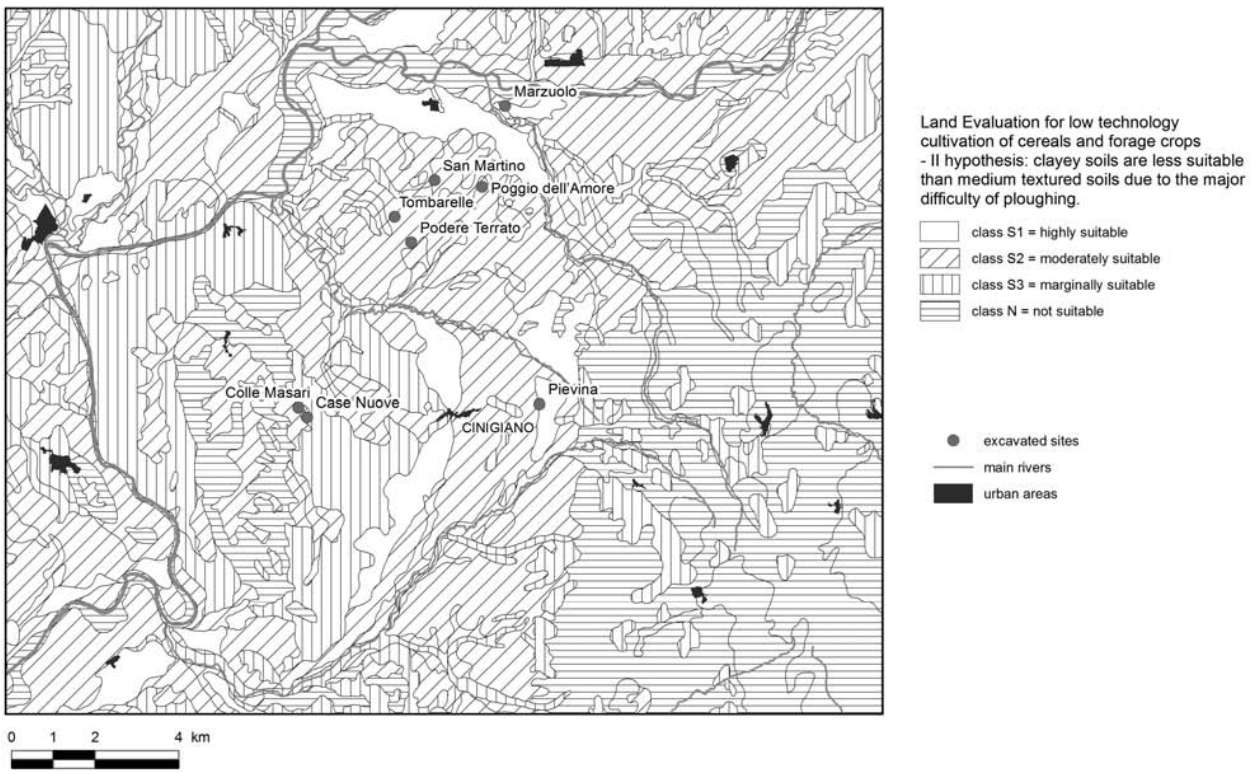


Fig. 13.2 Land evaluation map, project study area, Hypothesis II (fine textured soils less preferable for cereal/forage crops due to difficulty in plowing) (AA).

Table 13.1 Percentage of land occupied by the various evaluation classes in the project locale: Hypothesis I (AA).

Class	Extension in ha	%
S1	12080	33
S2	5600	15
S3	8140	22
N	10440	29

Table 13.2 Percentage of land occupied by the various evaluation classes in the project locale: Hypothesis II (AA).

Class	Extension in ha	%
S1	2790	8
S2	14890	41
S3	8140	22
N	10440	29

Table 13.3 Percentage of late Republican/early imperial survey sites located on various land evaluation classes: Hypothesis I (AA).

Class	%	Count
S1	62.8	120
S2	18.3	35
S3	16.8	32
N	2.1	4

Table 13.4 Percentage of late Republican/early imperial survey sites located on various land evaluation classes: Hypothesis II (AA).

Class	%	Count
S1	22.0	42
S2	59.2	113
S3	16.8	32
N	2.1	4

to two different ecological zones, forested upland slopes and the rich valley soils.

Color Figure 13.4 and Table 13.4 present the site data with Hypothesis II land suitability: here again 81% of sites are located on S1 or S2 parcels. However, here, the vast majority of sites are not placed directly on highly suitable land but rather in the S2 parcels, whose difficulty for plowing may have rendered them more suitable for pasture. Again, adjacency to cereal-suitable land, and/or upland resources, characterizes many of these sites. Both the overall importance of pasture in this region, and the relationship between distributed habitation and specific land use may also be factors here, and both will be discussed in detail below.

13.2 Land Use in the Project Area (AMM, ER)

As the question of suitability for plowing makes evident, land units analysis indicates only the possible uses of land, not the complex set of decisions that lead to actual land use. To understand how the land was actually used, the botanical remains provide the most direct indicators, particularly excavated pollen which provides a broader panorama of plant landscapes in the locale and in the region. The total data is presented in each of the above Chapters 5–11, as well as the extract tables cited below. Pollen amounts in sediments depend on many factors (species productivity, pollen transport, taphonomy, site use, etc.), and, therefore, the percentages must be interpreted, considering the archaeological contexts and comparing layers of the same chronology, from one or many sites. Taken together with the land suitability data, and with other information from the sites themselves, a clearer picture about peasant decision making emerges.

Woodlands:

Woodlands in the project area were a mixture of oak and other mesophilous woods, some conifer trees and Mediterranean woods. At most sites, deciduous *Quercus* dominate, while Mediterranean woods and shrubs are less represented in keeping with their relatively less abundant pollen productivity. This is

indicative of the presence of both mixed oak woods and Mediterranean vegetation in the area. Marzuolo Phase 2 was something of an exception, where *Erica arborea* and other Mediterranean species are more prevalent and perhaps indicative of the highly disturbed landscape around the ceramic center. The deciduous woodlands also included *Fagus* and very occasionally *Castanea* in the hilly/mountain belts near Colle Massari/Case Nuove, while the conifers included small amounts of *Abies* and *Picea*, as well as *Pinus*. Again, this mixture seems to be reasonably stable over time, site-to-site variation predominating over chronological variation.

Ratios of AP/NAP from pollen at in-site records were low (Table 13.5), ranging from Colle Massari Romano with 18/82 and Podere Terrato with 17/83, down to the almost deforested environment around Phase 3 Marzuolo, with 9/91, or the equally denuded lands around Tombarelle Phase 1 with 4/96. This indicates that, in general, woodlands of any size were not generally found near our sites, while these ratios show no major chronological changes between the 2nd c. BC and the 5th c. AD.

The consistency of these low forestation numbers, even in areas which today are more heavily wooded like Colle Massari Romano with contemporary AP/NAP of 75/25 (modern spectrum), strongly indicate that the whole of the study area contained only sparse and sporadic woods and should *not* be imagined as being heavily forested in the Roman period—no more so than it is today. This notion is supported by those cases in which in-site and near-site samples were taken—the near-site samples possibly representing the vegetation landscape (just) next to and thus possibly prior to the site in question (see Table 13.5). In these sites, there is often a slightly higher incidence of arboreal pollen in the near/pre-site samples (e.g., San Martino, Poggio dell'Amore, Colle Massari). This slightly higher value may simply reflect the removal of trees/shrubs in the immediate area of the structure but does not point to a radical restructuring of the plant locale. This absence of signs of major changes in forest cover pre- and post-site is particularly noteworthy in the two earliest sites in the project, San Martino and Tombarelle Phase 1, whose origins lay sometime in the later 2nd c. or early 1st c. BC. These two early sites have quite different surrounding tree landscapes—San Martino a "typical" pastoral/husbandry landscape with trees some distance away, probably lining the nearby Fosso Vallanzo, while at Tombarelle the surrounding space had been almost denuded of trees. What they share, however, is the

Table 13.5 Woodland composition, including AP/NAP ratios and different woodlands, all sites.

Sites	AP/NAP in-site (%)	AP/NAP near-site (%)	Mixed oak woods in-site (%)	Mediterranean trees/ shrubs in site (%)
Pievina	N/A	N/A	N/A	N/A
Case Nuove Phase 1.2	N/A	N/A	N/A	N/A
Case Nuove Phase 2	14/86	N/A	5.5	2.9
San Martino (in-site)	15/85	20/80	5.3	1
Poggio dell'Amore (in-site)	13/87	14/86	5.3	0.1
Colle Massari Romano (in-site)	18/82	32/68	8.9	0.5
Podere Terrato	17/83	N/A	6.1	0.7
Marzuolo Phase 1	N/A	N/A	N/A	N/A
Marzuolo Phase 2	12/88	N/A	3.9	3.6
Marzuolo Phase 3 (Area 1 and Area 3 averaged)	9/91	N/A	3.1	0.7
Tombarelle Phase 1	4/96	N/A	2.9	0.2
Tombarelle Phase 2	N/A	N/A	N/A	N/A
Tombarelle Phase 3	17/83	N/A	9.1	0.4

negative evidence that neither early site was inserted into a heavily forested pre-site landscape.

The lack of major forestation change during the late Republic through late antiquity raises the question of whether the locale was never heavily forested, or whether an important moment of deforestation took place prior to the Roman occupation. Pollen and charcoal data suggest that no uniform "moment" of deforestation impacted the whole of central Italy—either in Etruscan or Roman times—but rather that local circumstances varied enormously; from strong forestation changes in the 1st c. BC through 3rd c. AD around Populonia, to equally notable forest maintenance near the 1st c. AD Tiber basin, Naples and northern Latium (cf. Sadori, Mercuri, and Lippi 2010; Harris 2013a; Russo Ermoli et al. 2013; Di Pasquale et al. 2014a).

Analysis of the land suitability data reveals similar probability for a tree-sparse landscape. Just as the percentage of good arable land available (not necessarily used) for cereal crops can be calculated on the basis of the land suitability map (Hypothesis I), so too can models be tested for forestation (Figs. 13.5–13.8). In these three scenarios, all land units labeled as "N" (Not suitable for cereal crops) N+S3, and N+S2+S3, respectively, were mapped as having forest cover. The fourth map shows current forest cover in the project area. The different scenarios describe theoretical probabilities of everything from 29–51% of the project area with tree cover, while the current situation is even less heavily forested (ca. 19% up to 33% if shrubs are included). In all scenarios, forestation is focused on the E and W parts of the locale. Assuming, as we have, that the landscape was geologically little changed, none of these scenarios suggest a heavily forested Roman landscape. When taken together with the pollen data from all sites in all periods, which have an average AP/NAP of ca. 13/87, light forestation is again the likeliest possibility.

Pasture

Notable from the data collected in all eight excavated sites is the consistent importance of pasture. LPPI's (excluding Cichorieae, which are overrepresented in our sites) indicate grazed pasture and range from 6.9% at Tombarelle Phase 1 to 18.5% at Marzuolo Phase 2 (Table 13.6). With Cichorieae included, the percentages are higher with a mean of 41.8%. Data from late Republican/early imperial contexts (San Martino, Poggio dell'Amore, Podere Terrato, Marzuolo Phase 3) are not consistently different from those from late antique contexts (Case Nuove Phase 2, Tombarelle Phase 3) but rather vary site by site, phase by phase. As a component of the pollen spectrum, pasture plants play a major role.

The prevalence of Cichorieae among the pasture pollen, and in the spectra, could be in part a factor of pollen morphology and conservation factors: the fenestrate pollen in the subfamily Cichorioideae (Florenzano et al. 2014) has a thick and easily recognizable exine, thus, is potentially overrepresented in pollen spectra (Dimbleby 1985). This potential overrepresentation may be pronounced in contexts with poor pollen preservation as an effect of selective corrosion (Bottema 1975), and, in some instances, it has been observed that as pollen concentration decreases, Cichorieae increase along with unidentified grains (Navarro et al. 2001; Muller et al. 2008). In our samples, an increase of Cichorieae does not correspond to an increase of deteriorated pollen, and indeed the diversity of pollen taxa is high, also including low-producing or thin-exine grains (such as Cyperaceae). Although some overrepresentation of these well-identifiable pollen grains is evident, their significance is not due to taphonomic bias. The presence/prevalence of these pollen grains seems a true feature of human-induced landscapes in Italy more generally (Mercuri et al. 2010). Indeed, pollen curves throughout Italy show clear and concomitant increasing trends of Cichorieae and Poaceae curves as an evidence of pastureland expansion since the Bronze Age (Mercuri et al. 2012; Cremaschi et al. 2016; Marignani et al. 2017).

The pollen pasture record includes indicators for grazed (e.g., *Aster* type, *Centaurea nigra* type, *Matricaria* type, Cichorieae, *Ranunculus* type, Ranunculaceae indiff., *Potentilla* type, *Galium* type, *Heracleum* cf.), as opposed to simply wild or abandoned land (Apiaceae indiff., *Brassica* type and Brassicaceae indiff., Caryophyllaceae indiff.). Similarly, in all sites the presence of coprophilous fungi like *Sordaria* type and *Sporormiella*, indicates the presence of pasture animals on or near our sites. Likewise, the presence of parasite eggs (e.g., Case Nuove) is strongly indicative of excrements of ruminants (*Dicrocoelium* and several species of *Trichuris*). That is, the significant presence of pasture implies an importance of pasture animals.

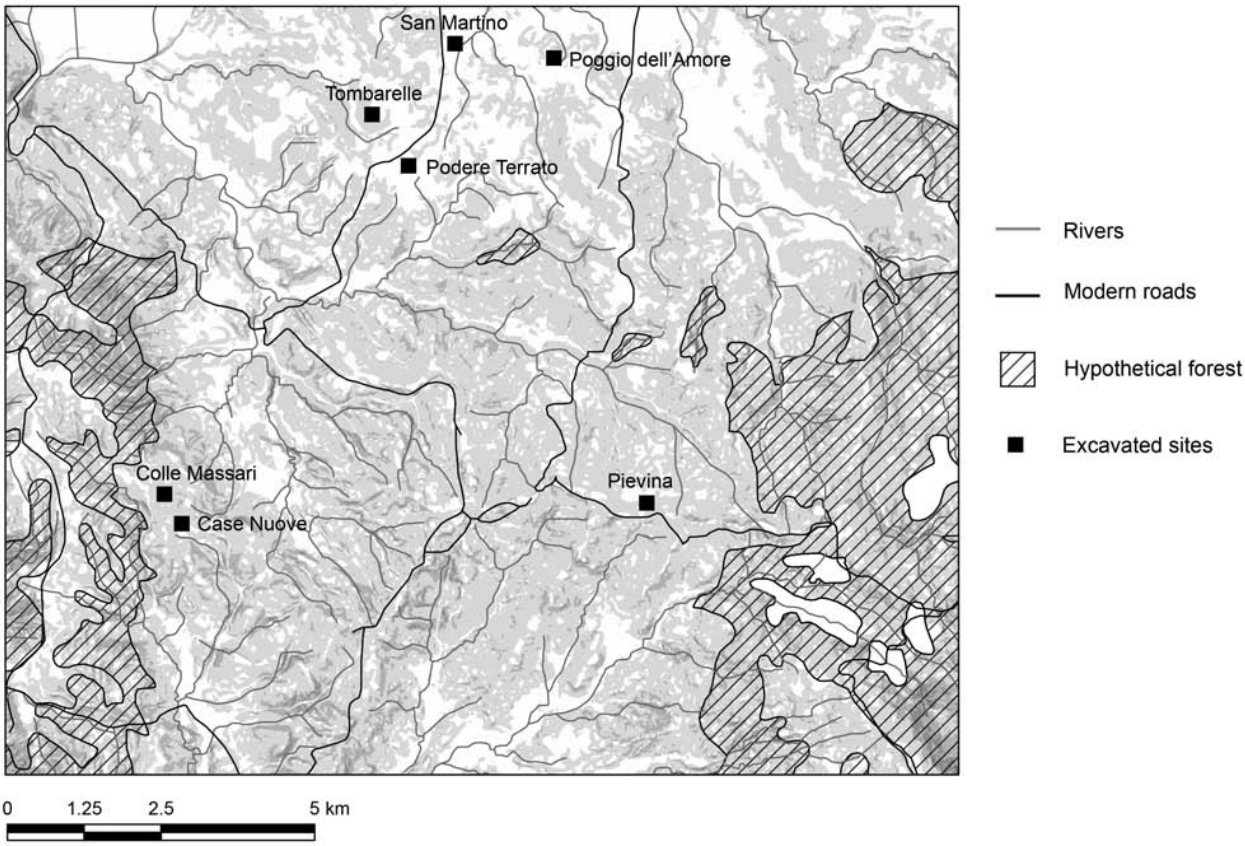


Fig. 13.5 Theoretical distribution of forests based on land evaluation, assuming "N" land forested (AA).

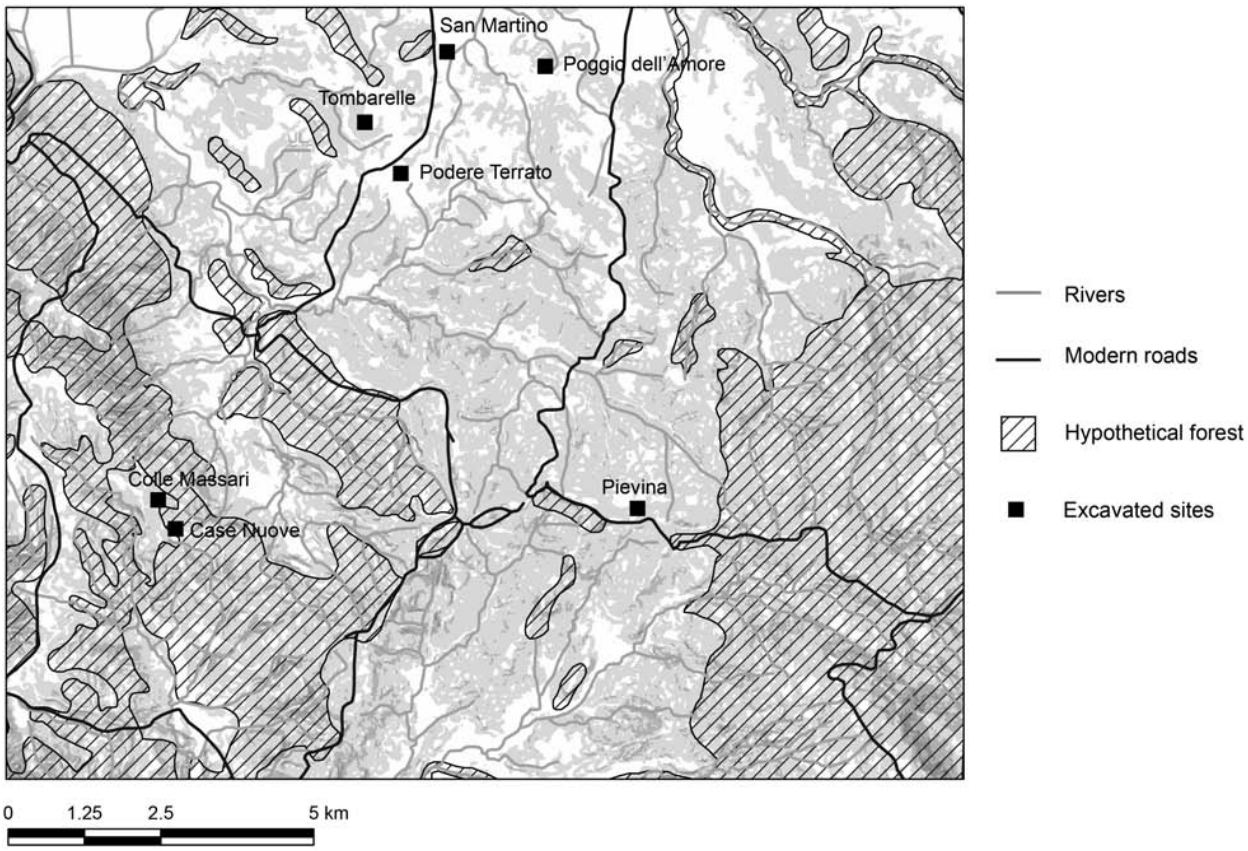


Fig. 13.6 Theoretical distribution of forests based on land evaluation, assuming "N" and "S3" land forested (AA).

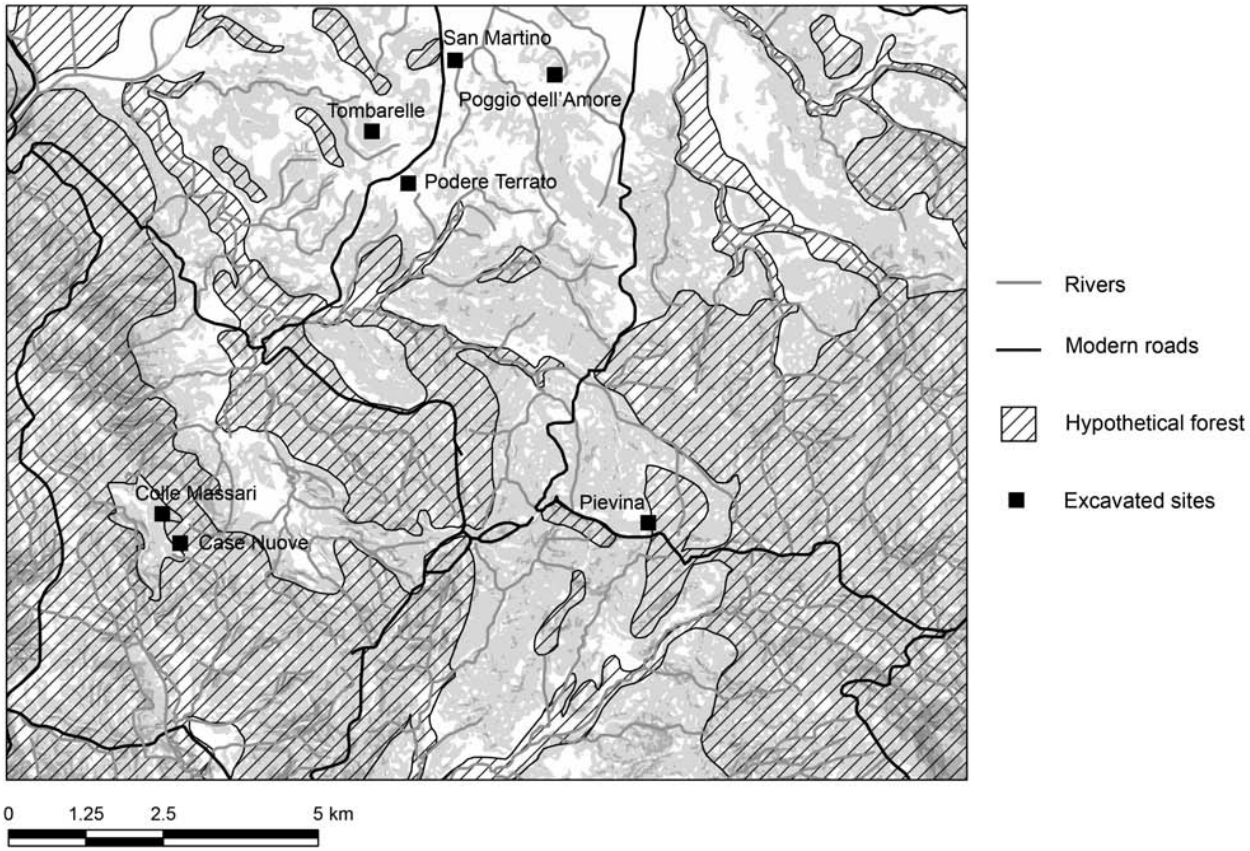


Fig. 13.7 Theoretical distribution of forests based on land evaluation assuming "N" "S3" and "S2" land forested (AA).

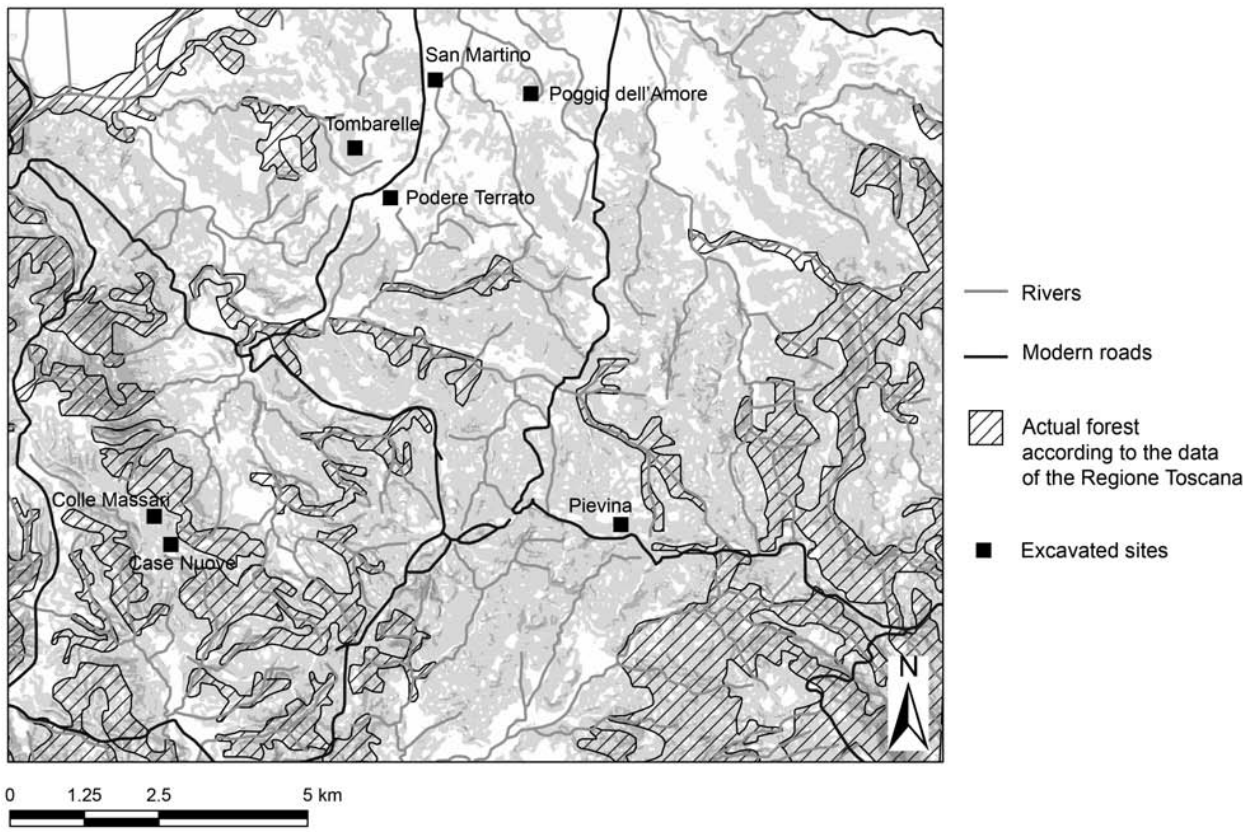


Fig. 13.8 Actual distribution of forests in Project area according to the data of the Regione Toscana (AA).

Table 13.6 Pasture indicators, LPPI and NPP, all sites (AM/ER).

Sites	LPPI pollen % (w/out Cichorieae)	LPPI pollen % (w/ Cichorieae)	NPPs
Pievina	N/A	N/A	N/A
Case Nuove Phase 1.2	N/A	N/A	N/A
Case Nuove Phase 2	7.6	41.3	*Sordaria* type, *Sporormiella*, *Dicrocoelium*, *Trichuris*
San Martino (in-site)	7.6	51.9	*Sordaria* type, Sordariaceae indiff., *Spegazzinia*, *Sporormiella*, *Dicrocoelium*, *Trichuris*
Poggio dell'Amore (in-site)	11.7	47.8	*Sordaria* type, Sordariaceae indiff.
Colle Massari Romano (in-site)	11.7	52.6	*Sordaria* type, Sordariaceae indiff.,
Podere Terrato	13.1	44.7	Sordariaceae indiff., *Sporormiella*, *Dicrocoelium*
Marzuolo Phase 1	N/A	N/A	N/A
Marzuolo Phase 2	18.5	32.4	None
Marzuolo Phase 3 (Areas 1 and 3 averaged)	12.5	47.8	*Sordaria* type, Sordariaceae indiff., *Sporormiella*, *Dicrocoelium*
Tombarelle Phase 1	6.9	32.1	*Sordaria* type, *Sporormiella*
Tombarelle Phase 2	N/A	N/A	N/A
Tombarelle Phase 3	10.3	25.8	*Sordaria* type, *Sporormiella*, *Dicrocoelium*
AVERAGES			
Mean	**11.1**	**41.8**	
Median	**11.7**	**44.7**	
Range	**11.6**	**20.5**	

Cereals

Cereals are present at every site, but as a less significant part of the spectrum (Table 13.7). Their low value in pollen spectra is well-known, and it is due to the low productivity of cereals compared with other grasses and coupled with their large pollen size (>40 μm) that makes them less transportable at distance from the source field. As cereal pollen is not easily transported far from the field, its occurrence is highly indicative of fields near the site. Values of cereal pollen <1% may be found, for example, in necropolises (Casinalbo, Bronze Age), while percentages >20% marks special samples indicating some accumulation and plant processing on site (Mercuri et al. 2013).

Cereal pollen ranges from 1.3% of the spectrum at San Martino (in-site), to 17.0% in Phase 1 at Tombarelle with a mean of 5.8%, median of 4.4%, and range of 15.7%—a significantly greater variation between sites than we noted for pasture. Three of the highest percentages—Case Nuove Phase 2 (4.5%), Marzuolo Phase 3 (5.8%), and Tombarelle Phase 1 (17.0%) are dump contexts with additional macroremains and other evidence for deliberate plant accumulation (see Chs. 5, 10, and 11, respectively). Leaving these particular cases aside, Marzuolo Phase 2 (the most intense moment of that site's Italian sigillata ceramic production) stands out as having a particularly cereal-rich mean spectrum with cereals at 9.9%. The 4.5% recorded at Case Nuove is consistent with plant processing on the site. The rest of the sites are remarkably consistent with much lower numbers reflecting more clearly the diffuse presence of cereal fields in the landscape. A number of spores were found which belong to Basidiomycota parasites of plants: *Tilletia* (in all sites) and *Puccinia* (in Case Nuove, San Martino, and Marzuolo) are parasites

Table 13.7 Cereal indicators, including pollen, macroremains, and NPPs, all sites (AM/ER/RR).

Sites	Cereal pollen (%)	Cereal macro (total records)	Cereal macro (species)	Cereal NPPs
Pievina	N/A	N/A	N/A	N/A
Case Nuove Phase 1.2	N/A	4	Cereals indiff., *Triticum* sp., *Triticum durum*	N/A
Case Nuove Phase 2	4.5	131(1)	Cereals indiff., *Hordeum vulgare*, *Triticum* sp., *Triticum aestivum*, *Triticum dicoccum*, *Triticum monococcum*	*Puccinia*, *Tilletia*
San Martino (in-site)	1.3	0	N/A	*Tilletia*
Poggio dell'Amore (in-site)	3.2	0	N/A	*Tilletia*
Colle Massari Romano (in-site)	3.2	0	N/A	*Tilletia*
Podere Terrato	3.3	0	N/A	*Tilletia*
Marzuolo Phase 1	N/A	0	N/A	N/A
Marzuolo Phase 2	9.9	40	*Hordeum vulgare*, *Triticum* sp., *Triticum dicoccum*	*Puccinia*, *Tilletia*
Marzuolo Phase 3 (Areas 1 and 3 averaged)	5.8	10	*Triticum* sp., *Triticum aestivum*	*Puccinia*, *Tilletia*
Tombarelle Phase 1	17.0	3	*Triticum* sp.,	*Tilletia*
Tombarelle Phase 2	N/A	0	N/A	N/A
Tombarelle Phase 3	4.4	0	N/A	*Tilletia*
AVERAGES				
Mean cereal pollen (%)	**5.8**			
Median cereal pollen (%)	**4.4**			
Range cereal pollen (%)	**15.7**			

of cereals, supporting the local presence of cereals fields.

Chapter 14 discusses the cereal data as it affects diet in more detail, but it is worth noting here that the macroremain data, although not robust, indicate that wherever cereals are grown there is a mixed cereal regime, including naked and hulled wheats, barley, and the farro family. Some of these, such as barley and farro, might also be used as fodder.

Fodder Crops

Like cereals, fodder crops belonging to the Fabaceae family appear consistently in the study landscape (Table 13.8). While Poaceae is a generalist taxon belonging to many different habitats, the Fabaceae pollen is important evidence of fields, probably cultivated for fodder and useful for supplying nitrogen to the soils after cereal exploitation. Fabaceae are low-producer plants that do not spread their pollen in the environment; the presence of pollen thus proves the plant grows close to the site. Fabaceae pollen ranges from ca. 3% of the spectrum at most sites (Poggio dell'Amore, Podere Terrato, Tombarelle, Marzuolo Phase 3) to 4–5% at Marzuolo Phase 1 and Case Nuove. The maximum, 5.8%, was found at San Martino, a value which is consistent with the fodder accumulated to feed animals in the possible stable.

When genus and/or species identification was possible, the most common fodder crops were *Lotus* (*corniculatus*; Birdsfoot trefoil), *Medicago* (*lupulina* and *arabica*; Black medic and spotted medic) and above all various members of the true clover family *Trifolium* (*repens*, *arvense*, *campestre*, and *pratense*). Macroremain data add to this list lentils (*Lens culinaris*) and broad beans (*Vicia faba*), present in small quantities at Marzuolo Phase 2 and Case Nuove Phases 1.2 and 2. It should be noted that barley,

emmer, and farro, among the present cereal crops, are also potential fodder crops.

Many of these species appear in agronomists' texts as recommended fodder plants, as well as in the few preserved archaeological samples of animal fodder from Pompeii and Oplontis (Kron 2004; Ciaraldi 2007:75–85). It is noteworthy in this regard that two of the major fodder crops both mentioned in the textual record and found in archaeological fodder corpus—*Medico sativa* (alfalfa) and *Trigonella foenum-graecum* (fenugreek)—are absent from our collections.

Most striking is the similar percentages of fodder and cereal pollen at a series of sites: these relationships speak to the possibility of crop rotation in the locale, a subject that will be discussed in detail below.

Grape and Olive

Much rarer at all sites are the currently ubiquitous grape and olive (Table 13.9). Again, differential pollen production and dispersal must be factored in, as grape pollen particularly is often absent or low on archaeological sites, possibly a by-product of low-pollen production itself caused by the hermaphroditic self-pollination assisted by entomophilous and anemophilous cross-pollination. Turner and Brown (2004) suggest that values of over 0.2% are likely to indicate the on-site presence of a vineyard. The same problems should not affect the quantity of olive pollen, but its representativeness in pollen spectra decreases rapidly out of the olive groves (Florenzano et al. 2017).

Even with these caveats in place, the results do suggest some interesting trends. Only four sites/phases preserved grape pollen (Case Nuove Phase 2; Podere Terrato, Marzuolo Phases 2 and 3), the only sites which also yielded macroremains of *Vitis*. Case Nuove had previously been used as a wine press, while in both Marzuolo Phases 2 and 3 a new form of local amphorae may indicate local production of wine, and recent excavations have revealed a possible wine tank. In three of these cases (Case Nuove, Marzuolo Phases 2 and 3), these were the same sites/phases that produced indications of nearby cereal cultivation. That is, sites with more intensive, nearby crop cultivation may have also preferentially cultivated grapes, among other things.

Olive trees were somewhat more ubiquitous, appearing in the spectrum of seven sites/phases. But percentages were low to very low (<1%) in all cases. This data would suggest olive trees (that can include the wild olive of the same species *Olea europaea* subsp. *sylvestris*) were more or less ubiquitous in the landscape, but low in numbers or distant from our sites. Macroremains were found only at Case Nuove Phases 1, 1.2, and 2 and Marzuolo Phase 2 (Phases 1 and 3 had only one record each). Overall, a low presence of olive groves cultivated in Roman period Tuscany versus today is suggested by our data, and this is echoed by data from other sites (Bellini, Mariotti Lippi, and Montanari 2009; Di Pasquale et al. 2014a; Mercuri et al. 2015).

As with the grape data, it is noteworthy that sites/phases which showed signs of proximate olive trees also had evidence for either wine production, intensive cereal production, and/or other plant accumulation. Again, it is interesting to note the association of olive and grape with more intensive cereal processing/production.

Other Edibles

Only one site, Podere Terrato (see Ch. 9), yielded plant evidence for a proximate garden. Pollen of flowers such as lilac, geranium, and bellflowers, herbs like sage, mint, and rue are uniquely present here and in no other site in the project. The site also had relatively higher pollen presence of Brassicaceae than other sites (1.2%): Brassicaceae, which include the cabbage, broccoli, and radish, were consumed in quantity by Romans and have been often found in quantity from pollen in Roman harbors (cf. Russo et al. 2013).

Likewise, macroremains at the site yielded not only a wide variety of leguminous fodder plants, but also seeds of vegetables like celery and orache, despite generally poor levels of preservation. In some senses, this single example of a nearby garden is unexpected: particularly at sites that fall on the more permanent end of the habitation spectrum (see Ch. 12) or with those that show signs of other proximate cereal, grape, or olive production, one might expect to find a nearby garden. Where were the small vegetable patches that one would have expected to dot the landscape? Here one misses particularly the botanical evidence from Pievina, a more permanently inhabited site without the major production activities that might have masked the more fragile signature of these little plots. Pollen of vegetable and garden

Table 13.8 Fodder (legumes, pulses, and other fodder) indicators, including pollen and macroremains, all sites (AM, ER, RR).

Sites	Legumes/pulses/fodder pollen (%)	Legumes/pulses/fodder macro (total records)
Pievina	N/A	N/A
Case Nuove Phase 1.2	N/A	5
Case Nuove Phase 2	4.5	18(15)
San Martino (in-site)	5.8	11
Poggio dell'Amore (in-site)	3.4	10
Colle Massari Romano (in-site)	1.4	0
Podere Terrato	2.7	14(3)
Marzuolo Phase 1	N/A	0
Marzuolo Phase 2	3.9	10
Marzuolo Phase 3 (Areas 1 and 3 averaged)	2.8	7
Tombarelle Phase 1	1.7	0
Tombarelle Phase 2	N/A	0
Tombarelle Phase 3	3.6	0
AVERAGES		
Mean Legume pollen (%)	**3.3**	
Median Legume pollen (%)	**3.4**	
Range Legume pollen (%)	**4.4**	

plants are, however, entomophilous and low-pollen producers. The record from Podere Terrato suggests that we were lucky to intercept the exact point where the garden was, while possibly in the other cases we collected samples out and too far from the gardens. Gardens are expected near houses rather than stables or small storage rooms.

More common local food, seemingly, were the cultivated or wild fruit trees found in most sites as pollen and/or macroremains. Pollen of hazelnut, plum, raspberry/blackberry, and wild cherry dogwood were found in most sites and probably were to be found in the small woods and/or field boundaries nearby (cf. similar finds reported in Sadori, Mercuri, and Mariotti Lippi [2010]). Walnut and chestnut are found in the higher elevation sites like Colle Massari and Case Nuove, and at Marzuolo. While some walnut trees might have been grown locally, it is probable that the few examples of chestnut pollen arrived from plants living in the Monte Amiata slopes, as its small grain (ca. 15 microns) and can be easily wind transported a long distance from the plant source.

13.3 Plant Accumulation and Transport (AMM, RR)

Plant accumulation and the transportation of plant materials throughout the landscape was challenging to find, largely due to the generally poor preservation of macroremains in all sites. Some exceptions are important to note. Small-scale fodder accumulation was identified with macroremains and pollen at San Martino. This evidence was bolstered by important quantities of coprophilous fungi, algae, and other indicators, suggesting that fodder may have been occasionally gathered for the stabling of animals.

Four or five particular cases of grain accumulation were noted. At Case Nuove Phase 2 (early 5th c. AD), the square pit yielded notable quantities of cereal pollen (3.5%). The few charred chaffs including forks and rachis fragments of both wheat and barley point to threshing or winnowing activities on site, a supposition supported by the presence of hand grinding stones in the pit, and the site's high, windy elevation. At Marzuolo Phase 2, a high percentage of cereal pollen (9.9%) including some folded-crumpled grains points to proximate fields, plus a significant quantity of cereal caryopses were found in the contexts adjacent to the great kilns. The later phases at Marzuolo show similarly high pollen presence of cereals, but fewer macroremains emerged from either the fill in Area I or the living levels in Area III. In Tombarelle Phase 2 (late 1st c. BC/AD), the dumps that filled the square cut included high quantities of cereal pollen (17%) plus weeds associated with crop processing. As noted in Chapter 11, the macroremains that would support this data were largely absent. Finally, although the botanical data is missing, the 1st c. BC phase 1 at Pievina included a pier-supported structure identified as a granary.

Marzuolo was the only site that revealed evidence of plants that may have been transported from elsewhere, namely wood seemingly brought in as fuel for the great ceramic kilns. Macrocharcoals of fir and of beech were taken from the kiln debris of the Phase 2 kilns, and were either used as fuel, for building adjacent structures, or both. Data from both northern Tuscany and around the Bay of Naples have suggested that certain species of beech and fir may have grown at lower altitudes in the past than today (Di Pasquale and Terzani 2006; Di Pasquale et al. 2014b). Pollen cores from the mouth of the Ombrone at nearby Grosseto found few to none of either species in this period (Biserni and Geel 2005), while fir and beech pollen are present only in tiny quantities in other project sites. Thus, while it is possible that both were gathered locally it seems more likely they derive from the slopes of Monte Amiata, where the elevated topography provided ideal habitat. The tiny quantity of *Tamarix* pollen should have come from specimens brought from the coast and like the beech may have been preferentially imported as a hot-burning wood for fuel. The small quantities of chestnut pollen at Marzuolo exclusively in this phase could also be the result of its having hitchhiked with mountain wood shipments, or it may have been windborne.

13.4 Land Use Versus Land Suitability (AA, AMM)

As noted above, we were interested to separate the geological data gathered to evaluate land suitability, from the botanical data that pointed more directly to land use. We hoped that by keeping these two data sets separate, we could gain some insights into actual peasant decision making—that is how similarly suitable lands were selected for different agricultural regimes. That decision making will be conditioned by many factors, one of which we have already highlighted, namely, how much an impediment for plowing were the rich, but heavy soils that characterize some 15% of the lands in the project area.

If we compare the general pollen results from each site against the land suitability, Hypothesis I, for parcels in or adjacent to the site in question, the results show a reasonable correspondence between land suitability and the local plant landscape (Hypothesis I, see Fig. 13.1). Turning, for instance, to the four sites/phases with significant percentages of cereal pollen (Marzuolo Phase 2 and Phase 3, Tombarelle, Case Nuove) all lie in or adjacent to S1, highly suitable, land. Pievina, with its granary, is similarly located. If instead we assume the fine clayey soils were avoided for cereal crops due to the difficulty of plowing (Hypothesis II, see Fig. 13.2), the correspondence between cereal pollen and S1 land diminishes: only Marzuolo and Pievina lie near S1 land in this scenario.

Harder to explain in either scenario are the sites S of the Piani Rossi area: San Martino, Poggio dell'Amore, Podere Terrato, and Tombarelle. In Hypotheses I, all are located in the middle of seemingly excellent land for grain production. Judging from the pollen and macroremain evidence, the area around and between San Martino and Poggio dell'Amore was largely used for pasture and/or fodder crops, while somewhat more grain cultivation took place near Podere Terrato. This might lead one to favor the Hypothesis II reconstruction and take this as evidence that these rich clay landscapes were too difficult to plow and, thus, were favored mostly with pasture or

rotated regime (see below). However, immediately nearby and contemporary with San Martino in the 40s–50s BC was the "central place" of Tombarelle with its seemingly major grain fields. There is no obvious geological reason for these proximate, differential land uses; they can be explained only by human choice.

To provide a sense of these choices, we carried out two detailed land use proposals integrating the land units maps with the archaeobotanical evidence. We examined both the area south of Marzuolo, home to several project sites, and the area around Case Nuove.

Figure 13.9 presents the proposal for the area south of Marzuolo (for the data see Chs. 6–7 and 9–11). Here we assumed that the hard-to-plow clayey hills and the wetter depressions, including the area around the *fontoni*, were used for pasture with the *fontoni* acting as watering holes. For similar reasons, the flood zone of the Orcia River was assumed to have held pastures, as well as the hygrophilous woods known from the Marzuolo pollen spectrum. We assumed the bed of the river, wherever it lay, was bare of crops. Dryer areas we assumed to have been seeded with an alternating combination of leguminous forage crops and cereals, while exclusive cereal cultivation would have been concentrated in the fine-sandy hills, and eventually on scattered plots on the Orcia terraces and along the other rivers; cereal cultivation seems to have reached a peak in the period 50–70 AD. Wood (mainly oak) and olives would have been concentrated on the stonier conglomerates and on the steeper landscape slopes.

Another proposal, described in detail in Chapter 5, is the area around Case Nuove and the villa of Santa Marta (see Fig. 5.30). The area is characterized by the intersection of conglomerate, sandstone, and clay layers that produced a sequence of springs, narrow bands of S1 and S2 land surrounded by N or S3, the latter principally suitable for forests and shrubs. The pollen spectrum was dominated by pasture, with evidence of limited nearby cereal production in late antiquity, and very limited traces of olives and grape. The vineyards and cereals may have lain around the

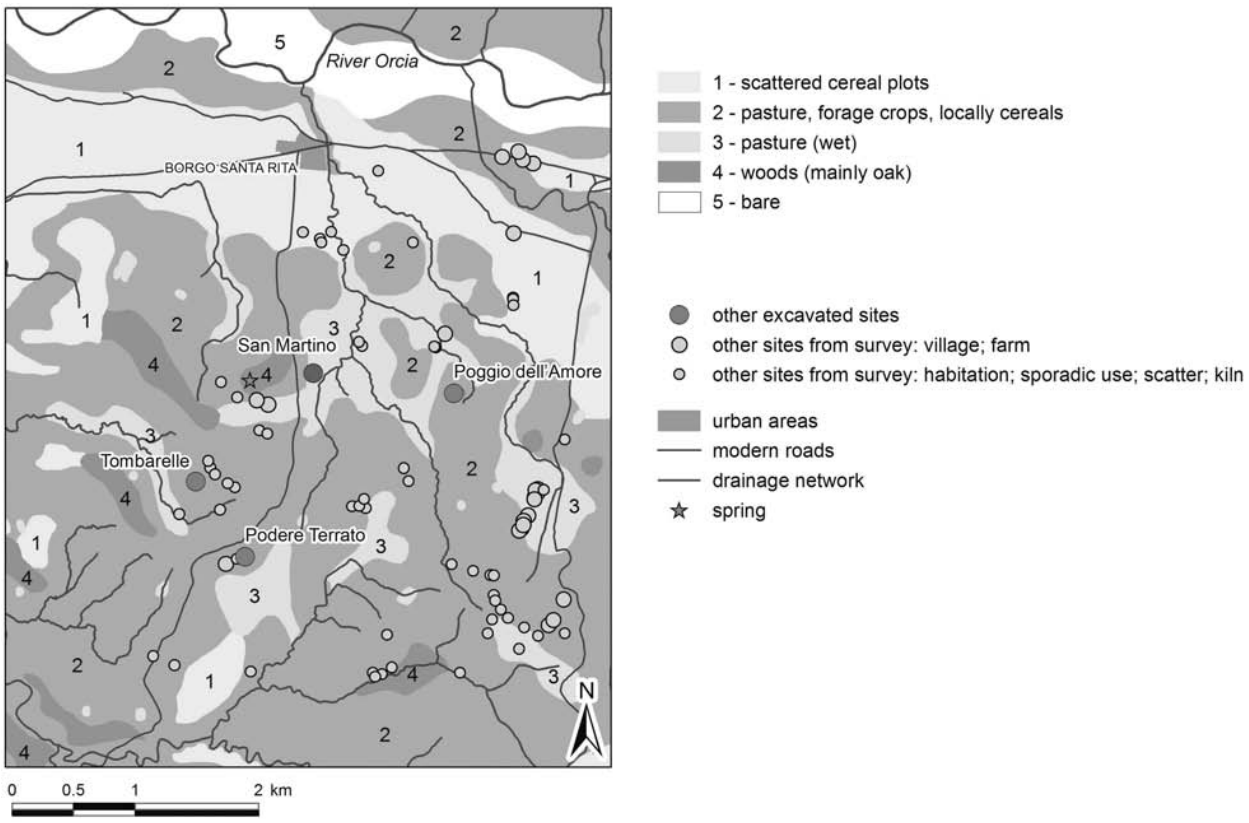


Fig. 13.9 Land use hypothesis for Marzuolo, San Martino, Poggio dell'Amore, Podere Terrato and Tombarelle (AA).

site and/or in the hills immediately to the E and W. Given their sparse traces in the pollen record, the olives should have been set further away, seemingly in the undulating S3 lands to the south whose stoniness would have made them hard to plow and, thus, more likely given over to tree crops. Given the importance of pasture (LPPI=41%) at least in the late antique phases of Case Nuove, much of the land labeled S1 or S2 should have been in partial or alternated use for pasture rather than "high-value" crops.

Both of these examples should be cautionary notes against any strict use of either dataset for "reconstruction" purposes. The excellent examples of archaeobotanical modeling done on Roman landscapes in the Netherlands and Britain have tended to be more optimistic about land use reconstructions largely by assuming one-to-one relationships between potential and actual use (Joolen 2003; Groot and Kooistra 2009; Rippon, Smart, and Pears 2015). As the contrasts between land suitability and pollen data from this project illustrate, Roman peasants did not always use highly suitable land for the most environmentally demanding crop. Good cereal land could be used partially or in alternation for pasture (see below); olive trees might be pushed into marginal lands, where cereal or pastureland was in short supply; while in cases like San Martino and Poggio dell'Amore, both located in prime land, most seeded crops might be eschewed in favor of a maintained, grazed pasture landscape.

13.5 Land Use, Distributed Habitation, and Intensified Agriculture (KB)

As we have seen in the above analysis, most of the sites found in the survey and excavated by the project lay in or near agricultural land suitable for cereal, fodder, or tree crops. As the above section has demonstrated, land suitability is an imperfect guide to how land was used, and a variety of cases find Roman peasants making decisions about the exploitation of land, which is at odds with its theoretical potential use.

The sites excavated by the project served often very disparate functions and were occupied for varying periods of time. We suggest in Chapter 12 that these represent a form of distributed habitation. The spectrum of time use varied from the month-long seasonal pressing site of Case Nuove, to the occasional stabling and overnight stops of San Martino or Poggio dell'Amore, to the longer-term seasonal industrial use of Marzuolo, to the multiple-months or year-long use of Podere Terrato or Pievina (see Fig. 12.25). This hypothesis of distributed habitation suggests that Roman peasants in this landscape moved around between sites, spending more or less time in these places depending on their function.

How this complex network of specialist sites worked is further illuminated by the data for land use. Laying the data for pasture, fodder, cereal, and grape/olive production against a rough order for the temporal spectrum of habitation, from sporadic to seasonal to permanent, reveals some important trends.

First, it is noteworthy that none of the sites on the sporadic end of the habitation spectrum (San Martino, Poggio dell'Amore, Colle Massari Romano), show cereals strictly grown nearby (Fig. 13.10). Conversely, those sites towards the more permanent end of the spectrum, Podere Terrato, Marzuolo Phases 2 and 3, and Tombarelle, all show a somewhat greater presence of cereal fields in the site's proximity. Cereal cultivation, therefore, clings to places with more intensive and/or longer human occupation, while land only visited occasionally is not typically used only for cereals.

These few instances of cereal accumulation show similar patterns. With the exception of Case Nuove, itself possibly a cereal processing site in late antiquity, all sites with probable or demonstrated cereal accumulation (Pievina, Marzuolo Phases 2 and 3, Tombarelle) lie at the more permanent end of the habitation spectrum. Furthermore, all except Case Nuove are quite large and all five show a relatively long site life. Notably absent among the sites with such accumulation are the smaller, more episodically occupied sites. Thus, not only are cereals grown near sites of longer-term occupation, but they wind up there as well, either for storage or processing.

Similar trends are noted for grape and olive cultivation (Figs. 13.11 and 13.12). The four sites that preserved the rare *Vitis* pollen—Case Nuove Phase 2; Podere Terrato, Marzuolo Phases 2 and 3—were, again with the exception of Case Nuove, on the more permanent end of the habitation spectrum (see Table 13.9). These were likewise the only sites to yield grape pips. Although we have noted above the

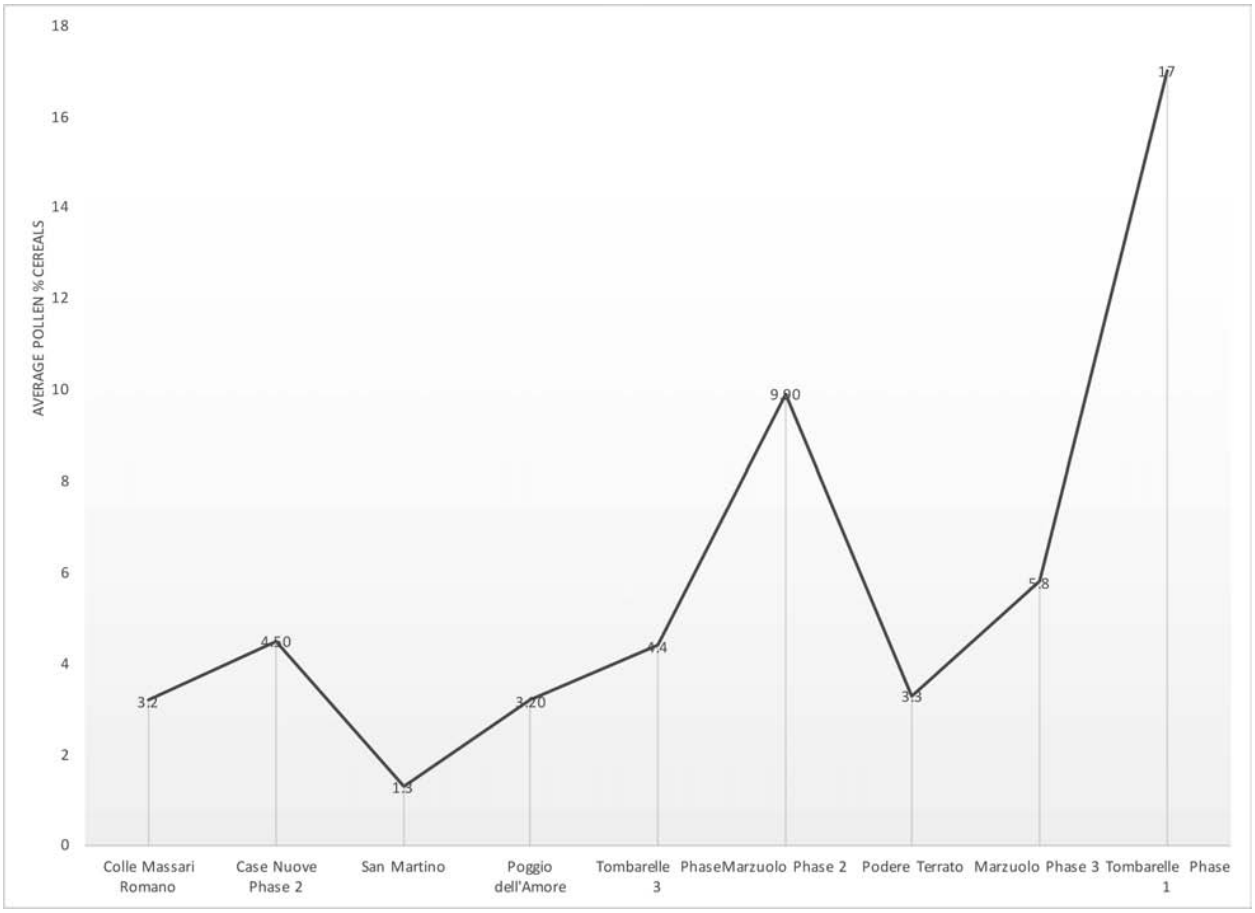


Fig. 13.10 Percentages of cereals pollen (averaged) along the habitation spectrum (time) (KB).

problems making sense of *Vitis* pollen data, it would suggest that, with the exception of the Case Nuove wine/oil processing site, vineyards were set near sites with more intensive occupancy. This parallels one of the few excavated peasant farms from Italy with published botanical data, S. Mario near Volterra, which had abundant evidence for nearby vineyards and small-scale wine production and would have sat far on the permanent end of our habitation spectrum (Motta, Camin, and Terrenato 1993; Motta 1997).

While, as noted above, olive pollen was found at five of eight sites, it was found in only small percentages (see Table 13.9). With the exception of Case Nuove, those sites on the lower end of the habitation spectrum tended to have olive pollen of less than 1%, suggesting that trees were not proximate to these sites. These sites produced almost no olive pips or seeds suggesting little consumption or processing on site.

Pasture, while a component of all site locales, was strongly associated with the sites on the episodic end of the habitation spectrum. Graphing excavated sites against LPPI shows, with the exception of Marzuolo Phase 3, that the sites on the more episodic end of the spectrum were set in zones with important areas of pasture, while those with more permanent occupation had variable proximate pasture (Fig. 13.13). Only one of the episodic sites, San Martino, showed more definitive evidence that such a site was used for pasture animal stabling. Poggio dell'Amore has somewhat fewer indicators but may well have had this function in addition to others. In the case of Colle Massari, we hypothesized that a pasture had been deliberately drained to prevent a natural pooling of water harmful to animals. Thus, some of the association between episodic sites and pasture may have been a direct one; these sites were linked functionally to the pasturelands in which they were built. For

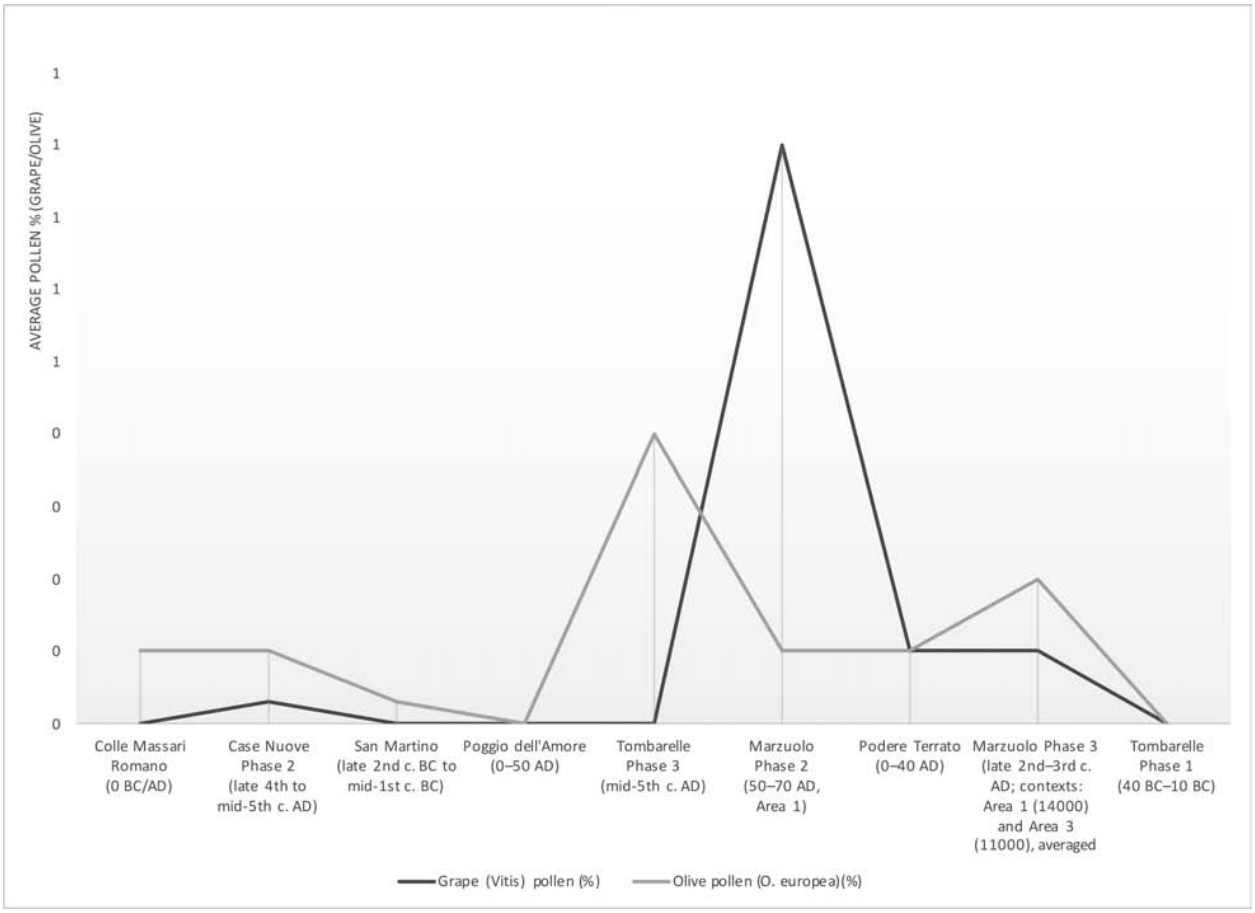


Fig. 13.11 Percentages of grape and olive pollen (averaged) along the habitation spectrum (time) (KB).

Table 13.9 Grape and olive indicators, including pollen and macroremains, all sites (AM/ER/RR).

Sites	Grape (*Vitis*) pollen (%)	Grape (*Vitis*) macro (total records)	Olive (*O. europea*) pollen (%)	Olive (*O. europea*) macro (total records)
Pievina	N/A	N/A	N/A	N/A
Case Nuove Phase 1.2	N/A	10(2)	N/A	9
Case Nuove Phase 2	0.03	267 (7)	0.1	27
San Martino	0	0	0.03	0
Poggio dell'Amore	0	3	0	0
Colle Massari Romano	0	0	0.1	0
Podere Terrato	0.1	1	0.1	0
Marzuolo Phase 1	N/A	2	N/A	1
Marzuolo Phase 2	0.8	46	0.1	3
Marzuolo Phase 3 (Areas 1 and 3 averaged)	0.1	14	0.2	1
Tombarelle Phase 1	0	0	0	11
Tombarelle Phase 2	N/A	0	N/A	0
Tombarelle Phase 3	0	0	0.4	0

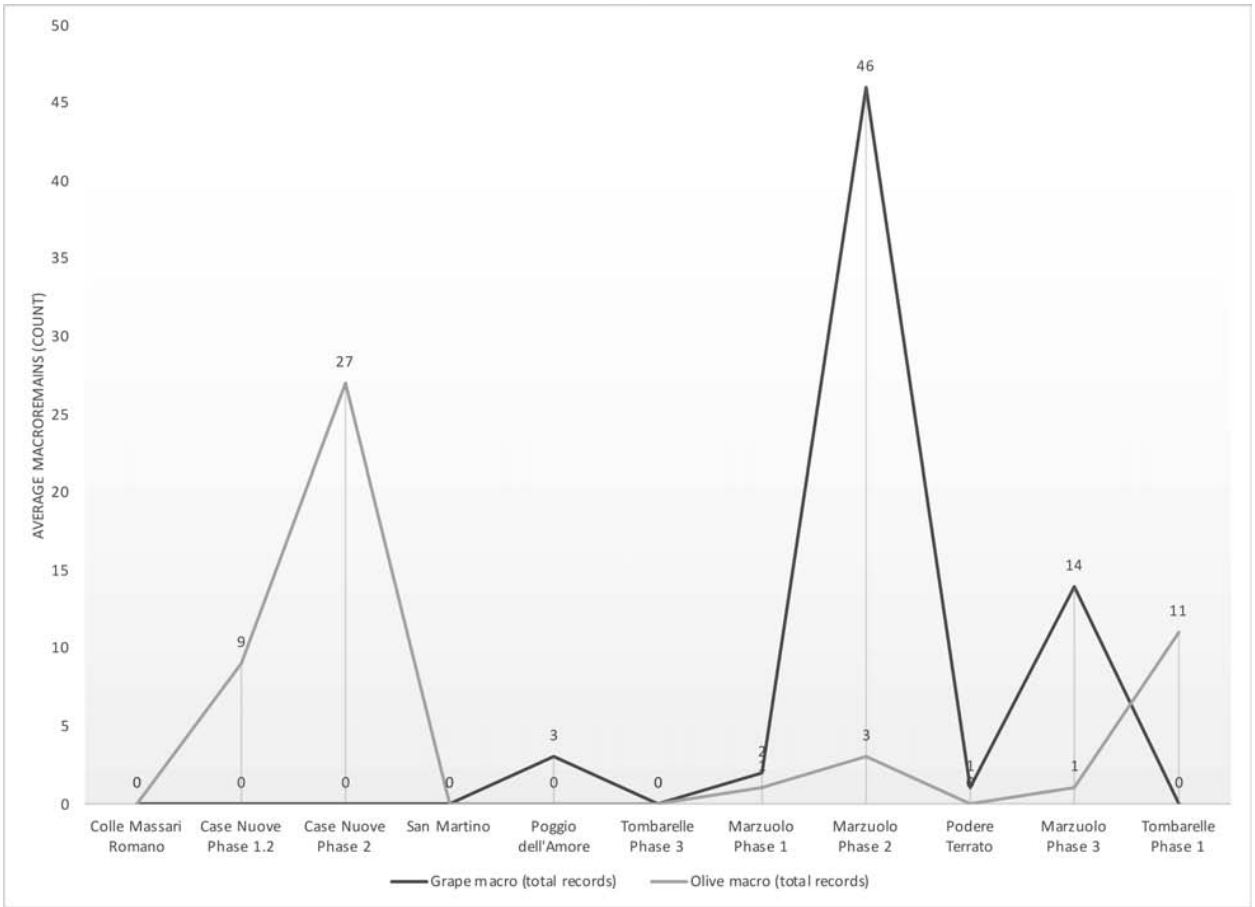


Fig. 13.12 Percentages of grape and olive macroremains along habitation spectrum (time) (KB).

others like Case Nuove, the relationship with pasture is more tenuous not least because of that site's olive/grape/cereal processing function.

For other food items, garden vegetables and wild fruit trees, the evidence is more ambiguous. A possible garden was identified only at Podere Terrato, while wild prune, hazelnut, and occasionally pear/apple were found near most sites.

On the whole then, the temporal spectrum of habitation seems to be strongly linked with land use in the locale: high value crops like cereals, olives, and grapes are cultivated near settlements with longer-term use, while pasture predominates everywhere, but particularly around sites with shorter-term use. A variety of reasons suggest themselves for this. Peasants may have invested more labor and oversight into cereals and vine particularly, leading them to place high value crops in places near where they spent the most time, or vice versa, land already allocated for use for high value crops attracted more permanent settlements for the same reasons (cf. Halstead 2014:191–199). In some cases, the structures may functionally relate to the land's use, i.e., small huts might be built for occasional animal stabling on land often used as pasture or pastureland might be drained to protect flocks.

A comparison of the survey data with the land units data suggests a similar specialized use of the land. The larger scatter categories (village and farms) are located in a wide variety of land units, preferencing the Upper Miocene sandy hills (Ks Land Unit) (23.5%) and the Miocene–Pliocene clays (Pa Land Unit) (25.5%) (Fig. 13.14). The smallest survey categories (habitation, scatter, sporadic) on the other hand, are placed overwhelmingly (47.4%) on the Miocene-Pliocene clays (Pa). These Pa units have particularly heavy, potentially hard to plow soils that, owing to their spring-saturated topography, tend to become waterlogged. Thus, in Hypothesis II above (see Fig. 13.2), they were rated S2 for arable crops and potentially

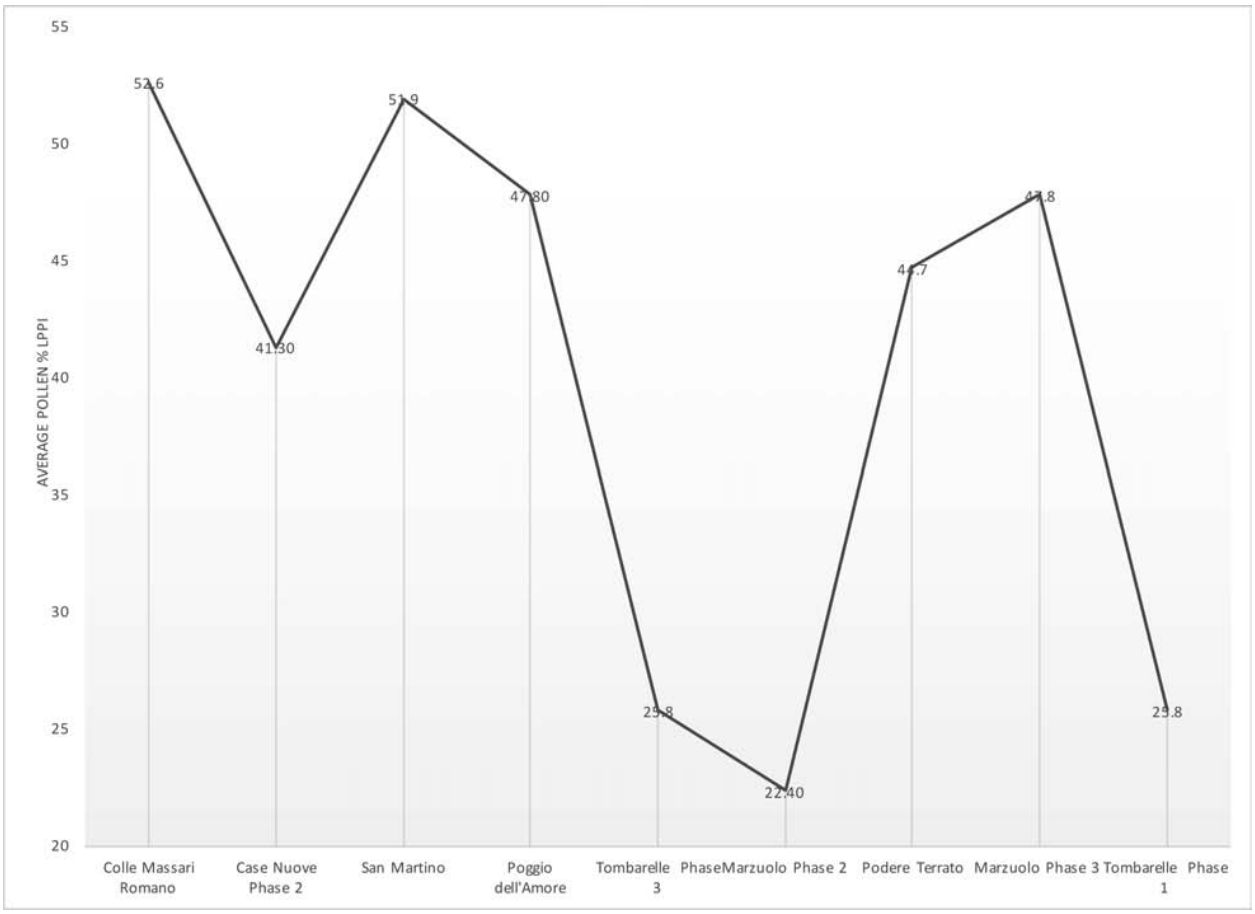


Fig. 13.13 Percentages of LPPI (w/ Cichorieae, averaged) along the habitation spectrum (time) (KB).

better for pasture. San Martino and Poggio dell'Amore, both located in or near these Pa Units and both seemingly used for pastoral functions, may suggest that many of the other, unexcavated smaller scatters were likewise used for such functions, and that much of the northern and central part of our locale where these units cluster was given over to pastoral uses.

This carefully distinguished use of different parts of the locale for different crops and the clinging of high-value arable crops to more permanent habitations recalls the infield-outfield systems used by Roman, medieval, and early modern peasants elsewhere in Europe (Rippon 2000, 2002) and as far afield as ancient Mesoamerica (Sanders 1981; Drennan 1988). A form of mixed farming, infield-outfield systems manage land near and distant from peasant homes in a differentiated system. Land near peasant homes are intensively worked for arable crops, while more distant fields are assigned more or less permanently to pasture. By reusing household garbage or manure collected in the outfield and/or using a rotation regime, the infield maintains its fertility. Infield/outfield systems have been detected archaeologically via differential manuring, with heavier manuring detritus located in the infield, or by wall systems separating infield and outfield.

None of these indicators for infield/outfield use is evident in the project area. The methodology used by Ghisleni, site-based rather than artifact density (cf. Carretè, Keay, and Millett 1995; Bintliff, Howard, and Snodgrass 2007; Haas 2011), was not designed to detect manuring per se. Thus, no field systems have been found here and, aside from centuriated landscapes, virtually anywhere else in Roman Italy (cf. Campana 2017). As discussed below, the likelihood that convertible agriculture was being practiced points to more flexible positioning of pasture than the infield-outfield system tends to entail. It seems

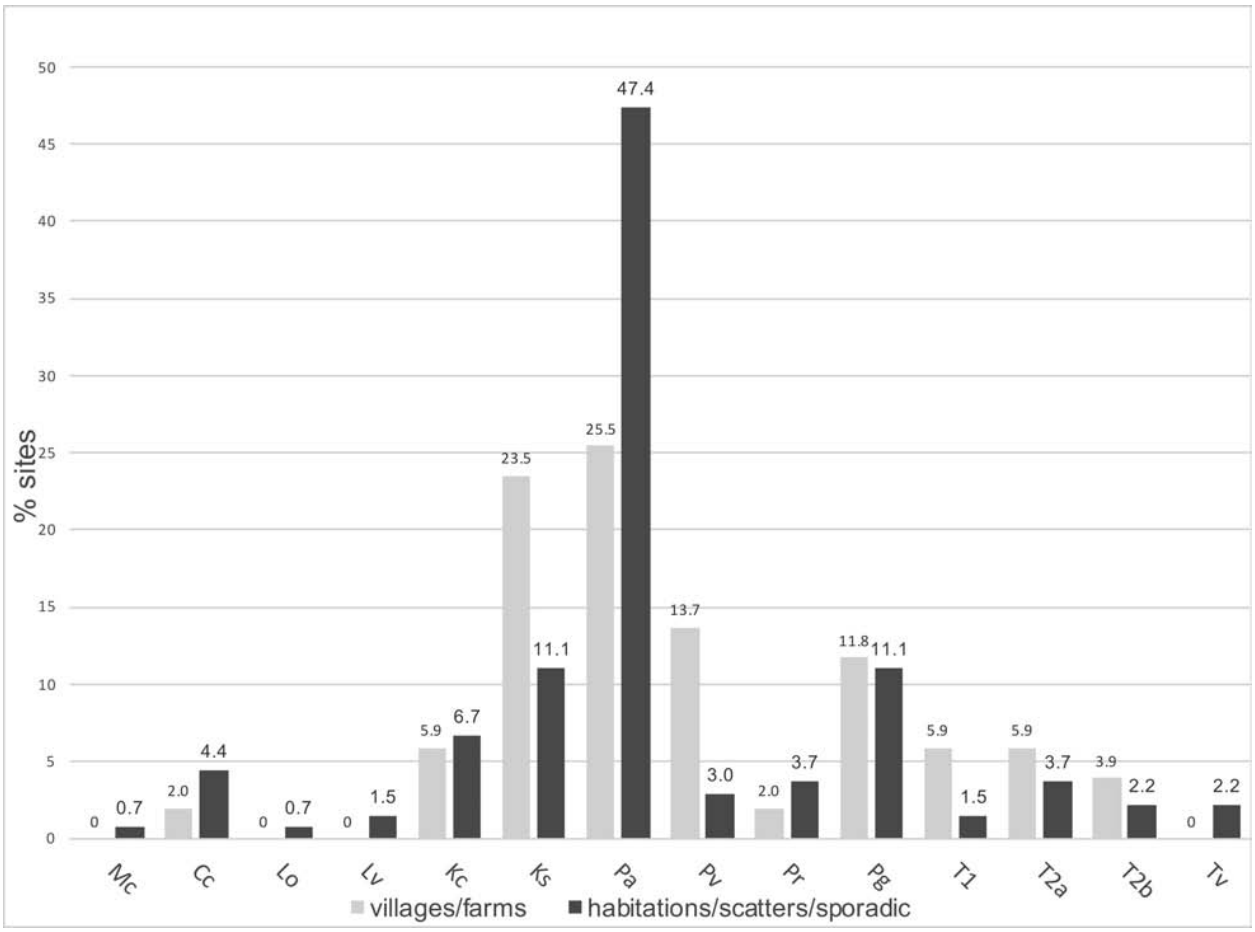


Fig. 13.14 Land units vs percentage of different survey categories from Ghisleni 2010 (AA).

unlikely that a strict infield-outfield system was employed, but the close relationship between arable crops/permanent habitations and pasture/episodic sites suggest at least the core principles of an infield-outfield system were in play.

Whether a regularized system or more ad hoc arrangement, it seems evident that all these sites and their diverse agricultural locales are linked. This specialized site/plant matrix presupposes that the same people are moving from site to site, depending on the nature of their work, the season, and crops/animals that were the objects of attention. A farmer sheltering flocks in San Martino for a period would have had to move to or indeed perhaps was based in contemporary grain-rich land near Tombarelle for cereals; similar relationships may have knit pastoral Poggio dell'Amore with contemporary and complementary activities at the "house" with garden at Podere Terrato and more seasonal specialized work at Marzuolo Phase 2. In no case does an individual site or its plant landscape give the impression of autarky; it is only through the movement from site to site and its particular agricultural locale that a whole peasant agricultural year can be constituted (see also Ch. 17).

This notion of a partible, yet interconnected agricultural practice matches with what we know of Roman landholding patterns (Vera 1986; Garnsey 1988:47–50). As noted in the previous chapter, both owners and renters of land tended to hold or farm disparate and often distant land parcels, rather than large contiguous parcels. This practice came about through a number of processes, including inheritance in which land was divided among heirs, as well as the desire to decrease risk and improve diversity by working land with differing ecological properties. The highly diverse central Italian and, indeed, Mediterranean landscape in which even proximate parcels might display dramatic differences in soil quality,

rainfall, sunlight, and temperature (cf. Horden and Purcell 2000; Forbes 2007) made diversified holding an essential, both for maximized productivity and risk mitigation in poor yield years.

Finally, the data from the project has revealed, particularly during the late Republican period, a particularly intensive version of this diversification strategy, in which the composite of household activities are spread out around the landscape, in which different agricultural regimes are specially attached to particular plots and in which specialized sites—from presses to stalls to drains—are built to accommodate these activities. Whether the product of an organized infield-outfield strategy or a more free-form arrangement, this phenomenon sees peasants making fine-grained decisions about agriculture and doubling down on the diverse potential of their locale. Those decisions will necessarily have been multidimensional and contingent, taking into account not only the different capacities of the various elements in that locale but also such factors such as travel time between and around them, and how to allocate the labor resources of the household in exploiting them. Here, too, we should expect immense variation operating at multiple temporal scales and consequently occasioning a suite of consciously made, finely grained decisions: which members of the household would be handed the task of managing the sheep, whether that be on their own or in cooperation with other members of the locale? How best to transact plowing and harvesting activities that needed to be effected at particular times and, in a context of dispersed landholdings, across a range of locations? How to respond when an unexpected rainstorm or flood rendered a particular path or routeway to a field, stall, or workspace unpassable? We return to the broader context within which these questions would have operated in Chapters 14 and 17.

A late Republican moment of agricultural intensification has been recently posited on archeological grounds, both in central Italy and, for an immediate post-conquest moment, in some of the provinces. When Italian field survey has included artifact density analyses, as was the case with the Pontine surveys (Haas 2011, 2012), increased manuring has been noted beginning in the 3rd–2nd c. BC and ending in the 1st c. AD, pointing to more intensive land use. Around Rome, new work on terracing and drainage has likewise shown an extraordinary moment of intensive use and landscape modification. Not only has this work revealed a number of large scale projects, probably associated with larger estates but, as with our own data, the same kind of interventions, particularly field drains, at a smaller scale (Quilici and Quilici Gigli 2009). Around Pompeii, new mapping work has likewise postulated a moment of intensive viticulture-oriented agriculture beginning in the late Republic and ending in the 1st c. AD (Simone 2017). In northern France, the large-scale rescue excavations have revealed in detail an expansion of small farms, more robust manuring strategies, a rash of new granaries, new drainage schemes, and the expansion of agriculture into newly occupied lands which all point to a major moment of intensification beginning already in the late Iron Age and building after the Roman conquest (Ouzoulias 2014; Ferdière 2015; Reddé 2016b). The project's data adds further detail to this growing picture by demonstrating how central Italian peasants of the late Republican/early imperial periods employed distributed habitation strategies to make better use of distant plots, share agro-processing technology and micromanage the land's hydraulic potential.

13.6 Crop Rotation: Evidence and Implications (AMM, KB)

At both late Republican and late antique sites where grain fields were observed in the pollen record at greater than 1.5%, the coincident quantity of fodder crops, as well as the important presence of pasture suggests the possible practice of crop rotation (Table 13.10, Figs. 13.15–13.16). In all sites with at least moderate quantities of cereal pollen, the mean percentage of fodder/legumes and cereals is very similar (e.g., 4.5/4.5% in Case Nuove, 3.4/3.2% in Poggio dell'Amore, 2.7/3.3?% Podere Terrato, 3.6/4.4% Tombarelle Phase 3). Despite the different productivity and phenology of these plants, the pollen data suggest that a similar importance was given to these crops. At sites with very high percentages of cereal pollen (Marzuolo Phases 2 and 3 and Tombarelle Phase 1) fodder/legumes are present at moderate levels but not approaching those of cereals. It should be noted that at Marzuolo Phase 3/Area I and Tombarelle Phase 1, the high cereal numbers have been

tentatively attributed to cereal accumulation on-site, which may also help explain the disparity between cereals and fodder quantities. Regardless, the consistent ratios of cereal/fodder at half the project sites/phases to have produced significant quantities of cereal, and the consistent presence of fodder/legumes in the rest, all suggest that grain and fodder were cultivated in adjacent fields and were probably rotated to regenerate soils.

Crop rotation involves the cultivation of nitrogen-demanding crops, such as cereals, in sequential alternation with nitrogen-fixing crops, such as leguminous fodder crops. Such rotation can be carried out in adjacent fields (two-field crop rotation) or within the same field. Tripartite crop rotation, or ley agriculture, introduces a pasture element into this sequence in which the field is cultivated as pasture by seeding pasture grasses and/or weeding invasive species. The pasture is either used for grazing, or mowed as hay, or both. This longer periodicity of ley (3–6 years) allows soil nutrients to return, a process that is accelerated when land is grazed and manured, while also supporting animal herds.

A recent resurvey of the textual sources has suggested that Roman farmers knew about the benefits of rotation and that at least elite farmers practiced ley agriculture (Kron 2000; cf. Spurr 1986). Kron's argument is based on a detailed exposition of the vocabulary for rotation used in the texts of Cato, Varro, and Columella; *restibilis* to describe land used in arable cultivation, principally of cereals, and *novalis* or *veteretum* as either sown with fodder crops or maintained as cultivated pasture. As Kron has argued, this vocabulary presupposes a tripartite rotation of grain, leguminous fodder crops, and cultivated pasture, which, while never defined explicitly, sits behind all three agronomists' most basic assumptions about the use of land. The use of a specific and consistent technical vocabulary to describe land in different phases of rotation likewise suggest a deeply seated, widely accepted praxis. Kron's work also emphasizes the importance of *cultivated* pasture in the key rotation, the techniques used to improve pasture by seeding, plowing, weeding, and water mitigation, and the agronomists' long excursus on both fodder and hay as crops of the same importance as cereals.

The paucity of detailed, published botanical studies from Roman rural sites has meant that Kron's hypothesis has had little physical verification. The closest evidence from Italy comes from earlier periods in the north where a crop rotation involving legumes and cereals, possibly with some fallow periods, has

Table 13.10 Cereal, fodder/legumes and LPPI (w/out Cichorieae) pollen percentages, all sites (AM/ER/RR).

Sites	Cereal (% pollen)	Legumes/Fodder (% pollen)	LPPI (w/out Cichorieae) (% pollen)
Pievina	N/A	N/A	N/A
Case Nuove Phase 1.2	N/A	N/A	N/A
Case Nuove Phase 2	4.5	4.5	7.6
San Martino (in-site)	1.3	5.8	7.6
Poggio dell'Amore (in-site)	3.2	3.4	11.7
Colle Massari Romano (in-site)	3.2	1.4	11.7
Podere Terrato	3.3	2.7	13.1
Marzuolo Phase 1	N/A	N/A	N/A
Marzuolo Phase 2	9.9	3.9	18.5
Marzuolo Phase 3 (Areas 1 and 3 averaged)	5.8	2.8	12.5
Tombarelle Phase 1	17.0	1.7	6.9
Tombarelle Phase 2	N/A	N/A	N/A
Tombarelle Phase 3	4.4	3.6	10.3

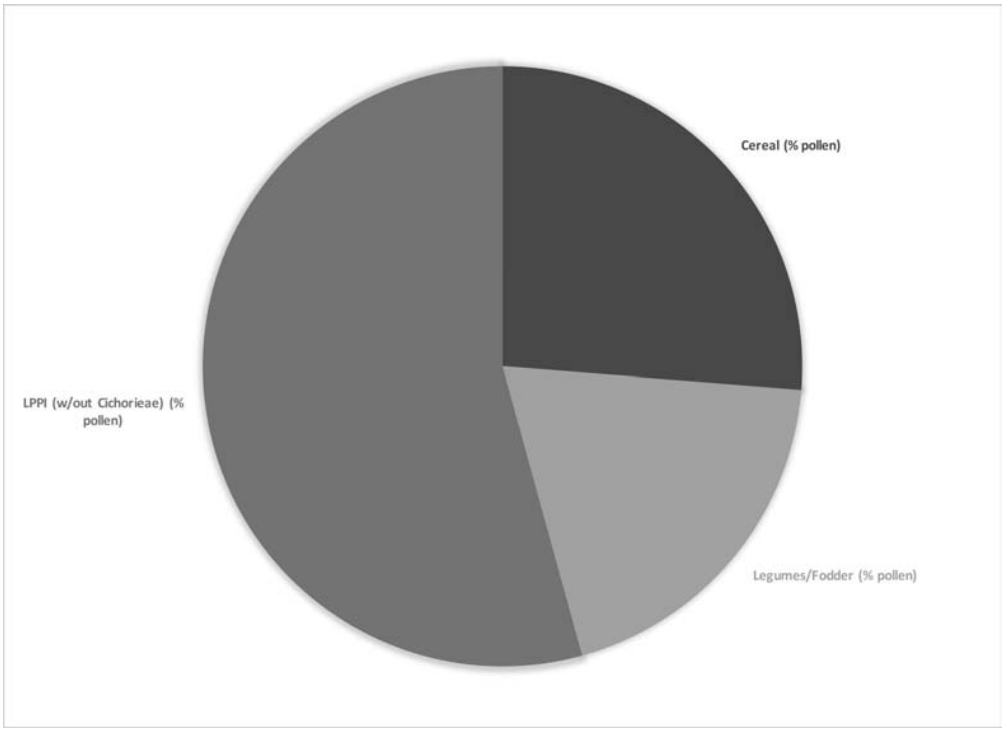


Fig. 13.15 Cereal, fodder/legumes and LPPI (w/out Cichorieae) pollen percentages, late Republican sites (AM/ER).

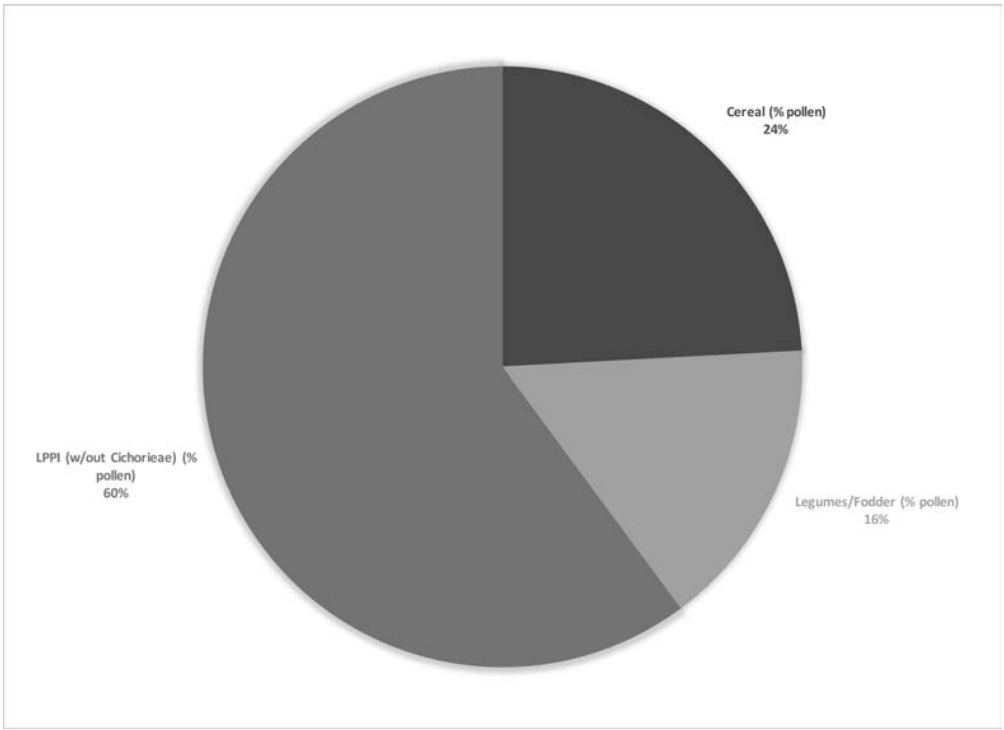


Fig. 13.16 Cereal, fodder/legumes and LPPI (w/out Cichorieae) pollen percentages, late antique sites (AM/ER).

been hypothesized for the Terramare culture living in the Emilian Po Plain during the Middle–Late Bronze Age (Mercuri et al. 2006; Cremaschi et al. 2016). Recently, new data from large-scale rescue excavations in northern France have documented the inclusion of legumes alongside a shift to naked wheats in the 1st c. AD (Matterne 2003; Zech-Matterne, Weithold, and Pradat 2014; Bernigaud et al. 2015), strongly pointing to legume rotation employed to mitigate soil nutrient loss by this most "greedy" of newly introduced cereals. In parts of Devon in England, pollen data showing arable cultivation alongside large areas of improved pasture has been used to argue for the advent of convertible agriculture there sometime between 700–800 AD (Rippon, Fyfe, and Brown 2006). Similar data from Roman central Italy has thus far been lacking, although some Pompeiian data has been interpreted as such (Ciaraldi 2007:155).

There are a number of mitigating factors to consider when evaluating the physical evidence of rotation. The first is the nature of the pollen palimpsest: the cores sampled from individual archaeological contexts represent the pollen rain accumulated throughout the whole of that context's chronological span. Thus, the mixture of cereal, nitrogenous and pasture pollen found therein cannot be isolated into finer grained moments, like individual years or seasons. As a pollen core represents the pollen rain over a whole locale, it is likewise impossible to distinguish adjacent or even somewhat distant fields of different crops grown simultaneously from crops grown in the same space in rotation. Given the differential rates of pollen production and dispersion, the admixture of cereal, leguminous, and pasture pollen cannot be used to determine respective percentages of each and/or rates of rotation: cereal pollen, for instance, is large and not easily transported by wind, while many pasture pollen grains like Cichorieae are highly durable and may be overrepresented. Finally, the fodder crops might be deliberately sown into pasture fields, not arable land, and, thus, appear in the pollen spectrum in this way. Indeed, some of the agronomists recommend this method for cultivating fodder, even as they also recommend arable rotation strategies (Kron 2004).

All of these limitations on the evidence make it impossible to be more certain about the presence of rotation in the project's data or to provide any specifics as to its frequency or character. That being said, the consistent presence of leguminous fodder plant pollen together with cereals in nearly all the data collected strongly suggest that some form of rotation was being practiced in the area.

In our samples, legumes cultivated for fodder (including e.g., *Trifolium*, *Lotus, Hedysarum, Dorycnium*) are common and well represented; considering that they are low-producing and low-represented pollen grains, their values are so high that the presence of extended fields (for periodic mowing) next to the sites is highly probable. Fodder legumes (like lentil) were also found as macroremains reinforcing the idea of a crop rotation of these two types of fields. Edible legumes, including lentils and broad beans, are much less common and we should imagine that the nitrogenous portion of the rotation was destined principally for animal consumption.

The high LPPI indicators that accompany the cereal and fodder percentages are also important to note in this context. These LPPI indicators tabulate species that flourish under grazed conditions (see Ch. 2) and the index is used as a proxy for the presence of animals. The presence of field drains at Poggio dell'Amore and Colle Massari may have been used to drain land that was periodically used as pasture, water control being another component of cultivated pastures (cf. Spurr 1986:20, 57–58).

Moreover, the high indices of local pastoral practices (LPPI) found together with cereal and fodder crops further suggests a rotation between arable fields, cultivated meadows for grazing, and nitrogen-fixing fodder crops. That said, as noted above archaeobotanical data cannot reveal the duration of the rotation, that is, a yearly or three-yearly rotation, nor does it indicate if the rotation was used in all lands or only in some specific sectors.

The implications for possible rotation practices on our understanding of Roman agriculture are significant (cf. Spurr 1986; Kron 2000, 2012a). Attempts to calculate Roman wheat yields have produced inconclusive results, with modern scholars divided between a range between 4 to 15:1 (see Spurr 1986; White 1970; Brunt 1971; Evans 1981; Duncan-Jones 1982; Goodchild 2007). Most of the modern assessments assume that Romans practiced alternate fallowing, leaving much of their land empty in any given year so as to avoid depletion of soil resources. Such assessments have often delivered relatively pessimistic assessments of Roman agricultural productivity,

particularly for small farmers for whom alternate fallow periods would have been a major strain on limited land resources.

Rotation schemes may have increased wheat yields, although not perhaps as much as optimistic assessments have assumed (cf. Kron 2000). Modern studies in Mediterranean soils/climate have documented modest yield increases (0–20%) with rotation versus fallowing, less dramatic than in temperate climates (López-Bellido et al. 1996; Ryan et al. 2010; Stagnari et al. 2017). In modern rainfed crops, water, rather than nitrogen, is the primary factor determining yields, particularly rainfall during the wheat's vegetative phase from November to February—the period when our locale receives the majority of its precipitation. In years with comparable rainfall, conservation tillage practices that retain water, as well as rotation with fava beans, have been shown to produce similar or slightly higher yields than fallowing (López-Bellido et al. 1996; Stagnari et al. 2017). Rotation has, however, been shown to have produced notable improvement in soil microbial and nitrogen levels, while reducing the pest buildup that occurs when only one type of crop is repeatedly grown. When rotation integrates animals, grazing either on stubble or rotated pasture, the resultant manure likewise replaces plant nutrients, although studies have shown variable impact from stubble grazing strategies (Ryan et al. 2010 cf. Kron 2000).

The most notable impact of rotation practices versus fallowing was probably an effective increase of the overall system productivity of the land. Whether with the fodder legumes that dominate the pollen spectrum, the less abundant cereal legumes or the pasture rotation, the peasants in our locale would have had significantly increased the caloric value of their land through rotational strategies. That assignment of much of that caloric value to animals seems likely: the majority of the legume pollen is from fodder plants and, as discussed in more detail below, much of the overall pollen spectrum represents grazed pasture. An investment in animal husbandry and the use of animals as caloric storage would seem to be the principal benefit of a rotation practice (cf. Halstead 2014).

The suggestion that even these smallholders may have had the technical know-how to rotate cereals, leguminous crops and pasture also suggests considerably greater knowledge of soil preservation than has been previously accorded them. Indeed, skepticism about Kron's proposals for Roman knowledge of rotation schemes have not centered on whether or not they knew of such schemes, but how widespread they were (Scheidel 2008; Ligt 2012). Leaving aside the yields question, in terms of the demographics of practicing rotation, our project suggests that such practices extended all the way down the socioeconomic spectrum and the Gallic data suggests the same (see above). Rotation schemes also imply a relatively long-term strategic management in which multiple-year cycles are planned out in advance and the different crops and capabilities of multiple, probably disparate, even distant plots are coordinated.

13.7 Pasture, Mixed Farming and Its Implications (KB)

One of the implications of employing a tripartite rotation system is that significant quantities of pasture are included in the rotation cycle, and over not-inconsiderable periods of time. The importance of pasture in both a possible rotation system, and more generally in the project area, deserves discussion.

Pasture species form a major component of the pollen spectrum of almost every site/phase investigated (see Table 13.6). As discussed above, there are a series of pollen production, dispersal and preservation issues that may skew the record towards overrepresentation of pasture pollen, particularly Cichorieae. These caveats in place, pasture nonetheless remains a major component of the study landscape.

The field drains found in the study (Colle Massari Romano, Podere Terrato, Pievina), likewise point to careful management of those pasture-heavy landscapes. Draining pasture promoted even grass growth and removed stagnant pools which might accumulate harmful parasites. Even the agronomists had much to say on field drains, their proper maintenance and their critical role in maximizing herd health (Columella, *Rust*. 2.8–10; Cato, *Agr*. 155; Pliny *NH* 18.179).

As noted above, in most cases, the pasture record includes indicators for grazed as opposed to simply wild or abandoned land. Similarly, in all sites, the presence of coprophilous fungi and parasite eggs are

strongly indicative of excrements of ruminants. That is, the significant presence of pasture implies an important presence of pasture animals.

Recent work has drawn attention to the importance and quality of Roman pasture plants as part of a mixed agricultural regime in which pasture animals were a critical component. The very high quality of Roman fodder, which in both agronomist texts and the few extant botanical remains includes a wide mixture of the Fabaceae and Poaceae, is regarded as a critical component in expansion of animal husbandry and the increase in breed size documented throughout much of late Republican and imperial-period Italy (Kron 2002, 2004). The importance of pasture at all levels in Roman agriculture should be tied to the importance of animal husbandry, at the base of the development of the Mediterranean landscape and of the Italian agricultural tradition and products (milk and many different cheese types) continuing up to recent centuries.

In our project data, however, we find a contrast to the secondary, botanical evidence for pasture animals in the lacunose primary evidence of the faunal remains. Many of the sites excavated by the project had very small faunal collections, particularly those sites on the episodic end of the habitation spectrum (see Table 12.1). While this could indicate that the grazed pasture observed in the pollen spectra is not coincident with pasture animals, it is perhaps more likely a product of the function of the sites excavated. The sites occupied more episodically tend to have no built cooking facilities, making meat consumption more challenging. That is, animal consumption and animal dietary waste is likely to be underrepresented at these sites. The rubbish dumps which are the principal source of most of the larger faunal collections are likewise largely absent in these sites, for reasons we discussed in Chapter 12. Finally, all the sites on the more permanent end of the habitation spectrum have notable faunal remains, indicating that where more permanent occupation happened, animals were present and being consumed.

If we can assume that, despite the problems of the faunal evidence, the pasture landscapes of the project area seem to have carried pasture animals, again the implications for our understanding of peasant agriculture systems are important. An earlier generation of scholarship downplayed the roles of animals in Roman peasant economies; it was assumed that animals were too calorically "expensive," too inefficient a use of limited and presumably underproductive lands to be the object of peasant investment (Garnsey 1988, 1999; Jongman 1988). Evidence for the borrowing, sharing, or partial ownership for large animals such as horses, donkeys, or cattle (cf. Lirb 1993; Grey 2011) would seem to support this. The poor have, thus, been sometimes imagined as quasi-vegans as a result of an absence of animals in their productive and diet regimes.

Recent work relying on large faunal datasets has revised these assumptions, demonstrating the importance of animals to large and small scale mixed-agriculture. In the Netherlands, Roman period farming villages have been shown to have produced both grain and cattle for sale on the market, integrating cereals and fodder via an intensive manuring scheme (Groot et al. 2009). Closer to home in Italy, analysis of Roman faunal data show a deliberate effort to increase the size parameters of all the major domesticates (MacKinnon 2001, 2010, 2015), particularly cattle. These datasets are drawn from large and small sites, urban and rural, pointing to Roman peasants' participation in a widely shared emphasis on animal economies as part of an intensive mixed farming strategy. Cattle breeding particularly, where in central Italy cattle size increases some 90% over the late Republican/early imperial periods, points to not only breeding strategies but also agricultural schemes for fodder production that would sustain those breeding programs (MacKinnon 2010). A variety of indicators (Kron 2002, 2005b, 2012a; cf. Sallares 2007) suggest that animals formed a far more critical component of general agricultural strategy than formerly assumed and that the project's pollen evidence for managed, grazed pasture and fodder production is part of a shared emphasis on animal economies.

Cattle appear as a significant presence in our sites, particularly in the earlier (late 2nd c. BC–late 1st c. BC) Tombarelle Phase 1, Marzuolo Phase 1, and Case Nuove Phase 1. These were mostly noted to be older specimens and almost certainly used as traction until they became too old for the plow. Size ranges among these cattle are comparable across sites, moreover, as is a level of attention devoted to these animals; pathological conditions are rare. Evidence suggests that they served similar functions regardless of location. The use of animals for traction in Roman peasant systems has been sometimes dismissed, alleging that the

expense was too great and that plows must have been human-drawn (White 1970:345; Jongman 1988:83–84; Sallares 1991:312; cf. Halstead 1987). The evidence here suggests the contrary, namely that either as wholly owned or shared assets, cattle were used for plowing. Animal drawn plows are obviously more robust and efficient and more capable of managing the heavy clayey soils that comprise much of the project area. Nevertheless, even with the use of animal plows, no doubt human labor was also applied, in the use of hoes, digging sticks and other implements.

Pasture animals, particularly the sheep and goat which are common on our sites, serve as mobile storage for both meat and milk, available 365 days per year although seasonal culling is more desirable. This on-the-hoof storage can supplement seasonal shortages in plant-based calories. Sheep and goat husbandry is somewhat flexible, applicable in a variety of ecological and cultural niches. Flocks do not necessarily rely on any specially reserved pasture, but can adapt to multiple terrains and environments—rough, dry, wet, hilly, flat, scrub, etc. Moreover, pastoralism can surpass, even replace, agricultural activity when the latter becomes precarious or unproductive due to ecological, economic (e.g., recession), and cultural (e.g., political, warfare, etc.) factors. Nevertheless, although a component of pastoralism serves a key purpose, there is still perhaps no decisive value to specialize completely in that aspect, given the diversified and seasonal needs of peasant households.

Finally, like the rotation strategies mentioned above, the important admixture of animals into peasants' agricultural strategies implies a longer, more strategic view than has often been accorded them. Animals represent a long-term investment which defies a strict energy calculus. While the caloric yield to cost ratio from animal proteins is much lower than that for plants, animals, as we have seen, also give back to that energy system through manuring, and store that energy over multiple years. Animals are also mobile and can adapt well to variable conditions, particularly in the case of sheep and goats, the animals that might arguably travel the longest distances among the range of herding schemes implemented among peasant husbandry. As already signaled in the preceding paragraphs, cattle provide a source of labor at crucial times in the agrarian calendar. Here, in addition to their employment in plowing, we may imagine the transportation of crops for processing, storage, distribution, or sale. Finally, for a farming system which seems to have exploited multiple distant plots simultaneously, animals are transportable and a farmer could take his valuable animal assets with him while moving between different fields.

13.8 Animal Husbandry Strategies (MM)

Animal husbandry strategies influenced not only which animals were kept, but also the demographic profile and composition (i.e., ages, sexes, breeds, health, etc.) of those animals (Tables 13.10–13.16). Cultural, biological, ecological, and environmental factors determined how these schemes are expressed in the faunal record. The zooarchaeological data for the project overall was rather scarce: most sites yielded relatively small collections and some none at all. Given the challenges of the data, coupled with levels of flexibility and variety inherent in all animal husbandry schemes, reconstructions of those schemes is particularly challenging.

Late Republican/early imperial phase faunal materials derive from the sites of Pievina, Case Nuove, Tombarelle, and Marzuolo, while zero or small quantities of materials were found at San Martino, Poggio dell'Amore, and Podere Terrato (Table 13.11). All of these samples (save that from Marzuolo) are small and statistically problematic. Moreover, the contexts of recovery are varied among each, further complicating assessments. Materials from Case Nuove display marked variability, with bones and teeth of older cattle more plentiful within the scrappy assemblage from mixed 1st c. BC deposits (presumably a taphonomic aspect), while young pigs, ovicaprids, and domestic fowl dominate the assemblage from the "basin fill" context at this same site. Pigs comprise the bulk of the Pievina assemblage for this period, but the age structure for them at this site is much more variable than at Case Nuove, and domestic fowl are very infrequent. Cattle and red deer dominate Republican-phase materials from Tombarelle, while pigs and cattle comprise the bulk of the assemblage from Marzuolo. Thus, these late Republican/early imperial assemblages are characterized above all by variability.

Table 13.11 Faunal remains, all sites, NISP relative frequencies for consumed taxa (MM)

Site	Date century	NISP total (cattle+sheep/goat+pig)	% Cattle	% Sheep/Goat	% Pig	NISP of other principal mammalian and avian taxa present (only typically consumed taxa listed)
Case Nuove Phase 1.1	1 BC	14	50	21.4	28.6	1 red deer, 1 roe deer, 14 domestic fowl
Marzuolo Phase 1	1 BC	310	32.6	19	48.4	12 domestic fowl, 4 red deer, 3 wild boar, 1 other avian
Tombarelle Phase 1	1 BC	36	58.3	19.4	22.2	17 red deer, 4 wild boar
Pievina Phase 1	1 BC–1 AD	23	13	26.9	60.9	1 red deer, 1 hare, 1 domestic fowl
Case Nuove Phase 1.2	1 BC–1 AD	73	—	34.2	65.8	35 domestic fowl, 3 song thrush, 3 galliformes
Poggio dell'Amore	1 AD	4	—	100	—	—
Podere Terrato	1 AD	—	—	—	—	
Marzuolo Phase 2	1 AD	100	14	43	43	10 domestic fowl, 6 red deer, 1 hare, 5 other avian
Tombarelle Phase 2	1 AD	7	28.6	71.4	—	—
Marzuolo Phase 3	2–3 AD	138	17.4	31.9	50.7	13 domestic fowl, 2 red deer, 2 hare, 5 other avian
Case Nuove Phase 1.3	2–3 AD	5	—	20	80	14 domestic fowl, 1 red deer
Pievina Phase 2.1 and 2.2	4–5 AD	269	22.3	42.8	34.9	6 wild boar, 2 red deer, 1 roe deer, 2 domestic fowl
Case Nuove Phase 2	4–5 AD	174	18.3	45.9	35.3	13 red deer, 20 domestic fowl
Tombarelle Phase 3	5 AD	80	46.3	20	33.8	2 domestic fowl, 1 wild boar
Tombarelle Phase 4	10–11 AD	25	8	68	24	1 domestic fowl, 1 red deer
Marzuolo Phase 4	11–12 AD	31	16.1	48.4	35.5	4 red deer, 1 hare
Case Nuove Phase 3	13 AD	20	—	40	60	1 domestic fowl, 69+ hare, 1 red deer, 1 roe deer

This variability must be, in part, a product of the functional diversity of these sites. Inherent differences may be expected more readily when one compares deposits presumably associated with different complexes of activity and purpose, in this case a "farm" (e.g., Pievina), a pressing site (e.g., Case Nuove), seemingly two artisanal production sites (e.g., Marzuolo, Tombarelle), and temporary work/stabling points (e.g., San Martino). Nevertheless, even with this caveat in place, peasant strategies themselves may promote a level of variability as to how animal taxa are integrated into sites.

It is also possible to imagine that variability as a product of the distributed habitation system. Assuming that the different sites in the project worked in complementary fashion with one another, the variability could be a result of different sites "specializing" slightly in certain species. Given, as noted above, that land use patterns also varied along the spectrum, it might stand to reason that animal husbandry patterns might vary as well, with sites adjacent to grain fields being higher in cattle for plowing (e.g., Tombarelle Phase 1), and those near land more frequently in use for pasture being richer in sheep/goats. At present, the data set is not robust enough for this to be anything more than a hypothesis, but this hypothesis is consistent also with conclusions derived from our study of mobility in this locale (below, Ch. 17). It is interesting to note, for example, that when examined as a group, the variations in the individual site's species mix even out and approach the average for the region as a whole (Figs. 13.17, 13.18,

text continues on p. 505

Table 13.12 Faunal remains, all sites, MNI by taxon, age category and site (MM).

		CATTLE			SHEEP/GOAT			PIG		
		juvenile	subadult	adult	juvenile	subadult	adult	juvenile	subadult	adult
Site	Date century									
Case Nuove Phase 1.1	1 BC	—	—	1	—	1	—	—	—	1
Marzuolo Phase 1	1 BC	—	2	5	1	1	3	1	2	4
Tombarelle Phase 1	1 BC	—	—	2	—	1	1	—	1	1
Pievina Phase 1	1 BC–1 AD	—	—	1	—	—	1	—	1	1
Case Nuove Phase 1.2	1 BC–1 AD	—	—	—	1	1	1	1	2	—
Poggio dell'Amore	1 AD	—	—	—	—	—	1	—	—	—
Podere Terrato	1 AD	—	—	—	—	—	—	—	—	—
Marzuolo Phase 2	1 AD	—	—	2	1	1	2	1	1	1
Tombarelle Phase 2	1 AD	—	—	1	—	—	1	—	—	—
Marzuolo Phase 3	2–3 AD	—	1	1	1	2	2	—	3	2
Case Nuove Phase 1.3	2–3 AD	—	—	—	—	1	—	1	1	—
Pievina Phase 2.1 and 2.2	4–5 AD	—	1	2	1	1	4	1	4	3
Case Nuove Phase 2	4–5 AD	—	2	1	1	1	4	2	3	—
Tombarelle Phase 3	5 AD	—	1	3	—	—	3	1	2	4
Tombarelle Phase 4	10–11 AD	—	—	1	3	—	—	2	—	—
Marzuolo Phase 4	11–12 AD	—	—	1	—	1	2	1	1	1
Case Nuove Phase 3	13 AD	—	—	—	1	1	—	1	1	—

Table 13.13 Faunal remains, all sites, cattle, relative frequency by skeletal part category, calculated on the basis of NISP and MNE (MM).

Cattle		NISP					MNE				
		n	1°	2°	ext.	head	n	1°	2°	ext.	head
Site	Date century										
Case Nuove Phase 1.1	1 BC	**7**	—	14.2	—	85.7	**2**	—	33.3	—	66.7
Marzuolo Phase 1	1 BC	**94**	35.1	12.8	31.9	20.2	**16**	37.5	18.8	25	18.8
Tombarelle Phase 1	1 BC	**21**	19	4.8	33.3	42.9	**4**	25	25	25	25
Pievina Phase 1	1 BC–1 AD	**3**	—	33.3	—	66.7	**2**	—	50	—	50
Case Nuove Phase 1.2	1 BC–1 AD	**—**	—	—	—	—	**—**	—	—	—	—
Poggio dell'Amore	1 AD	**—**	—	—	—	—	**—**	—	—	—	—
Podere Terrato	1 AD	**—**	—	—	—	—	**—**	—	—	—	—
Marzuolo Phase 2	1 AD	**14**	7.1	14.3	28.6	50	**5**	20	20	20	40
Tombarelle Phase 2	1 AD	**2**	—	—	50	50	**2**	—	—	50	50
Marzuolo Phase 3	2–3 AD	**24**	16.7	4.2	29.2	50	**5**	20	20	20	40
Case Nuove Phase 1.3	2–3 AD	**—**	—	—	—	—	**—**	—	—	—	—
Pievina Phase 2.1 and 2.2	4–5 AD	**60**	13.3	10	31.7	45	**8**	37.5	12.5	25	25
Case Nuove Phase 2	4–5 AD	**32**	3.1	6.3	—	90.6	**5**	20	10	—	60
Tombarelle Phase 3	5 AD	**37**	27	10.8	8.1	54.1	**9**	22.2	22.2	11.1	44.4
Tombarelle Phase 4	10–11 AD	**2**	—	—	—	100	**1**	—	—	—	100
Marzuolo Phase 4	11–12 AD	**5**	—	—	40	60	**2**	—	—	50	50
Case Nuove Phase 3	13 AD	**—**	—	—	—	—	**—**	—	—	—	—

1° = primary cut (includes scapula, humerus, pelvis, femur)
2° = secondary cut (includes radius, ulna, tibia, fibula)
ext. = limb extremities (includes metapodials, carpals, tarsals, phalanges)
head = cranium, mandible, all teeth

Table 13.14 Faunal remains, all sites, sheep/goat, relative frequency by skeletal part category, calculated on the basis of NISP and MNE (MM).

Sheep/Goat		NISP					MNE				
		n	1°	2°	ext.	head	n	1°	2°	ext.	head
Site	Date century										
Case Nuove Phase 1.1	1 BC	**3**	—	—	—	100	**1**	—	—	—	100
Marzuolo Phase 1	1 BC	**58**	2.5	13.8	15.5	65.5	**11**	9.1	18.2	27.3	45.5
Tombarelle Phase 1	1 BC	**7**	—	57.1	28.6	14.3	**3**	—	33.3	33.3	33.3
Pievina Phase 1	1 BC–1 AD	**6**	16.7	16.7	16.7	50	**4**	25	25	25	25
Case Nuove Phase 1.2	1 BC–1 AD	**25**	44	8	28	20	**8**	37.5	12.5	25	25
Poggio dell'Amore	1 AD	**4**	—	—	—	100	**1**	—	—	—	100
Podere Terrato	1 AD	**—**	—	—	—	—	**—**	—	—	—	—
Marzuolo Phase 2	1 AD	**43**	18.6	11.6	30.2	39.5	**11**	18.2	18.2	27.3	36.4
Tombarelle Phase 2	1 AD	**5**	—	—	—	100	**1**	—	—	—	100
Marzuolo Phase 3	2–3 AD	**44**	22.7	11.4	15.9	50	**13**	23.1	15.4	23.1	38.5
Case Nuove Phase 1.3	2–3 AD	**—**	—	—	—	—	**—**	—	—	—	—
Pievina Phase 2.1 and 2.2	4–5 AD	**115**	4.3	14.8	13	67.8	**13**	15.4	23.1	23.1	38.5
Case Nuove Phase 2	4–5 AD	**77**	5.2	19.5	9.1	66.2	**12**	16.7	25	16.7	41.7
Tombarelle Phase 3	5 AD	**16**	—	6.3	—	93.8	**4**	—	25	—	75
Tombarelle Phase 4	10–11 AD	**17**	29.4	41.2	29.4	—	**7**	28.6	42.9	28.6	—
Marzuolo Phase 4	11–12 AD	**15**	13.3	26.7	6.7	53.3	**6**	16.7	33.3	16.7	33.3
Case Nuove Phase 3	13 AD	**8**	—	37.5	25	37.5	**4**	—	50	25	25

1° = primary cut (includes scapula, humerus, pelvis, femur)
2° = secondary cut (includes radius, ulna, tibia, fibula)
ext. = limb extremities (includes metapodials, carpals, tarsals, phalanges)
head = cranium, mandible, all teeth

Table 13.15 Faunal remains, all sites, pig, relative frequency by skeletal part category, calculated on the basis of NISP and MNE (MM).

Pig		NISP					MNE				
		n	1°	2°	ext.	head	n	1°	2°	ext.	head
Site	Date century										
Case Nuove Phase 1.1	1 BC	**4**	50	—	—	50	**2**	50	—	—	50
Marzuolo Phase 1	1 BC	**148**	9.5	10	15.5	64.9	**18**	22.2	22.2	22.2	33.3
Tombarelle Phase 1	1 BC	**8**	12.5	12.5	25	50	**4**	25	25	25	25
Pievina Phase 1	1 BC–1 AD	**13**	7.7	—	7.7	84.5	**4**	25	—	25	50
Case Nuove Phase 1.2	1 BC–1 AD	**48**	31.3	6.3	25	37.5	**10**	30	20	20	30
Poggio dell'Amore	1 AD	**—**	—	—	—	—	**—**	—	—	—	—
Podere Terrato	1 AD	**—**	—	—	—	—	**—**	—	—	—	—
Marzuolo Phase 2	1 AD	**43**	23.3	11.6	41.9	23.3	**10**	20	30	20	30
Tombarelle Phase 2	1 AD	**—**	—	—	—	—	**—**	—	—	—	—
Marzuolo Phase 3	2–3 AD	**68**	11.8	10.3	36.8	41.2	**14**	21.4	21.4	21.4	35.7
Case Nuove Phase 1.3	2–3 AD	**—**	—	—	—	—	**—**	—	—	—	—
Pievina Phase 2.1 and 2.2	4–5 AD	**92**	13.8	6.3	13.8	66	**15**	20	13.3	13.3	53.3
Case Nuove Phase 2	4–5 AD	**62**	9.7	11.3	8.1	71	**11**	18.2	18.2	18.2	45.5
Tombarelle Phase 3	5 AD	**27**	—	—	—	100	**2**	—	—	—	100
Tombarelle Phase 4	10–11 AD	**6**	83.3	16.7	—	—	**3**	66.7	33.3	—	—
Marzuolo Phase 4	11–12 AD	**11**	45.5	—	36.4	18.2	**4**	50	—	25	25
Case Nuove Phase 3	13 AD	**15**	60	26.7	6.7	6.7	**6**	33.3	33.3	16.7	16.7

1° = primary cut (includes scapula, humerus, pelvis, femur)
2° = secondary cut (includes radius, ulna, tibia, fibula)
ext. = limb extremities (includes metapodials, carpals, tarsals, phalanges)
head = cranium, mandible, all teeth

Table 13.16 Faunal remains, all sites, relative frequency of UNID counts by site (MM).

Site	Date century	n	SMALL-SIZED MAMMAL				MEDIUM-SIZED MAMMAL					
			rib	long bone	vertebrae	other	rib	long bone	vertebrae	scapula/ pelvis	cranium	other
Case Nuove Phase 1.1	1 BC	**72**	—	—	—	—	9.7	30.6	11.1	4.2	1.4	—
Marzuolo Phase 1	1 BC	**754**	—	0.3	0.1	—	11.4	36.4	7.2	2.8	4.9	0.8
Tombarelle Phase 1	1 BC	**105**	—	—	—	—	7.6	25.7	2.9	1.9	1.9	4.8
Pievina Phase 1	1 BC–1 AD	**49**	—	—	—	—	4.1	49	4.1	2	4.1	—
Case Nuove Phase 1.2	1 BC–1 AD	**331**	2.4	2.1	—	—	33.8	30.5	7.9	4.5	4.2	0.3
Poggio dell'Amore	1 AD	**2**	—	—	—	—	—	100	—	—	—	—
Podere Terrato	1 AD	**10**	—	—	—	—	—	100	—	—	—	—
Marzuolo Phase 2	1 AD	**197**	0.5	—	—	—	26.4	45.7	6.6	4.6	6.1	0.5
Tombarelle Phase 2	1 AD	**3**	—	—	—	—	—	100	—	—	—	—
Marzuolo Phase 3	2–3 AD	**325**	1.5	—	—	1.2	17.5	44.6	4.3	2.2	3.4	0.6
Case Nuove Phase 1.3	2–3 AD	**9**	—	—	—	—	22.2	44.4	—	11.1	—	—
Pievina Phase 2.1 and 2.2	4–5 AD	**648**	0.8	0.1	—	—	11.3	59.1	2.2	0.8	4	1.5
Case Nuove Phase 2	4–5 AD	**321**	0.6	0.3	0.9	0.3	20.6	49.5	5.9	1.9	0.9	3.4
Tombarelle Phase 3	5 AD	**164**	—	—	—	—	—	25	1.2	1.2	—	—
Tombarelle Phase 4	10–11 AD	**31**	—	—	—	—	54.8	6.5	6.5	—	3.2	—
Marzuolo Phase 4	11–12 AD	**21**	—	—	—	—	14.3	62.9	5.7	—	11.4	—
Case Nuove Phase 3	13 AD	**9**	—	—	—	—	11.1	33.3	—	11.1	—	—

	LARGE-SIZED MAMMAL						AVIAN
	rib	long bone	vertebrae	scapula/ pelvis	cranium	other	
	18.1	18.1	1.4	2.8	1.4	1.4	—
	5.3	18.7	8.8	1.7	0.5	0.9	0.3
	17.1	18.1	3.8	7.6	5.7	0.9	—
	20.4	16.3	—	—	—	—	—
	1.2	0.3	0.3	—	—	—	12.4
	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
	1	30	1	1.5	0.5	—	2
	—	—	—	—	—	—	—
	3.4	13.5	2.8	—	3.1	1.2	0.6
	11.1	11.1	—	—	—	—	—
	1.4	14.5	1.7	0.3	2	—	0.3
	—	3.7	0.6	—	4.7	0.3	6.2
	15.9	34.1	1.8	1.2	19.5	—	—
	—	12.9	6.5	3.2	—	—	—
	—	—	—	—	5.7	—	—
	11.1	33.3	—	—	—	—	—

and Table 13.17). Whatever the reasons, this suggests that, while individual site variability is relatively high, as a group these peasant sites were producing herds resembling those in the region more generally.

The assemblage from Pievina Phase 1, seemingly the only central dwelling or "farm" among the project sites, provides one dimension of this diverse picture. This is a mixed group consisting of a small selection of cattle bones, typically from older individuals, probably a sign of keeping (or at least use of/access to), at most, a couple of cattle, presumably oxen for plowing and traction purposes. A few ovicaprids, of mixed ages, but mostly adults, imply some manner of general exploitation of meat, milk, and wool, with a focus probably on secondary products. Pigs comprise a principal source of meat, with most of these animals killed at their maximum weight, around two years of age. Overall, what emerges from Pievina is a system largely centered on "self-sufficiency" in aspects of animal production and consumption. It is a sensible, sustainable strategy; one that perhaps minimizes risks (by keeping a bit of everything), but does not venture into any type of marked, focused exploitation in taxon or product. That tactic separates Pievina from other contemporary sites, notably many of the larger elite rural villa complexes in central Italy (see Table 13.17).

By "self-sufficiency," it is not implied that agricultural peasants passively existed in isolation from the economic and cultural influence of markets and social frameworks, but rather that a predominant driver of their existence was on fulfilling their basic daily survival needs, within the fabric of seasonal scheduling. Livestock were instrumental in this lifestyle, but practicalities of expense, space, mobility, resource allocation, and access put limits on procedures for keeping and exploiting them. The Republican phase data from Pievina indicate localized raising and herding of livestock; consumption also seems to have been predominantly a local phenomenon. There is no specialization in one taxon, nor any large-scale breeding operations in place. Each is represented by parts from the entire skeleton (see Tables 13.13–13.15), suggestive of local killing and consumption. There is generally a balance among sexes within these livestock, an indication perhaps of herds that were breeding along natural lines, with no stark cultural intervention through culling of either males or females. No significant differences emerge in size and

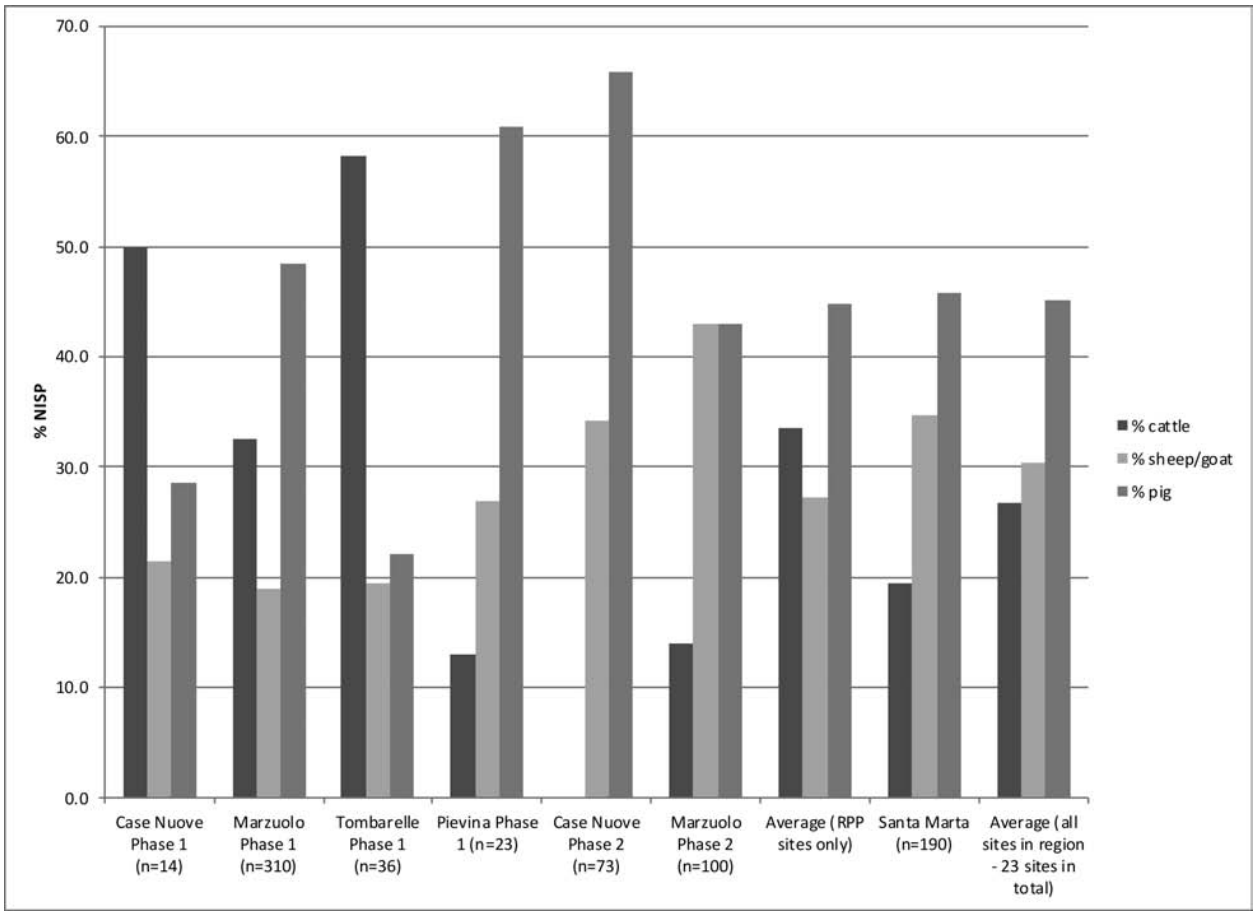


Fig. 13.17 Major domesticates for late Republican/early imperial project sites, plus Santa Marta villa and regional (central Italian, minus Rome/Ostia) average (% NISP) (MM).

shape parameters of these animals (as indicated from the zooarchaeological metric data) to denote marked access of different breeds or products as might arise from extensive import or export of stock or cuts of meat (see Table 13.16). Moreover, available demographic data register no distinct brackets among age groups to indicate significant seasonal, large-scale movement of stock. Overall, available data from the RPP materials suggest small-scale, mixed husbandry ventures. Some stock (ovicaprids in this case) may have moved as part of localized transhumant operations—sufficient pasturage presumably existed as indicated by the pollen evidence—but the bulk (including pigs and cattle) were maintained locally, or at least regionally (and year-round) as part of small farming operations. Fowling provided some supplemental resources for the diet, but hunting was minimal and likely not an activity conducted out of necessity or desperation to provide meat to the diet.

Connection with markets and community pooling/sharing of some livestock (especially ovicaprids and cattle) may help account for zooarchaeological patterns for Republican phases at Marzuolo and Case Nuove. The dumps associated with the 30–10 BC contexts at Marzuolo contained a comparatively high frequency of cattle bones (ca. 35%), alongside pigs (ca. 45%) and sheep/goat (ca. 20%). There is a general balance of skeletal parts for all these taxa, a pattern that typically indicates fairly complete carcasses were processed and consumed at the site. Age profiles for cattle register a mix of subadults and adults (both oxen and cows), but with a slight bias towards older individuals. The presence of mixed age groups might signify some resident population of cattle, perhaps tied to localized keeping of stock for traction and possibly milking. Work and plow cattle, as well as birthing cows, may have been stabled nearby to provide stock as required, and to assure new supplies

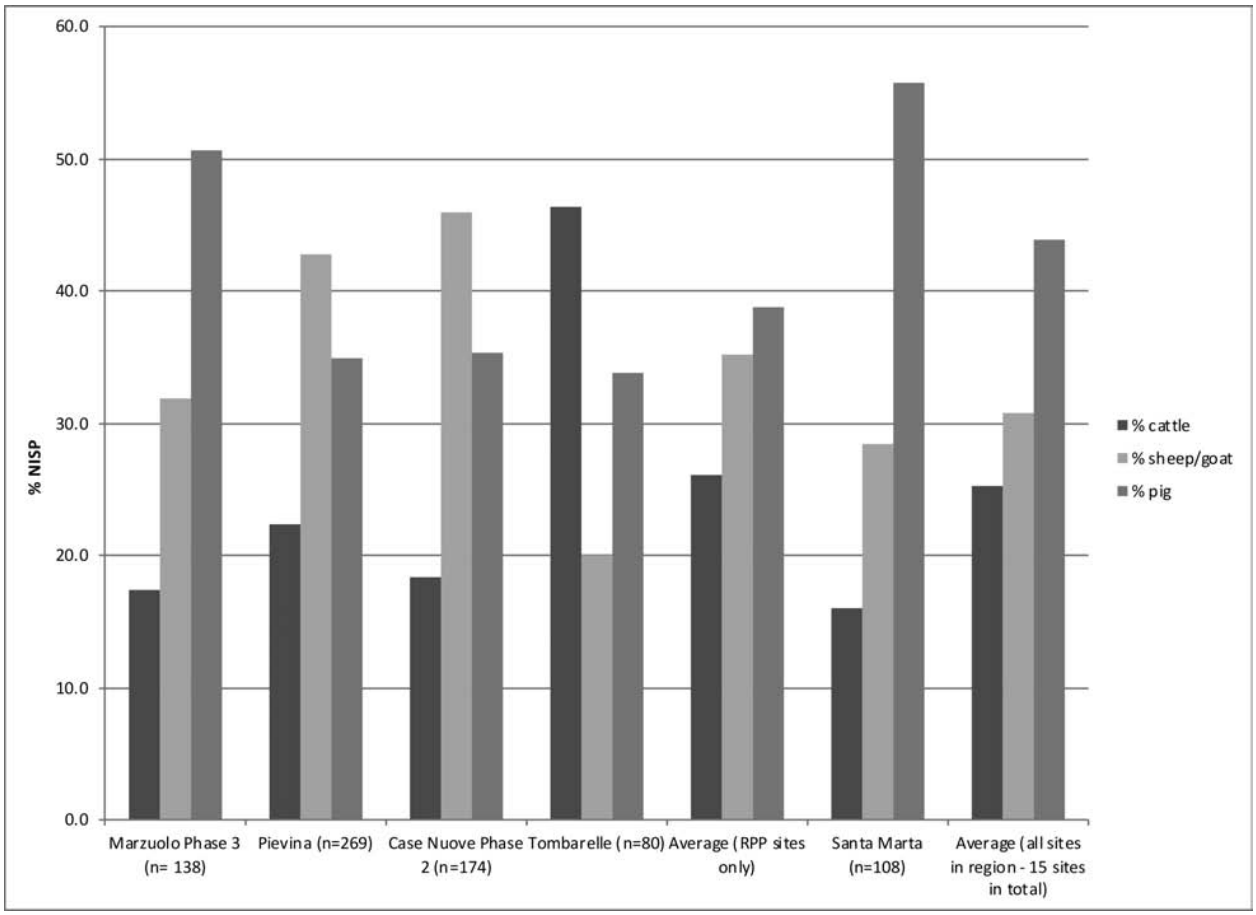


Fig. 13.18 Major domesticates for late antique project sites, plus Santa Marta villa and regional (central Italian, minus Rome/Ostia) averages. (% NISP) (MM).

through controlled birthing schemes and livestock management. Cattle were expensive animals to maintain in antiquity, and the noticeable concentration of them in this Republican-period deposit at Marzuolo might connect with the area being used to maintain a supply of oxen and cattle that could be rented, leased, or shared by farmers in the region and, when no longer of value in capacity, eventually slaughtered and consumed at the site, where a larger aggregate population (who could consume the sizeable quantities of meat yielded) existed. The nature of the materials from these Republican-phase, Area III dumps at Marzuolo presumably allies with activities around the kilns. As a center for ceramic production, it is not implausible to link a higher predominance of cattle from this assemblage to a greater probability of their engagement in transport—although, as we have observed elsewhere and discuss briefly in Chapter 17 below, the physical characteristics of this landscape seem to militate against carts as a means of transportation (cf. Grey et al. 2015). Finally, given that a single cow, ox, or bull produces a significant amount of meat, a higher proportion of cattle bones from this deposit at Marzuolo might further imply a larger (even if short-term assembled) population to feed.

Evidence for husbandry patterns change in the second phase of the Marzuolo site, after it shifts to seemingly larger scale, specialized production of Italic sigillata. The predominance of pigs, sheep/goat, and domestic fowl among assemblages for this period denote common fare, and presumably some measure to enhance these components within the diets of occupants at this time. Age patterns among sheep/goat and pig, in particular, display more variability than their earlier correlates, but skew towards younger demographics, a testament perhaps to augmented efforts to expand husbandry efforts where these taxa are concerned to cater to broader

Table 13.17 Faunal material, NISP values for sites in Tuscany and central Italy arranged by temporal phases (from late Republic to late antiquity). Rome and Ostia are excluded. Project sites in bold (MM).

Site	Site Type	Date century	NISP Total[a]	% Cattle	% Sheep/ Goat	% Pig	NISP other[b]	Reference
REPUBLICAN PHASE SITES								
Cosa (houses)	urban settlement	2 BC	111	5.4	55.9	38.7	1 equid	Scali 1993
Bolsena	settlement	2 BC–1 AD	1093	12.3	50	37.7	1 equid, 1 dog, 15 hare, 35 domestic fowl, 13 other avian	Tagliacozzo 1995
San Martino	**animal stable?**	**2 BC–1 AD**	**2**	**50**	**—**	**50**	**—**	
Case Nuove Phase 1.1	**pressing station**	**1 BC**	**14**	**50**	**21.4**	**28.6**	**1 red deer, 1 roe deer, 14 domestic fowl**	
Marzuolo Phase 1	**settlement**	**1 BC**	**310**	**32.6**	**19**	**48.4**	**12 domestic fowl, 4 red deer, 3 wild boar, 1 other bird**	
Tombarelle Phase 1	**settlement?**	**1 BC**	**36**	**58.3**	**19.4**	**22.2**	**1 dog, 17 red deer, 4 wild boar**	
Pievina Phase 1	**'peasant' farm**	**1 BC–1 AD**	**23**	**13**	**26.9**	**60.9**	**1 dog, 1 red deer, 1 hare, 1 domestic fowl**	
Case Nuove Phase 1.2	**pressing station?**	**1 BC–1 AD**	**73**	**—**	**34.2**	**65.8**	**35 domestic fowl, 3 song thrush, 3 galliformes**	
IMPERIAL PHASE SITES								
Poggio dell'Amore	**animal stable?**	**1 AD**	**4**	**—**	**100**	**—**	**—**	
Podere Terrato	**'peasant' house/yard**	**1 AD**	**—**	**—**	**—**	**—**	**3 equid**	
Marzuolo Phase 2	**settlement**	**1 AD**	**100**	**14**	**43**	**43**	**4 dog, 10 domestic fowl, 6 red deer, 1 hare, 5 other avian**	
Tombarelle Phase 2	**settlement?**	**1 AD**	**7**	**28.6**	**71.4**	**—**	**—**	
Santa Marta	villa/ settlement	1 AD	190	19.5	34.7	45.8	1 dog, 1 equid, 12 domestic fowl, 15 red deer, 2 roe deer, 6 wild boar	
Monte Gelato	rural villa	1–2 AD	294	6.8	21.8	71.4	1 equid, 3 dog burials, 1 red deer, 28 domestic fowl, 27 other avian	King 1997
Le Colonne	rural villa	1–2 AD	508	22.6	28.7	48.6	13 equid, 1 dog, 21 red deer, 3 fallow deer, 1 hare	King, n.d.
Vacanas (Valle di Baccano)	mansio	1–2 AD	117	41.9	44.4	13.7	None reported	Cerilli 2005
Pantani-Le Gore	mansio	1–2 AD	99	90.9	4	5.1	—	Boscato & Mascione 2007/08
Tenuta di Vallerano (near Rome)	rural	1–2 AD	231	50.2	35.9	13.9	174 horse, 49 dog, 4 red deer, 5 hare, 7 domestic fowl	Minniti 2005
Villa dei Quintili	suburban villa	1–2 AD	132	—	13.6	86.4	None reported	De Grossi Mazzorin 1987
Chianciano Terme	settlement/ spa	1–3 AD	25	16	32	52	1 boar, 2 domestic fowl	MacKinnon 2009

[a]cattle+sheep/goat+pig [b]other principal mammalian and avian taxa

Table 13.17 cont'd Faunal material, NISP values for sites in Tuscany and central Italy arranged by temporal phases (from late Republic to late antiquity). Rome and Ostia are excluded. Project sites in bold (MM).

Site	Site Type	Date century	NISP Total[a]	% Cattle	% Sheep/ Goat	% Pig	NISP other[b]	Reference
Il Monte – San Gimignano	settlement	1–3 AD	442	28.3	32.6	39.1	29 equid, 4 dog, 2 domestic fowl, 4 red deer, 2 hare, 2 roe deer, 2 other avian	Prilloff 2013
Settefinestre	rural villa	1–3 AD	2234	10.8	16.6	72.6	11 equid, 24 dog, 9 cat, 164 red deer, 5 roe deer, 3 fallow deer, 72 hare, 121 domestic fowl, 214 other avian.	King 1985
Lugnano	rural villa	1–3 AD	21	14.3	23.8	61.9	1 equid, 18 red deer, 1 roe deer, 4 domestic fowl	MacKinnon 1999
Pistoia	urban settlement	1–3 AD	17	35.3	17.6	47.1	None reported	Giorgetti and Campodoni 1985
Ossaia	rural villa	1–4 AD	1722	16.2	21	62.8	15 equid, 9 dog, 1 cat, 29 red deer, 18 roe deer, 1 fallow deer, 32 boar, 123 hare, 112 domestic fowl, 18 other avian	Bokonyi, n.d.
Filattiera (near Luni)	settlement	1–3 AD	65	12.3	33.8	53.8	None reported	Giovinazzo 1998
Marzuolo Phase 3	**settlement**	**2–3 AD**	**138**	**17.4**	**31.9**	**50.7**	**5 equid, 5 dog, 13 domestic fowl, 2 red deer, 2 hare, 5 other avian**	
Case Nuove Phase 1.3	**pressing station?**	**2–3 AD**	**5**	**—**	**20**	**80**	**14 domestic fowl, 1 red deer**	
Vacanas (Valle di Baccano)	mansio	2–4 AD	19	10.5	68.4	21.1	None reported	Cerilli 2005
LATE ANTIQUE PHASE SITES								
Pievina Phase 2.1 and 2.2	**'peasant' house**	**4–5 AD**	**269**	**22.3**	**42.8**	**34.9**	**4 equid, 6 wild boar, 2 red deer, 1 roe deer, 2 badger, 2 domestic fowl, 5 tortoise**	
Case Nuove Phase 2	**threshing site?**	**4–5 AD**	**174**	**18.3**	**45.9**	**35.3**	**13 red deer, 8 dog, 20 domestic fowl**	
San Mario	rural/farm	4–5 AD	332	24.7	46.4	28.9	1 dog, 1 horse, 1 red deer, 1 hare, 6 domestic fowl	Motta, Camin &Terrenato 1993
Chianciano Terme	watering hole	4–5 AD	178	44.4	29.8	25.8	5 equid, 2 dog, 2 cat, 2 boar, 1 fallow deer, 4 domestic fowl	MacKinnon 2009
Settefinestre	rural villa	4 AD	751	16.8	30.2	53	16 equid, 25 dog, 76 red deer, 6 fallow deer, 6 hare, 13 domestic fowl, 7 other avian	King 1985
Monte Gelato	rural villa	4–5 AD	344	7.8	51.2	41	1 equid, 5 dog, 1 roe deer, 2 fallow deer, 23 domestic fowl, 4 other avian	King 1997
Fiesole	settlement	4–5 AD	341	17	7	76	126 domestic fowl, 5 red deer, 12 hare, 7 other avian	Corridi 1990
Filattiera (near Luni)	settlement	4–6 AD	95	4.2	47.4	47.4	1 equid	Giovinazzo 1998
Pantani-Le Gore	mansio/ settlement	4–6 AD	963	90	4.3	5.8	5 equid, 1 dog, 2 red deer	Boscato & Mascione 2007–8

[a]cattle+sheep/goat+pig [b]other principal mammalian and avian taxa

Table 13.17 cont'd Faunal material, NISP values for sites in Tuscany and central Italy arranged by temporal phases (from late Republic to late antiquity). Rome and Ostia are excluded. Project sites in bold (MM).

Site	Site Type	Date century	NISP Total[a]	% Cattle	% Sheep/ Goat	% Pig	NISP other[b]	Reference
Pistoia	urban settlement	4–7 AD	87	26.4	26.4	47.2	1 equid, 1 red deer	Giorgetti & Campodoni 1985
Tombarelle Phase 3	**settlement?**	**5 AD**	**80**	**46.3**	**20**	**33.8**	**3 equid, 4 dog, 2 domestic fowl, 1 wild boar**	
Lugnano	rural villa	5 AD	27	11.1	22.2	66.7	3 equid, 7 dog, 1 hare, 17 domestic fowl	MacKinnon 1999
Santa Marta	rural villa/ bath	5–6 AD	67	14.9	29.9	55.2	3 dog, 9 domestic fowl, 2 red deer, 1 hare, 1 wild boar	
Santa Marta	rural villa/ bath	6–7 AD	41	17.1	26.8	56.1	1 dog, 4 equid, 10 domestic fowl	
MEDIEVAL PHASE SITES (not discussed in current chapter – refer to individual site reports for details)								
Santa Marta	rural villa/ settlement	7 AD and later	72	13.9	37.5	48.6	6 equid, 5 domestic fowl, 1 red deer	
Tombarelle Phase 4	**settlement?**	**10–11 AD**	**25**	**8**	**68**	**24**	**1 equid, 2 dog, 1 domestic fowl, 1 red deer**	
Marzuolo Phase 4	**settlement**	**11–12 AD**	**31**	**16.1**	**48.4**	**35.5**	**1 equid, 8 dog, 4 red deer, 1 hare**	
Santa Marta	**rural villa/ settlement**	**11–12 AD**	**15**	**—**	**60**	**40**	**2 red deer, 1 roe deer**	
Case Nuove Phase 3	**threshing site?**	**13 AD**	**20**	**—**	**40**	**60**	**213+ dog (MNI=4), 1 domestic fowl, 69+ hare, 1 red deer, 1 roe deer**	

[a]cattle+sheep/goat+pig [b]other principal mammalian and avian taxa

demands for consumable products. Even though a large-scale production facility for Italic sigillata, its assemblage is generally in line with trends exhibited across the wider Etruria/west central region of Italy, most notably those sites classified as "settlement" or "village" complexes, such as the villa of Santa Marta inside the locale, Chianciano Terme, and Filattiera (Fig. 13.17 and Table 13.17). Customarily, as shown in Table 13.17, these "settlement" sites register about 50% pig (by NISP frequency), 35–40% sheep/goat and 10–15% cattle, with a small complement of other taxa. The predominance of pigs among these sites has typically been linked to an overall Roman penchant for pork, although this trend is in large part a central Italian, rather than pan-Italian phenomenon (King 1999; MacKinnon 2004). High frequencies of pigs are represented among many suburban and urban contexts, in and around Rome (e.g., Villa dei Quintili, as well as assemblages in Rome and Ostia). Relatively wealthier rural sites, such as the rural villas at Settefinestre, Ossaia, Le Colonne, Monte Gelato, and Lugnano, also register very high zooarchaeological values for pig (in some cases exceeding 60–70%). Rural villa sites often incorporate a range of wild animals, further solidifying the elite nature of meat diets here. In many cases, younger animals predominate among these wealthier sites as well. These include both sites specializing in animal products (among other ventures) and consumer sites feeding upon higher status foodstuffs. Marzuolo fits into this network predominantly as a consumer site in need of provisions, even if its demands were largely seasonal in nature. Overall, the site registers a fairly diversified assemblage of animals, but with a relatively higher frequency of juvenile and subadult stock than among earlier phases. Localized husbandry schemes to cull animals of mixed ages to meet these seasonal dietary requirements, with some attention to provisioning of better-quality meats for that audience, may explain this pattern.

Marzuolo also illustrates the way in which a seasonal artisanal settlement could, in theory, be associated with peasant supply chains. Production facilities and "settlements" are ready markets to which smaller-scale local producers can cater. Piecemeal supply to these networks by peasant farms with small herds might ensure an extra dimension for peasant livelihood. Certainly, any single peasant household could not compete in this regard in the way a large-scale specialized farm villa might, but aggregate peasant networks might be a means with which to supply smaller settlements.

If Marzuolo reveals the intersection of artisanal production and goods transport with local peasant husbandry, the abandonment of the press complex at Case Nuove may demonstrate relationships with local elites, or the possibility that dining practices among some peasants, at least, were more sophisticated and diverse than previous scholarship has been willing to countenance. The Case Nuove assemblage skews towards an assemblage richer in younger pigs, ovicaprids, and domestic fowl, with no cattle bones identified. Evidence here suggests a wealthier or privileged diet, where younger animals, particularly choice domestic meat animals such as lamb, kid, piglet, and domestic fowl, as well as a larger proportion of better-quality primary meat cuts from these animals, formed a central component of the diet.

It is difficult to determine the exact nature of the Case Nuove deposit, although it appears to relate to the abandonment of the communal pressing complex used, seemingly, by neighboring families to process grape and olive harvests. While it is possible the faunal waste retrieved here links with elite diets from the nearby large farm/villa at Santa Marta (and may have no bearing on peasant life per se), it is not unimaginable that seasonal congregations of workers frequenting the site used the opportunity to feast (on better-quality meats) and reinforce social and economic bonds in the process—in a manner comparable, for example, to dining and feasting practices associated with reaping and harvesting (cf. Shaw 2013). Drawing together any pooled ovicaprid flocks at this time might also have allowed herders to cull portions of the entire assembled flock, a practice that might be more effective for herd vitality. Herds of pigs might similarly have been managed, but it is also possible that local supplies of younger pigs, ovicaprids, and domestic fowl were provided for seasonal workers using this pressing station. Pressing operations might even have been timed to coincide with a seasonal availability of younger animals, perhaps late summer/early fall. That is, a seemingly "elite" dietary assemblage, as this Case Nuove Republican phase collection may imply on the basis of its "better quality" meats, may be interpretable not as an unexpected departure from assumed patterns of peasant frugality and self-sufficiency, but rather as an expression of a moment in peasant social bonding and collective herd management. If, in pooling resources at this time, decisions were made to slaughter more young animals for the betterment of the herd overall, this is a choice herders formulated with long-standing goals, and not something in line with dietary ostentation or display of excessive wealth. Moreover, any seasonal operation at Case Nuove could take advantage of seasonal scheduling in animal husbandry patterns, providing an efficient means of coordinate ventures.

As noted above, sites on the short-term end of the habitation spectrum, as well as Podere Terrato, yielded virtually no faunal materials. San Martino is a case in point: identified as a small-scale stabling point, it was too small to house large herds, but could have held small herds, feeble, and ill animals. This was a fairly clean area, aside from stray fecal waste and associated parasites from such waste. Domestic food trash, including butchered bone waste, was not dumped in the structure, or if it was, such rubbish was removed while the structure was in operation. Isolated deciduous teeth of ovicaprids and cattle do not surface in any significant numbers to suggest that the structure maintained newborn lambs, kids, or calves for any considerable time. Then again, it is possible that shed milk teeth from these younger animals were swept away and removed in diligent cleaning operations in the structure. Whatever the case, it is important to emphasize that an overall dearth of zooarchaeological remains at San Martino need not discount any wider (or even principal) function of the site in sheltering animals. One might expect minimal food and processing rubbish to collect at the site overall if it was only frequented seasonally.

The second site of interest is Poggio dell'Amore. Despite poor preservation, some hypotheses can be made regarding the function of this site, particularly in comparison to San Martino, with which it shares a locale, its small size and many other components. Like San Martino, Poggio dell'Amore yielded tiny

quantities of artifacts and faunal remains. Similarly, no definitive installations for cooking or storage were found, although the presence of microcharcoals of variable sizes does indicate fires, as do the cooking pots. And again, the near absence of faunal materials, limited to four isolated teeth (from sheep/goat) and two small limb bone fragments (from mid-sized taxa) suggest very little food waste accumulated on the site. Although the raw numbers of such finds were probably reduced by the site's poor preservation, the general parallels with San Martino point to a similar periodic rather than constant use. Likewise, common to both is the presence of coprophilous fungi that are indicators of dung. Although the overall quantities are lower at Poggio dell'Amore, again it seems likely that this small structure periodically housed animals.

The final site to note is Podere Terrato. Although heavily damaged by erosion, the site yielded structural features coincident with a small "house" and a neighboring "garden" and "yard." The only faunal remains recovered were three equid tooth fragments. Their presence might indicate keeping of equids (whether horse, donkey, or mule could not be determined from the fragments) in the area at some point. Teeth can chip, break, or fall out and become incorporated into the yard.

Collectively what might the sites of San Martino, Poggio dell'Amore, and Podere Terrato tell us about animal husbandry in the project area? It is important to be cautious in extrapolating too much from the zooarchaeological data in these cases. While occasional stabling of animals may have occurred, excavated contexts (both inside and outside these structures) were predominantly devoid of faunal waste. Consequently, arguments must largely center on negative evidence. This relative lack of zooarchaeological materials in these cases cannot be attributed solely to taphonomic conditions, but also cultural factors. One might expect such an absence if occupants maintained cleaner surfaces and floors. If these structures held some sort of mixed-used function, such as co-habitation (even if temporary) between humans and animals, it appears that waste was discarded in an efficient manner, keeping living and working surfaces clear.

Nevertheless, the mere presence of animal stables and yards in the rural landscape, notably ones whose imprint is relatively small, reinforces an importance of livestock management across a wide scale—large and small. Moreover, in the case of Podere Terrato, specifically, it reminds us of the value of pack animals to the rural economy, especially in this landscape. Although horses might typically have been the purview of the elite, donkeys and mules had a broader presence and were important in peasant life. In this context we may recall, for example, that Halstead's (2014:289) list of minimum essentials for a small-scale farmer included a donkey. The importance of pack animals as a means to augment peasant mobility should not be downplayed, even if the physical faunal traces of equids among sites are rare. Moreover, it is worth noting that among several of the sites in Table 13.17 where equids register in large numbers (e.g., Tenuta di Vallerano, Pantani-Le Gore, Le Colonne, Il Monte-San Gimignano, Ossaia), cattle are also relatively plentiful. This connection may highlight the role these taxa collectively fulfilled as traction and pack animals.

Shifting to the late antique period, the project sites show husbandry patterns consistent with those found across late antique Italy, namely a stronger presence of ovicaprid husbandry accompanied by a decline in pork demand and a shift towards decentralized, smaller pastoral operations (see Fig. 13.18 and Table 13.17). There are some exceptions to this trend, and elite sites, including rural villas like Settefinestre, Santa Marta, and Lugnano, which often continue to support larger pig populations, were capitalizing upon still somewhat strong urban demands for pork. Systems of animal production and consumption adapt to these factors often through localized schemes of reorganization. Nonetheless, even though some general faunal trends overlay the bulk of sites in late antiquity, variability still registers dependent on the size, nature, and function of individual sites (and their deposits).

Pievina Phase 2 exhibits this pattern and provides perhaps our best example of "peasant" husbandry activities in late antiquity. Generally, the assemblage here is marked by a slight predominance of ovicaprids (ca. 45%), followed by pigs (ca. 35%) and cattle (ca. 20%). The age structure of these taxa remains largely the same as exhibited for Republican levels from the site: essentially older cattle (for traction), older ovicaprids (for wool, hair, and milk), and subadult pigs killed at their maximum weight. Sheep outnumber goats (stressing the value of wool), and a balanced ratio between male and female pigs suggests

a more natural herd demographic. Although frequency values for the individual taxa—cattle, sheep/goat, and pig—are different between Republican and late antique samples for Pievina, the demographic composition of those taxa is consistent. In other words, these peasants still seem focused upon mixed husbandry regimes, only this time with slightly more ovicaprids and perhaps fewer pigs.

The picture from Case Nuove Phase 2 presents a broadly similar situation, with some variation again consistent with the earlier phases of the site. Overall, while the frequency values of cattle, sheep/goat, and pig are practically identical to those from the late antique deposits from Pievina (ca. 45% sheep/goat, ca. 35% pig, ca. 20% cattle), younger animals are more common. The situation here is quite similar to that for the Republican-period assemblages from these two respective sites, and may denote "lesser-quality, tougher meat cuts" at Pievina (arguably "poorer" type foodstuffs), but dining on "better-quality" meats in the case of Case Nuove. Whether the latter occurred as a component of communal gathering to use the pressing equipment at Case Nuove (as argued for the earlier cases at this site) or represents a different level of dietary wealth (for "peasant" or otherwise) is difficult to determine. The nearby Santa Marta site, possibly reduced in this period to a large bath complex (see Ch. 2), may have hosted a wealthier population, permanent and/or traveling, who may have frequented the site. Alternatively, the younger age profile may simply register the variation of peasant husbandry strategies within the project area.

In sum, the project has revealed both the variability and consistency of peasant husbandry patterns and their adhesion to broader patterns in central Italy. Nonetheless, it is important to situate that conclusion within the wider fabric of issues that can affect available data. While consistency can indicate temporal and situational endurance, variability can be due to functional differences among sites. This certainly applies in the case of the project dataset, where a range of site types, and activities within them, surfaced. Comparing materials that derived from a farm, a pressing station, a seasonal artisanal production facility, a stable, among other types of sites, brings a level of inherent flexibility, not to mention further levels of diversity that can ensue among deposit types within such sites (e.g., comparing a midden from a farm, with a leveling fill from a seasonal camp, for example). Nonetheless, this spectrum of consistency and variability, well displayed in the data and its ensuing patterns, itself reinforces cultural and behavioral flexibility. In other words, any fixed generalized template to impart upon "peasant" life across Roman antiquity for this area of Italy does not work neatly.

Overall, work from the RPP describes populations who had access to work animals, such as cattle and equids, and seemed to have taken care to clear yards and surfaces (and deal with trash), probably maximizing rubbish and manure resources in crop fertilization. They managed some livestock, and may even have produced surpluses within these, which could be sold, traded, or consumed as required. They appear to have taken good care of these animals; none exhibits any marked osteological traces of disease, malnutrition, or other pathological condition.

Most importantly, the metrics on species types, size, and, to a lesser extent, age correlate broadly with those from central Italy as a whole and from elite sites generally with some notable exceptions. As noted above, general ratios of major species fall within regional normative practices and reflect the long-term changes in those practices into late antiquity. The age structure of these taxa remains relatively consistent across time and space. Available metric data display a range of sizes, but nothing significantly skewed to denote peasants were denied quality stock or had to contend with the "runts of the litter." Rather, they seem to have raised the same varieties and breeds of livestock that all other manner of contemporary farms (large and small) were provided. The exception is hunted game animals, even ones that might have been caught or trapped quite easily (e.g., wild hare), which seem not to have formed part of peasant husbandry strategies, perhaps a reflection that sufficient meat from domesticates could be acquired as desired.

Access to markets was essential for many peasant farmers; they did not work and live in isolation. While consumption of goods among peasants was probably largely horizontal in nature (i.e., peasant to peasant), presumably this did not stop them from selling goods (and services?) at markets when amenable. Zooarchaeological evidence from the project helps reinforce this aspect, perhaps best in the case of Pievina. Here, patterns show no particular strategy to capitalize on profit through production of surplus

livestock or concentration on one taxon, but Pievina was content otherwise, and its system of mixed husbandry successful and adaptive in its own right, and along its own terms.

13.9 Conclusions: An "Extensive-Intensive" Agricultural System (KB)

Many earlier studies on ancient peasant agriculture assumed that they practiced what is termed "extensive" agriculture, contrasting this practice with its assumed opposite, "intensive" agriculture. Indeed, these terms are widely used as descriptors of agricultural practice in assessments of Roman agricultural productivity and, crucially, as markers of its changing history. Broadly speaking, "extensive" agricultural practices are equated with low-investment/capital/labor techniques that use more land at less productivity. Strategies that emphasized pasture and animal husbandry, cereals, alternate fallowing without the insertion of nitrogenous crops are all cited as examples of "extensive" agriculture. By contrast, "intensive" practices are usually associated with the tree crops of viti- and oleoculture or gardens, which entail high labor/investment but also give higher yields per unit area.

Archaeologists and historians have long been tempted to parse Roman rural history around an intensive/extensive binary. Inland areas have been assumed to be characterized by practices of extensive production focused on pastoralism. A typical division is between an intensive, viticulture dominated system operated by the slave-owning elite, and "peasant" practices which, it is assumed, lacked either the techniques or access to markets to participate. Others assume that intensive techniques were adopted near Rome, the further from which one traveled or the more "liminal" the location, the more likely extensive techniques were to dominate (Morley 1996; Kron 2012a:156–158; Ligt 2012). An "intensive/extensive" transition likewise forms the punctuation marks of Roman agrarian and social history characteristically interpreted as the abandonment of wine production in the supposed slave villas of the central coast in favor of grain production and tenancy during the empire (Rostovtzeff 1926; Carandini 1985a, 1989; Vera 1992; Patterson 2006:66–88).

More recent work has tended to argue for intensive practices and important improvements in crop and stock productivity at most if not every level of society. The recent arguments about breed improvements and size increases have emphasized the degree to which animal agriculture might involve many characteristics of "intensive" practices such as large labor investments and micromanagement of pasture and pasture grasses (Kron 2004, 2005b). A reconsideration of presumed labor practices has suggested that under conditions of expanded market access, increased urbanization and potentially greater demographic pressure, peasant and tenants alike will intensify their labor practices with an eye towards greater productivity—larger yields, cash crops (Erdkamp 2015). And new data have allowed archaeologists to look beyond macroscale models, finding evidence for intensive agricultural practices—manuring, terracing, drainage—at both large and small scales (Haas 2011, 2012; Quilici and Quilici Gigli 2009).

The data from this project strongly supports these more recently scholarly trends, finding that smallholders in the project area during the late 2nd c. BC to the first half of the 1st c. AD utilized intensive agricultural practices. Our data contributes to the extensive/intensive question, by complicating the duality of these terms and placing peasants at the center of the problem. As we have noted above, the possible use of convertible agriculture and the rotation of crops either between fields or within fields to maintain and even boost soil fertility is one of the most important markers of intensive practice (Bowes et al. 2017). The common field drains, found at Pievina, Colle Massari Romano, Podere Terrato, and in the later phases of Marzuolo, are another marker that indicate an intensive investment in draining waterlogged spaces, spaces which the pollen records indicate may have been used as pasture. "Intensive" practice is here applied to "extensive" products i.e., cereals, pasture, and stock rearing.

Finally, the data from the sites themselves point to this late 2nd c. BC to 1st c. AD as a moment of intensive and specialized use of the land. As noted above, the spectrum of habitation sees the construction of temporary or seasonal spaces for particular functions—stabling, pressing, industry—out in the landscape where cultivation took place. The botanical evidence finds that surrounding land to be itself specialized around those sites—grain production

near more permanent spaces and more grazed pasture near those less intensively occupied. This moment finds the cultivators literally building their investment in the land into structures that facilitated their use of it. Ikeguchi (2006) argued some time ago that the presence of presumed "outbuildings" found in field surveys (cf. San Martino and Poggio dell'Amore) could be read as indicators of "intensiveness of practice." He had assumed such outbuildings would be built by villa owners as the only persons with the resources for such activities, and that only viticulture and oleoculture would require them. Our data suggests the practice to be independent of both villa-owning elites and viticulture and part of broad-based, peasant-dominated *habitus*.

At the same time, it is important to see this data as a corrective to the notion of "intensive" regimes. Too often these terms have been defined by a crop, rather than a practice: vines and wine production are "intensive," while cereals and pasture are "extensive." The data from this project has found instead strong evidence for intensive practice—that is to say, major investment in the maximum productivity of the land—but around products normally discounted from those practices. Cereals are often classed as part of an "extensive" agricultural mode, as though the species, rather than its cultivation, were sufficient to assess investment. The possible insertion of pasture in the rotation cycle likewise finds pastoral systems integrated into an intensive regime, an addition particularly suited to the geomorphology and hydrology of this area with its heavy, hard-to-plow clays and abundant springs. This is in agreement with the geomorphology and hydrology of this territory. Finally, it has often been assumed that while elite villas may have engaged in intensive production, this activity was limited not only to a crop, but to a class, i.e., the elite. Here, we find most emphatically a local peasantry far from the control of even the locale's single villa, engaged in intensive practices around cereals and pasture, solidifying their investment with structures on the land itself.

Finally, a recognition of the complexity of practices adopted by this rural peasant majority, the important admixture of animals and pasture, and the adaptation of rotation regimes all suggest that yields calculation are probably impossible to calculate. As noted in the introduction to this chapter, yield calculations have always relied on a chain of assumptions, many of which have been thrown into doubt by the results outlined above, particularly the amount of land under cereal cultivation at any given time, and the extent to which wheat production offers an accurate proxy for the average Roman caloric budget. We have made no attempt to calculate yields from the locale's lands: in ***not*** doing so, we hope to emphasize both the problems with former assumptions and the importance of systematic study in place of assumptions. Indeed, we would argue that, given the complexity of Roman peasant agriculture, there is a long way to go before such data can be usefully quantified.

NOTES:

13.1 cf. Roman Britain, where two studies relying on big botanical datasets are transforming our knowledge of agricultural practice in that province (Rippon, Smart, and Pears 2015; Smith et al. 2016); and Roman Gaul, where massive datasets on plant landscapes have likewise revealed a highly intensive, regionally differentiated agrarian regime (Matterne 2003; Zech-Matterne, Wiethold, and Pradat 2014).

13.2 Additionally, similar maps have been made for the archaeological areas in Italy of Castel di Pietra (GR), Miranduolo (SI), S 'Urachi (OR), Selvena (GR), and Sassoforte (GR), with publications in preparation.

13.3 See http://www.fao.org/docrep/X5310E/x5310e04.htm.

13.4 See De Grossi Mazzorin and Minniti (2017) for a zooarchaeological synthesis of ancient Rome; for Ostia, refer to MacKinnon (2014).

13.5 A testament, perhaps, to peasant cleanliness and spatial organization.

14

Diet, Dining, and Subsistence

Kim Bowes, Michael MacKinnon, Anna Maria Mercuri, Eleonora Rattighieri, Rosella Rinaldi, and Emanuele Vaccaro

The question of peasant diet, and Roman diet more generally, has seen more comprehensive study than many other aspects of peasant life, with a considerable body of work by both historians and archaeologists. Hand in hand with the question of diet has been the allied question of subsistence, its definition, and applicability to Roman smallholders. The project sought to contribute to this debate by gathering a systematic dataset on foodstuffs, dining, storage and, in conjunction with the data on agricultural practice, on agricultural capacity and risk strategies. The conclusions presented here do not pretend to resolve these debates: they do, however, present integrated findings on food production, consumption and storage and integrate the question of diet into the broader question of peasants' relationships with food.

As with many other aspects of this project, this integrated approach owes much to the work of Peter Garnsey, who first approached the question of peasant diet as a matrix of socioclimatic relationships. Relying on Shanin's (1980) definition of peasants as smallholders in quasi-autarkic production limited to their own family needs and on estimates of the size of peasant landholdings from colonial plots, Garnsey (1988) argued that Roman peasants might only with difficulty produce enough for their own needs. Assuming a diet composed largely of grain and vegetables (Foxhall and Forbes 1982), he further argued that peasant diets were meat- and, thus, protein-poor, an argument that has been sustained by some isotopic studies on Roman-period skeletons (Craig et al. 2009; Kilgrove and Tykot 2013) and continues to be sustained by some historians (Harris 2011; Towaide and Brown 2013; Chanzedon 2015). This protein deficit, combined with the periodic cycles of drought that characterizes Mediterranean climate and the resultant cycles of want, left peasants particularly vulnerable to chronic malnutrition. Contact with the market, Garnsey assumed, was deliberately avoided as the risks it presented outweighed the potential advantages of cash exchange.

This somewhat pessimistic view of peasant diet, and its assumptions about subsistence have been more recently challenged. Cereals, it is now clear, did not overwhelmingly dominate the diet of non-elite populations, as archaeobotanical evidence reveals important evidence for other foods, particularly legumes with their important protein content, meat, and a variety of vegetables and fruits (Davies 1971; Kron 2012a; Rowan 2016; Heinrich and Erdkamp 2017; Heinrich 2019). Agglomerated studies on faunal materials point to a significant increase in meat consumption on urban and rural sites in Italy from the mid-late Republic onwards (King 1999; MacKinnon 2004), while isotopic studies on some urban coastal populations point to an important admixture of fish protein in the diet (Prowse et al. 2004; Rutgers et al. 2009). The caloric contribution of wine and olive oil,

seemingly consumed by all Romans in large quantities, is now thought to have been important nutritionally (Jongman 2007), while the few published botanical studies from Italy, mostly on urban populations, point to much wider variety of foods, including a variety of protein-rich plants, than previously supposed (Ciardi 2007; Robinson and Rowan 2015; Rowan 2016, 2017; Kron 2019) The data for Roman diets in the northern provinces is even more striking, with the advent of Roman rule bringing a notable increase in dietary diversity to both urban and, with some delay and moderation, rural populations in Britain, Gaul, and the central European provinces (Bakels and Jacomet 2003; Mattérne 2003; Veen 2007, 2008).

The limited data from human skeletal remains have been used to in support of both the optimists and the pessimists. Despite its attendant problems, stature has come to be widely used as an indicator for nutritional status (Formicola 1993; Floud et al. 2011). Two major studies on exclusively Italian populations from 500 BC to 500 AD came to opposite conclusions, one finding that mean stature over the whole period was high relative to early modern populations (ca. 168.3 m for males) (Kron 2005a), while another, more chronologically specific study, found Roman mean stature to be considerably lower (164.4 m) than both the Iron Age and medieval populations before and after (Köpke and Baten 2005; Giannecchini and Moggi-Cecchi 2008). Isotope data has yielded similarly complex results (Prowse et al. 2004; Craig et al. 2009; Kilgrove and Tykot 2013; Martyn et al. 2018), showing significant differences in dietary isotopes between genders, ages, even from populations in similar locations and status. Moreover, outstanding questions on the pathways by which carbon and nitrogen isotopes are incorporated into bone collagen have recently called into question the utility and comparability of these results for dietary reconstructions (Craig et al. 2013). Similarly, recent reassessments of porotic hyperostosis and its causes have pointed to a variety of causes for these cranial lesions, not just anemia as previously thought (Walker et al. 2009).

Both sides of these debates share a reliance on limited, scattered datasets with problematic comparability, as well as a tendency to start from a set of "facts"—crop yields, size of holdings, climatic conditions, mortality rates—which typically derive from lacunose datasets, Mediterranean climate generalities, or modern populations. Thus, opposing arguments frequently adduce the same evidence, while thin, problematic data has been made to support more weighty results than it can bear.

The data gathered by the project is more limited than that used by previous assessments. The principal datasets come from macroremain collections of seeds and fruits, attesting to the plant materials consumed on-site; the faunal collections, attesting to animal consumption, butchery techniques, and animal husbandry patterns; and physical evidence for storage. All collections were highly limited in many sites: macroremain counts ranged from 0 to 635 but averaged only 133, with three sites/phases yielding 0, while faunal remains were also sporadic and averaged only 77 NISP for cattle, sheep/goat, and pig across all sites. Only one granary and two cisterns were found, and the rest of the dataset for storage comes from finds of dolia.

The scarcity of preserved plant macroremains and faunal remains deserves some comment. While all stratigraphically significant contexts were wet-sieved, as well as a series of other contexts for control, very few yielded really robust fruit/seed collections. Preservation levels for macroremains were very poor, with not only few remains preserved but those found highly mineralized. This was probably due both to a lack of charring as well as highly basic soils, both of which negatively impact macroremain preservation. While pollen collections were richer, our data for plant consumption on-site was limited.

The small quantities of faunal material are more puzzling, as this is unlikely to be due to preservation issues and more a product of either consumption or discard patterns. Sites on the more sporadic end of the habitation spectrum lacked the cooking facilities where charred bone tends to accumulate. Living surfaces at San Martino and Poggio dell'Amore were universally very clean, while at Podere Terrato and Case Nuove these had been abraded and/or destroyed by plowing and erosion. There was, therefore, very little rubbish and, with the exception of Case Nuove, no dumps from these sites. The starkly different rubbish disposal patterns at these more sporadic sites versus sites with heavy production profiles and/or more long-term occupation, has been commented upon in Chapter 12. It means, however, that owing to the differential nature of rubbish collection/disposal and different kinds of sites, macroremain, and above all

faunal datasets, varied tremendously based on the site type.

Similarly problematic for discussions of diet and subsistence was the total absence of any skeletal material from the project: not only did Ghisleni's field survey identify virtually no potential necropolises,[1] but the excavations similarly failed to find any Roman-period graves, inhumation or cremation.[2] Data on malnutrition and disease, as well as DNA and isotope analysis that would have permitted analysis of movement and origins were impossible to collect.

In partial compensation for these data lacunae is a considerable body of secondary data which, while it does not replace the crucial primary dataset, does permit some insights into related practices. The pollen data, discussed in the preceding chapter, and the concomitant data on agricultural practices provided secondary indicators for agricultural regimes and the role of animals. Ceramics were analyzed for data on dining and cooking patterns and imported foodstuffs. The problem of storage, a critical part of the discussion on subsistence, was likewise considered through the prism of ceramic evidence as well as architectural remains. The movement study (see Ch. 17) yielded some indicators about the social networks that affected both food production and market access. Thus, while this study is unable to provide precise answers to some basic questions on Roman peasant diet and the vexed question of subsistence, it nonetheless offers some new data that challenge particularly the pessimistic image of peasant protein consumption and suggests a more complex set of storage and market practices than those encompassed by the traditional subsistence definition.

14.1 Dietary Staples: Grain, Legumes, Fruits and the Missing Vegetables (AMM, ER, RR)

Only four of the sites in the project produced macroremains for cereals mostly in tiny quantities with the exception of the Phase 2, 5th c. pit at Case Nuove and the Phase 2, 50–70 AD levels at Marzuolo (see Table 13.17). As noted above, cereal pollen was somewhat more prevalent but also particularly abundant at these two sites/phases.

In virtually all cases where cereals were present either as macroremains or as pollen, a mix of cereal genus and species were likewise present (see Table 13.7). Aside from undifferentiated Cerealia, most common and always present together as pollen are the Triticum and Hordeum groups, wheat and barley respectively. The two sites that produced cereal macroremains in any quantity, Case Nuove Phase 2 and Marzuolo Phase 2, likewise yielded both Triticum and Hordeum, and, since here we can distinguish individual species of cereals, the variety is even more notable. At Case Nuove, a site possibly used for cereal threshing in this period, *Triticum aestivum* (common or bread wheat), *Triticum dicoccum* (emmer wheat), *Triticum durum* (durum wheat), and *Triticum monococcum* (einkorn wheat or farro), as well as *Hordeum vulgare* (barley) were all present. At Marzuolo Phase 2, *Triticum aestivum*, *Triticum dicoccum*, as well as *Hordeum vulgare* were found. No millets were found in any of the sites or the pollen record and rye (*Secale cereale*) was found only in small quantities at Poggio dell'Amore and Podere Terrato.

As discussed in Chapter 6, this variety, which is consistent in both the pollen and macroremain record, describes a mixed cereal regime where a variety of different cereals with different uses, nutritional characteristics, and climatic requirements were grown simultaneously (cf. Spurr 1986:10–17). As this affects diet, this mixed regime probably presents a series of advantages, although we should remember that modern nutrient calculations for these cereals may be different from ancient ones (Heinrich and Erdkamp 2017; Heinrich 2019). Common or bread wheat (*T. aestivum*), a free-threshing wheat with low drought tolerance, was easiest to process and was prized by Romans for the fine bread it produced. Durum wheat (*T. durum*), another free-threshing wheat, did better under low-water conditions, was somewhat harder to thresh, but boasted a somewhat higher protein content and contained carotenoids, which help the body synthesize vitamin A. Durum wheat was occasionally also mixed into animal feed (Kron 2004). Emmer (*T. dicoccum*), a hulled wheat, was more tolerant of poor soils and climatic variation, more robust in storage, but more time consuming to process; for these reasons it might be fed to animals as well as humans. Its nutrient values, particularly in B vitamins and iron, are higher than the unhulled wheats. Like emmer, barley (*Hordeum vulgare*) could also be used as

fodder or food, was climatically adaptable and particularly high in protein. Contra one proposal, however, it does not seem to have been the dominant grain but, as in most documented cases, existed in a mix with other cereals (cf. Morley 2001:56). What seems to be the mixed cereal regime practiced by the locale's peasants would have yielded a flexible package of fine, higher-status breads and *puls* or cooked grains with higher protein and mineral contents (Hansen and Heinrich 2019). Their diverse ecological requirements would have sustained yields through the constant changes in yearly temperature and rainfall, as well as on the locale's variable land qualities.

It should be noted that such a mixed cereal regime was not, seemingly, distinct to this locale, nor, seemingly, to peasants. Much of the (admittedly small) published cereal data for Roman sites in Italy, urban and rural, wealthy and poor, find a variety of wheats being grown at individual sites/phases (Castelletti 1974; Spurr 1986:10–17; Motta 1993; Ciaraldi 2007; Robinson and Rowan 2015; Rowan 2017; Hansen and Heinrich 2019; Heinrich 2019). The better-documented patterns for the western provinces of the empire looks somewhat similar, with farms and villas alike cultivating a mixture of naked and hulled wheats, plus, depending on the region, barley, emmer, farro, and/or rye (Zech-Matterne, Weithold, and Pradat 2014; Salido Domínguez 2017:80). In northern France, it seems that both large and small farms might grow a preponderance of a collection of naked or hulled wheats, depending on their market contacts, along with a minority of other grains and legumes. This pattern suggests a mixture of wheats to obtain nutritional and/or culinary diversity, to integrate into animal feed, and to mitigate the risk of crop failure, was common Roman agricultural practice and not limited to peasants.

As noted in the previous chapter, all the sites that yielded important cereal pollen and/or macroremains also produced important legume remains (see Table 13.10). In the pollen record, these are mostly documented by either undifferentiated leguminous plants (Fabacaea) or species potentially used as animal fodder including various members of the vetch (*Astragalus, Vicia sativa*), medic (*Medicago*), and/or clover *(Trifolium)* families.

Where macroremains permit us to be more specific about legumes in the human diet, the most common of these, aside from the Legumes undiff. or Fabaceae undiff. categories, are lentils (*Lens culinaris*) and broad beans (*Vicia faba*), present in small quantities at Marzuolo Phase 2, and Case Nuove Phases 1.2 and 2. Their quantities here are too small to attest to anything more than their consumption at these sites, but it is notable, again, that they always appear in the presence of cereal remains.

Legumes are associated in the Roman literary tradition with the poor and the army (Corbier 1999), but like many "poor" foods, it appears everyone ate them and they comprised an important, protein-rich part of the diet, particularly when eaten in combination with cereals (Spurr 1986:103–116). Lentils and broad beans were among the most common legumes eaten in Roman Italy (Spurr 1986). In addition to soil sustainability, ease of planting and threshing and their use as animal fodder (discussed above, Ch. 12), legumes, like lentil and broad bean, present a variety of dietary advantages. They contain about twice the protein of cereals and, thus, a diet that mixes cereals and legumes can potentially avoid the protein and mineral deficiencies of a cereal-only diet. Legumes are rich in B vitamins like folate, potassium, iron, and magnesium, complementing the A vitamin-producing Durum wheat noted above. A cereal-legume mixed diet could also yield an amino acid mixture of methionine (legumes) with lysine (cereals) and, thus, having more complete protein-building potential (Heinrich and Erdkamp 2017).

Spurr (1986:103–116) has argued that legumes were grown in quantity in Roman Italy and formed a major part of elite and non-elite diets alike. More recent botanical data has supported this, pointing to significant legume consumption at elite and non-elite sites alike (Motta 1993; Kron 2004; Ciaraldi 2007; Robinson and Rowan 2015). While the evidence from project sites is fragmented, the pollen and macroremains together suggest that legumes were central to both rotation/fodder schemes and dietary regimes and were eaten in combination with cereals.

The most common fruit present at all sites are the seeds of olives, followed by grapes, blackberries (*Rubus fruticosus*, Podere Terrato), figs (*Ficus carica*, San Martino) and walnut (*Juglans regia,* Case Nuove Phase 1.3 and 2). Marzuolo Phases 2 and 3 present a particular abundance and diversity of fruits, including dogwood cherry (*Cornus mas*), dogwood (*Cornus sanguinea*), walnut, unidentified members of the apple family (Maloideae undiff), plum (*Prunus persica*),

and blackberry, as well as olive and grape. Many of these species could be cultivated or their fruit harvested from wild-growing plants: regardless, Marzuolo Phase 2 illustrates the diversity of fruits found in the diet of the craftspeople and families living at this ceramic production site.

None of these sites produced any "exotics" like citrus or spices and their absence is seemingly typical of peasant sites outside Italy as well (Bakels and Jacomet 2003 Veen 2008). The fruits found are those most typical and prevalent in sites from Roman Italy, elite and non-elite alike (e.g., Costantini 1983; Motta 1993; Ciaraldi 2007). It is likewise impossible to distinguish between wild and domesticated species of most fruits found here. However, even were they all gathered from the wild, this should not diminish their importance to the overall picture of peasant diet. Wild fruits appear in Roman elite and poor sites alike (Jones 1985; Motta 1993). A recently discovered cache of apple seeds from a Roman villa on nearby Elba may have been from wild apples (*Malus sylvestris*) intended for cider making (Milanesi et al. 2016). Outside Italy, wild species seemed to have been gathered with increasing frequency and diversity with the advent of Roman rule (Veen 2008). Rather than a lesser foodstuff to the imported and grafted species so beloved by Roman agronomists, foraged fruits and nuts seem to have been a part of all Roman's diet and added significantly to their dietary diversity (cf. Barker 2006).

Vegetables are typically underrepresented in the archaeobotanical record (Willerdig 1991; Zohary and Hopf 1994) and our sites yielded very limited data for vegetable consumption. Only one site produced significant evidence for garden vegetables, namely Podere Terrato (see Ch. 9). Here macroremains of garden orache (*Atriplex hortensis*) and celery (*Apium graveolens*), together with the pollen evidence for a series of flowering plants and herbs, suggested a possible garden. Garden orache was also present at San Martino and Marzuolo and generic Atriplex pollen at Colle Massari. Most sites produced pollen of the Brassicacae family: these includes various mustards but also cabbage (*Brassica oleracea*). Pollen cores in Naples revealed high levels of Brassicacae pollen interpreted as cabbage eaten in quantity in the city (Russo Ermoldi et al. 2013), but, given the absence of macroremains or specific pollen for *Brassica oleracea*, cabbage consumption cannot be proven here.

14.2 Meat in the Peasant Diet (MM)

As noted in the introduction to this chapter, the question of protein in the peasant diet has been an important one in the debates over peasant nutrition and health. As discussed above, the mixed grain and legume strategies practiced by rural dwellers in the project area would have added plant proteins to the diet, although we cannot be more precise about quantities or frequency of consumption given the tiny quantities preserved at our sites. The evidence for meat consumption is somewhat better; while many of the sites on the sporadic end of the occupation spectrum produced very few faunal remains, the data from other sites suggests that meat was commonly, if not always frequently consumed by peasants in the project area, while secondary data points to a significant presence of milk.

Although exceptions exist, the bulk of faunal remains recovered from ancient sites typically relate most directly to consumption of meat and, to a lesser degree, the processing of bones and hides. It is important first to view zooarchaeological finds in light of their context of deposition and recovery. While the number of faunal remains retrieved across sites varied, the nature of the materials collected and underlying taphonomic conditions were broadly similar, suggesting that fairly comparable depositional and post-depositional agents operated across contexts. Although some contexts produced relatively more abundant collections of animal bones than others (e.g., Pievina SU 1006, a rubbish pit, was among the most concentrated of faunal deposits), overall, no clear-cut, sizeable middens with substantial, well-dated accumulations of faunal remains were noted. Most bone specimens across the sites examined rank in "fair" condition (assuming a scale of excellent-good-fair-poor). Chiefly, scraps, rather than complete bones are represented; many pieces are brittle and exhibit post-depositional fracture lines and breakage resulting from the mechanical, chemical, and structural pressures from burial in and exposure to the clay sediments that cover much of the region. Juvenile bones are general poorly represented, although more teeth from younger animals were recovered, a factor of differential preservation (i.e., teeth survive better than bones, regardless of the age of the animals). Carnivore damage and sun-bleaching were infrequent, a fact that further suggests faunal materials

were not left exposed on the surface. Thus, it seems, what faunal waste did accumulate was protected to a certain degree from surface agents. In many respects, the bulk of the faunal remains collected represent somewhat peripheral waste, such as miscellaneous bits of trash or haphazard rubbish that might accumulate during episodes of construction, destruction, or abandonment.

Given that very few faunal remains were recovered from sites where sporadic, temporary settlement was hypothesized (e.g., San Martino, Poggio dell'Amore), little can be measured about dietary aspects among these spots. It would seem that these complexes were kept fairly clean, with any faunal waste presumably removed off-site. Larger collections of zooarchaeological materials are associated with more permanent/production sites from the project area (e.g., Pievina, Marzuolo, Case Nuove), but typically not from any living surfaces within these complexes. Rather, waste may have been tolerated to a greater extent under conditions of change at these sites. Some of the larger samples derive from fills of negative features, such as pits, cisterns, or cuts in the sediment (e.g., Case Nuove, Tombarelle), or as accumulations that preceded longer phases of abandonment, notably, in this case, activity during late antiquity (e.g., Pievina, Case Nuove, Marzuolo, Tombarelle). Practical reasons likely also play a role. Late antique settlements, at many sites, sit directly above earlier phases, a chronological progression that can severely damage or destroy underlying deposits, in some cases even necessitating a leveling of those earlier phases. Overall, it is apparent that practices of rubbish disposal and occupation affect the faunal materials collected and, in turn, have an impact on our ability to parse out cultural habits related to diet.

Chapter 13, Tables 13.13–13.15 overview relative frequencies of various skeletal part categories for cattle, sheep/goat, and pig, respectively, by NISP and MNE counts. In this case, MNE was calculated as an element-wise MNI count and represents the minimum number of individual animals required to comprise that particular category of elements. These tables provide a gauge of potential biases among different categories of cuts or quality of meat, which in turn may provide clues as to any import or export of meat cuts to a site, as well as cultural choices in the selection, retention, and disposal of different parts of an animal's carcass. Table 13.16 lists relative frequency values for the component of the faunal sample that did not comprise the NISP count, proper, but rather was assessed within broader skeletal-part and animal-size categories. Typically, these materials are often fragmentary bits from ribs, vertebrae, long bones, and other parts of the skeleton that could not be securely identified to both element and species, but nevertheless are still essential in tracking data for skeletal parts as a whole. Thus, Table 13.16 helps add dimensions for ribs, long bone fragments, and vertebrae, categories that are not expressly tabulated in Tables 13.13–13.15.

Pooling the evidence initially reveals some general trends. First, it is apparent that the bulk of the meat consumed derives from domestic mammals—pigs, sheep/goat, and cattle. Wild animals are usually rare, although a few exceptions to this pattern exist. Domestic fowl are also generally infrequent, but again there is some variability across sites in this regard.

In comparing data from Tables 13.13–13.16, there are perhaps far more similarities in relative frequency counts by skeletal part for each taxon among sites than there are differences between them. This is perhaps best noted in comparisons of MNE statistics, where frequency values for each of the four categories provided (i.e., primary cut, secondary cut, limb extremities, and head+teeth) are fairly equal. Exceptions do exist, but overall there are no significant discrepancies among these figures to suggest marked import or export of skeletal parts to or from any site or context. In other words, two scenarios seem to apply fairly universally across these sites. First, all sites seemed to have been supplied with whole animals, presumably acquired locally given the costs of transport or shipment of livestock otherwise (excluding, in this case movements on the hoof by transhumant flocks). Second, steps involved in the processes to skin, gut, disarticulate, fillet, and cook meat from these animals do not seem to be firmly separated spatially at any individual site. In other words, trash from all stages in the animal processing and cooking continuum appears together among most assemblages. Such might be indicative of smaller-scale butchery and consumption ventures, as opposed to (i) significant-scale marketing or commercialization of animal parts (where, for example "better-quality" cuts, might be retained or exported) or (ii) any marked compartmentalization of butchery

or cooking operations (as might exist if such activities were set along some industrial or professional scale). Overall, animals seem to have been raised and herded in the region; consumption was also a local phenomenon, with livestock slaughtered, butchered, processed, consumed (and waste products discarded) locally. Although local consumption patterns seem to underlie each site, there can still be some unevenness in how parts of these animals were deposited spatially within each site, which in turn may indicate a measure of internal cultural variation.

A local origin for many of the livestock represented among the sites in the project area is indicated by patterning within available metric data. Mean sizes for any individual taxon—especially cattle, sheep/goat, pig—are not notably different across sites, although some sites register a wider range of values. Marzuolo and Case Nuove, for example, yield a greater range among values for any given taxon than does Pievina, but whether or not this suggests access to a larger diversity of stock at Marzuolo and Case Nuove, as opposed to Pievina is debatable given the limited pool of metric data available overall. Regardless, the spread in values both within any single site, and across sites, implies the presence of different breeds of livestock, that is a range of various types of cattle, sheep/goat, or pig. Thus, both larger and smaller representatives for these taxa are noted across sites, with no significant concentration of any size category for any particular location.

Sites are further united in displaying similar temporal trends for animal size within any single taxon. The mean sizes of cattle, sheep/goat, and pig, for example, all tend to increase slightly through imperial times, only to decline somewhat into late antiquity. Indeed, the data conform well to trends observed for wider Roman Italy, as a whole, notably in the attention to breeding larger stock during imperial times (MacKinnon 2004). Given these levels of conformity in metric data and overall animal size both within and outside the project area, it would appear that "peasant" sites were not necessarily restricted in livestock choices, having to make do with poor-quality, small animals; in fact it seems that they had access to the diversity of breeds and stock that characterized the wider area more generally.

A final aspect that binds the faunal data are broad temporal trends. While the overall frequencies for the principal taxa—cattle, sheep/goat, and pig—fluctuate depending upon the site and temporal period (see Ch. 6), in general the dietary contribution of pigs tends to elevate through the late Republic, and into the early empire, only to decline somewhat, in favor of sheep/goat, into late antiquity. These trends are usually noted among the wider array of sites in Tuscany (see Table 13.17, Figs. 13.17 and 13.18), and suggest a type of cultural cohesion. The augmented values for pig have often been connected with a "Romanized" dietary penchant, and associated cultural demand, for pork, while the increase in sheep/goat values into late antiquity has been linked to a decentralization of the landscape and a shift to smaller, pastoral operations. Focusing specifically on the zooarchaeological samples from Pievina, there are really no marked differences in the frequency values for cattle, sheep/goat, and pig for that site, when compared alongside many other sites of similar temporal brackets. Thus, it would appear that Pievina, arguably a smaller-scale site, presumably populated by non-elite occupants, followed general contemporary faunal trends that affected larger sites, both urban and rural, as well as elite sites (again both urban and rural). This attests to a level of commonality among sites, at least in terms of choice of taxa.

Nevertheless, the degree to which sites were affected by events and trends in the larger Roman and late antique world was not uniform. Differences principally are a factor of size, function, and socio-economic stature of the sites in question. Relatively wealthier Roman sites, such as the rural villas at Settefinestre, Ossaia, Le Colonne, and Monte Gelato register very high frequencies for pig, a testament to their own particular "Romanized" diets, as well as their capacity to support wider cultural demands (especially from urban locales), by specializing in pork production. These rural villa sites often incorporate a range of wild animals as well, further solidifying the elite nature of the meat diets there. In many cases, younger animals predominate among these wealthier sites as well, another potential sign of dietary prestige. Moreover, their assemblages tend to skew in favor of better-quality meat, such as that associated with primary cuts, ribs and vertebrae. Pievina mimics overall early imperial patterns in registering a significant amount of pig bones, but unlike its elite counterparts, Pievina did not contain an abundance of younger animals, wild animals, or choice cuts of meat. It is clearly not high status in this regard. This

pattern of "lower-quality" meat remains fairly consistent at the site throughout time. Aspects do adjust over time at Pievina, and some of these changes correspond to trends affecting the larger Roman diet and economy, but available faunal data suggest that these components were, in part, muted at Pievina, compared to other sites, especially wealthier villa sites and urban locales. Overall, consistency remains a fairly key principle at Pievina—both in terms of animal husbandry tactics and in the type and quality of meat incorporated into the occupants' diet.

While zooarchaeological evidence for Pievina may support notions that peasants, even if they did consume meat, were not typically eating choice-quality meat, and may have been somewhat limited in their selection to animals of a smaller range of sizes overall, results from other sites in the project area reveal different dimensions to this equation. The marked abundance of younger and juvenile animals in the Phase 1.2 tank deposits at Case Nuove (1st c. BC–1st c. AD), including young domestic fowl, is significant and stands in contrast to contemporary deposits from Pievina. Although Pievina records fairly similar NISP frequency statistics for pigs and sheep/goat compared with Case Nuove for roughly the same time period (see Table 13.11—both sites register ca. 60% pigs and ca. 30% sheep/goat), far older ovicaprids and pigs comprise the Pievina sample. Moreover, at Pievina, domestic fowl are insignificant, whereas at Case Nuove, they form a large portion (24%) of the bones retrieved from the tank context. Available evidence, suggests a somewhat wealthier or privileged diet at Case Nuove, one where younger animals, particularly choice domestic meat animals as well as a larger proportion of better-quality primary meat cuts (including ribs) from these animals formed a central component of the diet (see Tables 13.13–13.15).

A note should be made here about the contribution of domestic fowl to "peasant" diets. As noted above, the Phase 1.2 deposits from Case Nuove contained a fairly sizeable collection of domestic fowl bones; in fact, it registers as the highest single concentration of fowl from any of the comparative sites listed in Table 13.17. While it is certainly the case that preservation and recovery biases can reduce the number of avian bones retrieved from any one site, average values for domestic fowl rarely exceed 5–10% for any Roman site in Italy, including those from the project area. On the basis of these data, it seems that domestic fowl figured as a small, presumably locally produced supplemental meat. Certainly eggs could also be exploited, and fowl may have been principally kept for that resource. Nevertheless, the rather small input of domestic fowl across the range of Roman sites—urban/rural, rich/poor—dispels any assumption that "peasant" households were any different than other social classes in antiquity in their access to, and consumption of, poultry birds.

The second, substantial faunal sample from the site of Case Nuove derives from the Phase 2 dump and dates to the 4th–5th c. AD. Like the Phase 1.2 contexts, pigs, ovicaprids, and domestic fowl comprise a significant amount of the bones. Cattle, a species absent from earlier dietary deposits at the site, now also register, accounting for about 20% of the principal consumable domesticates by NISP and MNI tallies (Tables 13.11 and 13.12). Dental elements predominate across all these taxa in this assemblage, presumably a taphonomic bias, as opposed to any specific acquisition of head/teeth elements or export of postcranial parts. Rather, there are lots of rib and long bone fragments to suggest fairly whole carcasses were utilized. More importantly, younger animals comprise the majority of this late antique assemblage, which also records about 5% red deer, one of the more significant contributions of game to dietary samples among the project area. As argued for the Phase 1.2 contexts, the high numbers of younger animals in the late antique phases also suggest dietary wealth. The presence of remains of fetal and newborn pigs in the late antique deposits reinforces a local origin of these animals.

Overall, Pievina and Case Nuove display two basic differences as regards the contribution of meat in the diet across the two principal temporal periods common to both (i.e., late Republican/early imperial, and late antiquity): first, in the ages of the animals noted (younger domesticates at Case Nuove, in both phases); second, in a higher frequency of domestic fowl at Case Nuove (again during both phases). The differences fit best with variations in social status. Case Nuove, located near the one villa in the study area, contains faunal waste that displays features coincident with higher-status diets. Indeed, the faunal patterns from late antique Santa Marta, with its younger animals, greater quantities of pig, fowl, and hunted animals, epitomizes the elite villa animal diet (see Table 13.17). If "peasants" have left an archaeological imprint on

Case Nuove, then available zooarchaeological data for that site suggest not only that these people ate meat (even if seasonally, when the pressing structures at Case Nuove were in use), but that otherwise "elite" type meats (i.e., younger animals, better-quality cuts, and game) were consumed.

Faunal materials from the site of Marzuolo add further texture to this mixed picture of "peasant" diet. Zooarchaeological patterns at Marzuolo are not markedly divergent from the general cultural patterns evident for our area and among other Roman and late antique faunal samples from wider central Italian region (see Table 13.17). Moreover, there is a general balance among skeletal parts (including ribs and vertebrae) for all consumed domestic taxa (i.e., cattle, ovicaprids, and pigs) among contexts at Marzuolo, suggesting no noticeable import or export in butchered sections of meat. Where Marzuolo might differ from other sites in the project area concerns two central aspects: (i) the elevated proportion of cattle, especially in Phase 1 levels; (ii) a relatively higher frequency of younger animals.

As noted above, Phase 1 contexts at Marzuolo contained a reasonably high frequency of cattle bones (ca. 33%, by NISP counts, see Table 13.11), alongside pigs (ca. 48%) and sheep/goat (ca. 19%). Other animals are comparatively rare. All of these taxa, including the cattle were eventually consumed, as indicated by the high frequency of chop and cut marks across elements, regardless of animal. In fact, the incidence of butchery marks on the cattle bones from these contexts is among the highest from across sites excavated in the project area. Clearly, the individuals who eventually disposed of these cattle bones in these deposits felt a need to disarticulate and butcher them in a rather rigorous, but still controlled fashion. Age profiles indicate a mix of subadult and adult cattle (both oxen and cows), but with a slight bias towards older individuals. The presence of mixed age groups might signify some resident production of cattle, perhaps tied with localized keeping of stock for traction and possibly milking. That there are so many cattle in these Phase 1 Marzuolo deposits, compared to other parts of the site, might also link with a specialized role to the area, notably in its capacity as a ceramic manufacturing center and/or to plow its nearby cereal fields. Traction and plow cattle, as well as birthing cows, may have been stabled nearby to provide work stock as required, and to assure new supplies through controlled birthing schemes and management. With more cattle on hand, more might be culled and consumed as warranted by site occupants. Thus, patterns here may tie to practical and efficient measures in utilizing and handling livestock, as opposed to any status, class, or cultural preference for beef. By way of comparison from central Italy, the *mansio* site at Vacanas (1st–2nd c. AD contexts) (Cerilli 2005), the rural site at Tenuta di Vallerano (Minniti 2005), and the settlement at Il Monte-San Gimignano (Prillof 2013) require comment, as their faunal patterns are likewise relatively higher for cattle. These higher values are likely a function of the particular contexts excavated than of overall dietary patterns. The elevated number of horse bones coincident with cattle bones from the site of Tenuta di Vallerano suggests a deposit biased in favor of remains from work and transport animals (killed, perhaps in a more focused manner) than regular dietary waste.

Proportionally, Marzuolo sits among those sites showing a relatively higher frequency of juvenile and subadult stock, similar to Case Nuove, but different from Pievina and many of the smaller sites. This is predominantly the case for Phases 1 and 3 at Marzuolo. While the presence of juvenile and subadult pigs is typical across most Roman zooarchaeological assemblages from the area and need not imply any socioeconomic or dietary discrepancy, the fairly regular occurrence of juvenile and subadult ovicaprids among the Marzuolo contexts implies some flexibility to slaughter animals that might otherwise be kept into adulthood to provide valuable, renewable, secondary products (e.g., wool, hair, milk, manure). While younger ovicaprids may be more succulent, tastier, and, presumably, more expensive than their adult counterparts, their presence need not always ally with wealthier diets, especially if these animals are properly managed. Moreover, drawing together ovicaprid flocks, seasonally, to a central assembly point (which the area around Marzuolo may have been) could have facilitated selective culling, a practice that might be more effective for herd vitality. If, in pooling resources, decisions were made to slaughter more young animals for the betterment of the herd overall, this is a choice made with long-standing, practical, efficient goals in place, and not something in line with dietary ostentation or excessive signs of wealth. Marzuolo may be subscribing to this tactic, but then again it may also be that workers here

consumed better-quality ovicaprid meats as well. Whatever the expression, a level of complexity is certainly visible in these operations.

Much like Marzuolo and Case Nuove, available zooarchaeological data for the site of Tombarelle also yield fairly diversified results as regards dietary reconstructions. Phase 1 deposits exhibited larger pieces of adult cattle, deer, and wild boar. Moreover, about 20% of these bones display cut or chop marks from disarticulation of joints and filleting of bigger chunks from the bone. The bones likely represent food and carcass processing waste but are rather mixed in this regard. On the one hand, the rarity of materials linked to "better-quality" meats, in this case primary cuts, ribs, and vertebrae, as well as bones from younger animals, tie the assemblage to what may be considered a "lower-status" diet. On the other hand, the fairly high frequency of game animals, notably deer and wild boar, within the deposit generally imply hunting, a purview of the Roman elite, and not something one might typically connect with "peasant" lifestyles. Hunting in antiquity was often regulated with access to forested properties restricted or limited (MacKinnon 2004). While it is possible that the wild animals from the Tombarelle Phase 1 assemblage were acquired through somewhat opportunistic means (poached? scavenged?) this seems unlikely. The wild boar from this context is represented by four isolated canine teeth, all from older adult males, and all distinctly massive, hallmarks that might otherwise suggest social messages of bravado, hunting prowess, or trophy acquisitions. By way of comparison, wild animals are rare among the majority of sites across the project area, and the wider geographic region (see Table 13.17). They do register with slightly greater frequency among elite rural villa sites than among smaller sites in rural areas, but are notably scarce among urban locales, even places of great wealth. It would seem that despite a perceived link of wild taxa with augmented dietary wealth in Roman antiquity, the option to express this was not always available (or preferable) to those who could otherwise afford it. Meat from domestic animals could be much more easily accessed, among rich or poor alike.

Zooarchaeological remains from Tombarelle Phase 3 are also mixed in nature and add a different level of nuance to overall interpretations of peasant diets. As described in Chapter 11, the late antique contexts represent an infill episode done in relative haste, in which larger, chunkier, bulkier materials seemed to have been (selectively?) chosen. Cattle dominate (46% by NISP count, see Table 13.11), but, as regards dietary reconstructions, it is important to set this observation within its proper context. These cattle are chiefly adults (75%), with one subadult (ca. 25%). This indicates their central use for work purposes, as opposed to any concentration on production of dietary beef and veal. Sheep/goat are represented only by adults (with a 2:1 ratio of sheep/goat). Adult and subadult pigs are included, with a balance between males and females. Overall, Tombarelle shows no more variation among these parameters than is the case with the typical late antique faunal assemblage across other sites of consideration here. Metric data for animal sizes also conform among sites. Overall, a stronger argument can be made that if age, sex, and breed/size data for cattle, sheep/goat, and pig among these sites overlap then it would seem odd that Tombarelle was truly registering some specialized economic/dietary scheme that favored cattle in any grand, permanent scheme at the site. The cattle from this deposit seem to be chosen because they represent large pieces of faunal waste that might otherwise need rapid disposal in any cleaning/clearing/infilling episode, so their collection and fill here may be more opportunistic and specific, than reflective of general dietary and economic patterns overall. Nevertheless, while taphonomic factors may bias livestock frequencies for this deposit, it is still the case that these cattle were consumed, even if (as argued above) it seems unlikely to represent a beef-heavy diet overall.

While some differential access and deposition as regards animal age classes and cuts of meat characterizes various assemblages in the project area, this does not translate to variation in how these animals were butchered. Regardless of the choice of species or cut of meat, data from the project underline relatively common features in butchery methods employed among each. Available butchery data conform to relatively standardized procedures noted among Roman sites in general. Cattle, sheep/goat, and pigs all record some butchered bones. Cleavers were used more regularly to disjoint and section carcass parts (e.g., cuts at articular ends of long bones, at the shoulder, in the pelvis area, and around the ankle), while knives assisted in filleting meat from the bone (e.g., removal of tongue and jowl muscles) and in more delicate operations, such as hide removal

(e.g., phalanges). Variability in cut and chop placement, depth, and frequency suggest butchery was not the exclusive domain of skilled professionals; some level of household, or at least smaller-scale, operations existed. Even at this level, however, butchery procedures were standardized enough to indicate that whomever did the job had at least a rudimentary knowledge of skeletal anatomy. The chops are not purely random hacks, but are concentrated at the joints, where disarticulation is easiest. Overall, the butchery process and technology did not change significantly over time among any site. In some measure, this relates to the fact that there is little room for dramatic variation in carcass butchery and dismemberment—it follows a fairly standard procedure—so one might expect uniformity over time, especially in pre-industrial and unmechanized cultures using only cleaver, knives, and choppers in the process.

14.3 Cooking and Diet (MM, EV, KB)

In Roman archaeology studies of diet—often considered an economic subject—are dissociated from cooking and eating—often considered social ones. Given that both diet and dining represent different aspects of humans' relationships with food, this seems a potentially misleading separation and new work on Roman ceramics and food culture is following the example of prehistoric archaeology and uniting the two problems (Cool 2006; Deru and González Villaescusa 2014; Spataro and Villing 2015). In this project, evidence for cooking and dining was often more abundant than the biological remains of the meals themselves and, thus, it makes particular sense to consider that evidence for what it reveals about the full spectrum of peasants' relationships with food.

The evidence of cooking wares is particularly revealing of both the kinds of meals consumed on these sites and as possible secondary evidence for the nature of ingredients (cf. Vaccaro and MacKinnon 2014). Across sites the kinds of cooking wares, considered together with the faunal assemblages, reveal a diversity of diet and culinary practices across sites and over time.

The example of Pievina and Case Nuove in their earliest phases provides a useful illustration. Both Pievina and Case Nuove produced middens of the 2nd half of the 1st c. BC—at Pievina from the period of the possible farm, and from Case Nuove when the site was used as a collective rural press (see Chs. 4 and 5). In both sites, the most common cooking ware was the cooking pot (23 and 17% MNI, respectively) (Table 14.1). Cooking pots are used for cooking methods involving water, stewing or boiling, and are particularly adapted for stews and soups. Open kitchen vessels such as casseroles are less common at both sites and are represented by large open dishes (*tegami*) (6% at each site) manufactured in both kitchen ware and in *vernice rossa interna*. These dishes were better suited to roasting and braising rather than techniques that required water retention. A preference for cooking pots is likewise tentatively evidenced from somewhat earlier San Martino, where a few MNI of cooking pots represent the only cooking wares, accompanied by rare lids.

As noted above, Case Nuove and Pievina produced small faunal assemblages in these phases attesting to consumption of the three chief domesticates (see Table 13.11). At Case Nuove cattle (50% NISP) predominate while Pievina displays a preference for pigs (61% NISP). Despite the species difference, both sites show common butchery patterns consistent with stewing and boiling: spiral fracturing produced by the extraction of marrow and the small-sized cuts typical of boiling/stewing. Charred bones are almost entirely absent from these assemblages, indicating a disinclination for roasting. At Pievina, the only assemblage large enough to gauge age patterns, the cattle and sheep/goat assemblages were dominated by older animals, whose tough, stringy meat would likewise have been best adapted to stewing.

While we lack macroremains from these sites/phases, it is also important to emphasize the plant-based culinary practices implied by these ceramic forms. Barley, farro, spelt, and other grains are often part of soups, or cooked alone as is the case of farro, known in the Roman world as *puls*. The cooking pots that predominate at Pievina and Case Nuove Phase 1 could also have been used to cook these grains.

At Case Nuove, it is possible to document a shift in this dietary pattern over time accompanied by a possible change in demographic. As discussed in Chapter 5, we have hypothesized that the site was abandoned and its pressing tank used as a dump after the large farm at Santa Marta, to which it was

Table 14.1 Ceramics, formal classes, all sites (%MNI) (EV).

FORMS	Pievina Phase 1	Pievina Phase 2.2	Case Nuove Phase 1	Case Nuove Phase 1.2	Case Nuove Phase 1.3	Case Nuove Phase 2	San Martino	Poggio dell'Amore	Colle Massari Romano
Diagnostics	**159**	**310**	**117**	**174**	**92**	**190**	**85**	**41**	**13**
MNI	**30**	**232**	**45**	**50**	**27**	**72**	**47**	**21**	**11**
KITCHEN (includes KW and VRI)	**50**	**25.86**	**44.44**	**26**	**22**	**37.5**	**38**	**28.56**	**45.45**
Generic closed forms for kitchen	0	0.86	0	0	0	0	0	0	0
Cooking pots	23.33	13.36	17.77	14	7.4	25	15.53	9.52	18.18
Cooking jugs	3.33	0.43	4.44	0	0	0	0	0	0
Generic open forms for kitchen	0	0	0	0	0	0	0	0	0
Casseroles	0	1.29	0	4	3.7	1.38	0	9.52	0
Cooking bowls	0	0.43	2.22	0	0	0	2.12	4.76	9.09
Frying pans/*tegami*	6.66	0.43	6.66	2	3.7	1.38	0	0	9.09
Bread-baking pans/*testi*	0	0	0	0	0	0	0	0	0
Clibani	0	2.5	0	0	0	2.77	0	0	0
Cooking lids	16.66	6.46	8.88	6	7.4	6.94	10.63	4.76	9.09
DINING/STORING (includes CW, FW, and CCW)	**43.33**	**58.61**	**46.66**	**58**	**40.7**	**61.1**	**44.68**	**61.88**	**27.27**
Generic closed forms for table and storage	0	9.05	0	0	0	0	0	0	0
Jugs	10	8.62	4.44	6	7.4	0	2.12	14.28	9.09
Jars	0	0.86	0	0	0	2.77	2.12	4.76	9.09
Jugs/jars	0	0	0	0	0	6.94	0	0	0
Beakers	0	0	6.66	4	0	0	2.12	0	0
Small table pot	0	0.43	2.22	0	0	1.38	6.38	0	0
Bottles	3.33	0	0	0	0	0	2.12	0	0
Flasks	3.33	0	0	2	0	1.38	0	0	0
Chalice	0	0	0	2	0	0	2.12	0	0
Flanged-Bowls	0	2.5	0	0	0	0	0	0	0
Generic opens forms for table	0	0	4.44	2	0	0	2.12	4.76	0
Bowls	16.66	6.03	15.55	8	7.4	15.27	2.12	0	0
Cups	10	0	0	12	0	0	6.38	5	9.09
Dishes	0	11.63	8.88	12	3.7	23.61	12.76	14.28	0
Bowls/Dishes	0	9.05	0	4	11.11	0	2.12	0	0
Basins	0	7.75	0	0	7.4	6.94	2.12	0	0
Lids	0	2.15	0	6	3.7	0	0	0	0
Small vessels for sauces or perfumes(?)	0	0	0	0	0	2.77	0	0	0
Uncertain (food processing?)	0	0	0	0	0	0	0	0	0
Mortaria	0	0	4.44	0	0	0	0	0	0
TRANSPORT and STORAGE	**6.66**	**11.2**	**8.51**	**10**	**33.32**	**1.38**	**12.76**	**9.52**	**18.18**
Amphora stoppers	0	0	0	2	0	0	0	0	0
Amphorae	26.66	10.34	8.88	8	18.51	1.38	8.51	9.52	18.18
Dolia	0	0.43	0	0	14.81	0	2.12	0	0
Table amph/jar	0	0.43	4.44	0	0	0	2.12	0	0

	Podere Terrato	Marzuolo Phase 1	Marzuolo Phase 2	Marzuolo Phase 3	Tombarelle Phase 1	Tombarelle Phase 2	Tombarelle Phase 3	Overall Avg.	Avg. Late Republican/ Early imperial	Avg. 2nd–3rd c. AD	Avg. late antique
	102	**730**	**3014**	**533**	**275**	**34**	**367**				
	62	**421**	**334**	**251**	**109**	**29**	**190**				
	17.74	**20.66**	**2.69**	**27.49**	**24.77**	**27.5**	**7.36**	**21.71**	**29.62**	**24.745**	**23.57**
	0	0	0	0	0	0	0	6.39	0.00	0	0.29
	6.45	12.58	1.49	8.76	8.25	10.34	11.57	12.72	12.49	8.08	14.76
	1.61	0	0	0.39	0	0	0	0.64	0.85	0.195	0.14
	0	0	0	0	0	0	0	0.00	0.00	0	0.00
	3.22	0.71	0.29	6.37	0	3.44	4.73	2.42	1.93	5.035	2.47
	0	0.47	0	0.79	0	3.44	0.52	1.49	2.01	0.395	0.32
	4.83	2.61	0.89	5.97	4.58	10.34	0	3.70	4.33	0.395	0.60
	0	0.47	0	0	5.5	0	0	0.37	0.54	0	0.00
	0	0	0	0	0	0	1.57	0.43	0.00	0	2.28
	1.61	3.8	0	5.17	6.42	0	3.15	6.06	6.17	6.285	5.52
	74.19	**67.69**	**85.02**	**47.01**	**67.88**	**62.06**	**76.84**	**57.68**	**58.06**	**43.855**	**65.52**
	11.29	5.22	0	3.58	0	0	3.15	2.02	1.50	1.79	4.07
	16.12	6.17	2.09	9.56	21.1	24.13	8.42	9.35	10.50	8.48	5.68
	1.61	1.66	0.89	2.39	4.58	3.44	1.57	2.23	2.56	1.195	1.73
	0	2.13	0.59	0	4.58	0	6.31	1.28	0.66	0	4.42
	4.83	4.27	0.59	1.99	2.75	3.44	0.52	1.95	2.61	0.995	0.17
	3.22	2.13	1.79	2.39	0	0	1.05	1.31	1.43	1.195	0.95
	0	2.85	0	1.99	2.75	0	3.15	1.01	1.00	0.995	1.05
	0	0	0	0	0	0	0	0.42	0.48	0	0.46
	0	0	3.29	0.79	0	0	0	0.51	0.67	0.395	0.00
	0	0	0	0	1.83	0	0	0.27	0.17	0	0.83
	1.61	1.9	0.29	1.19	0	0	0	1.14	1.56	0.595	5.39
	0	12.58	0	7.56	12.84	3.44	9.47	7.31	6.47	7.48	10.26
	14.51	8.78	34.13	3.18	1.83	10.34	0	7.20	10.19	1.59	0.00
	19.35	18.05	39.22	8.36	14.67	17.24	22.1	14.12	14.22	6.03	19.11
	0	0	0	0.39	0	0	0	1.67	0.56	5.75	3.02
	1.61	1.18	0	1.59	0	0	19.47	3.00	0.45	4.495	11.39
	0	0.71	2.09	1.99	0	0	1.05	1.11	0.80	5.69	1.07
	0	0	0	0	0.91	0	0	0.23	0.09	0	0.92
	0	0	0	0	0	0	0.52	0.03	0.00	0	0.17
	0	0	0	0	0	0	0	0.28	0.44	0	0.00
	8.06	**6.65**	**11.97**	**19.92**	**5.5**	**6.89**	**1.57**	**10.76**	**9.80**	**26.62**	**4.72**
	0	0	0	1.99	0	0	0	0.25	0.18	0.995	0.00
	8.06	4.98	11.97	16.73	5,5	6.89	1.05	10.64	6.68	17.62	4.26
	0	0.47	0	0.79	0	0	0.52	1.20	0.24	7.8	0.32
	0	1.18	0	0.39	0	0	0	0.54	0.70	0.195	0.14

Table 14.1 cont'd Ceramics, formal classes, all sites (%MNI) (EV).

FORMS	Pievina Phase 1	Pievina Phase 2.2	Case Nuove Phase 1	Case Nuove Phase 1.2	Case Nuove Phase 1.3	Case Nuove Phase 2	San Martino	Poggio dell'Amore	Colle Massari Romano
Diagnostics	159	310	117	174	92	190	85	41	13
MNI	30	232	45	50	27	72	47	21	11
LIGHTING	**0**	**0.86**	**0**	**4**	**3.7**	**0**	**0**	**0**	**0**
Lamps	0	0.86	0	4	3.7	0	0	0	0
OTHER "FUNCTIONAL" CERAMICS	**0**	**0**	**0**	**2**	**0**	**0**	**2.12**	**0**	**9.09**
Loomweights	0	0	0	0	0	0	2.12	0	9.09
Drains	0	0	0	0	0	0	0	0	0
Unguentaria	0	0	0	2	0	0	2.12	0	0
Kiln spacers	0	0	0	0	0	0	0	0	0
Moulds	0	0	0	0	0	0	0	0	0
Tubuli	0	0	0	0	0	0	0	0	0
RESIDUALS	**0**	**3.87**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
UNCERTAIN	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

notionally attached, experienced a major restructuring in the Julio-Claudian period. The abandonment assemblage from this phase, as discussed above, contains mostly ovicaprids, pigs, and fowl, a diet of younger, succulent animals more adapted to roasting or braising. The ceramic assemblage, however, shifts only slightly, with a slight decrease in cooking pots (7%) and continuation of the same percentages of open forms, here both *tegami* and casseroles (6%). The overall ratio of open wares to closed cooking wares shifts from 10:4 to 7:3.

At Marzuolo Phase 1, a similar non-correspondence between younger animals and open form cooking vessels exists. Sheep/goat and pigs from these assemblages indicate a modest preference for younger animals, although subadults are also present (see Table 13.12). Cattle, present in significant numbers and presumably used for traction associated with the ceramic facility, also have a mixed age profile, suggesting not all were kept for hauling and plowing but also some younger animals for dietary use. Ceramic forms, however, are heavily dominated by cooking pots (12%) with very few *tegami* or casseroles (3%).

As indicated above, we had assumed that a that dietary preference for younger animals is reflective of a wealthier use-population. The fact that the cooking wares shift only slightly in response is significant. We have assumed that younger, more tender animals would be roasted and that these twin characteristics are privileged over older, tougher animals that would be boiled. In fact, as Corbier has noted, a variety of Roman literary texts seem to reserve the greatest admiration for techniques that preserved fat content, particularly stewing, and are dismissive of techniques like roasting that did not (Corbier 1989). Thus, the fact that a significant shift towards younger, more tender animals is not accompanied by a major cooking shift is a useful cautionary about what constituted "elite" cooking habits.

Tombarelle Phase 1, dated to the range 40–10 BC, provides more straightforward documentation for the relationship between animal age and cooking ware form. The cooking wares are almost divided between closed pots and open pans, including some *tegami* and *clibani* (portable ceramic mini-ovens used for baking). The faunal evidence was again dominated by younger animals and displayed an unusual species mix with 40% cattle, 30% deer, 10% wild boar, 10% sheep/goat, and 10% pig (Tables 13.11 and 13.12). Significant percentages of hunted animals are rare in central Italy and found mostly in elite sites (MacKinnon 2004:208). The butchery patterns showed a preference for large cuts: these would most likely be

	Podere Terrato	Marzuolo Phase 1	Marzuolo Phase 2	Marzuolo Phase 3	Tombarelle Phase 1	Tombarelle Phase 2	Tombarelle Phase 3	Overall Avg.	Avg. Late Republican/ Early imperial	Avg. 2nd–3rd c. AD	Avg. late antique
	102	730	3014	533	275	34	367				
	62	421	334	251	109	29	190				
	0	**2.85**	**0.29**	**5.17**	**0.91**	**3.44**	**0**	**1.33**	**1.04**	**4.435**	**0.29**
	0	2.85	0.29	5.17	0.91	3.44	0	1.35	1.06	4.435	0.29
	0	**2.13**	**0**	**0.39**	**0.91**	**0**	**1.05**	**1.11**	**1.48**	**0.195**	**0.35**
	0	0	0	0	0	0	0	0.70	1.02	0	0.00
	0	0	0	0	0.91	0	0	0.00	0.00	0	0.00
	0	0.47	0	0.39	0	0	0	0.31	0.42	0.195	0.00
	0	0.47	0	0	0	0	1.05	0.10	0.05	0	0.35
	0	0.23	0	0	0	0	0	0.01	0.02	0	0.00
	0	0.71	0	0	0	0	0	0.04	0.06	0	0.00
	0	**0**	**0**	**0**	**0**	**0**	**0**	**0.24**	**0.00**	**0**	**1.29**
	0	**0.23**	**0**	**0**	**0**	**0**	**0**	**0.01**	**0.02**	**0**	**0.00**

braised or roasted, seemingly on those large pans or *tegami*. Many bones showed evidence of spiral fracturing, indicating that a significant proportion were likely stewed, perhaps in keeping with a slight predominance of cooking pots.

To add to the complex relationship between meat and culinary practices, there is an overall shift away from the minority of open kitchen forms in the late Republic/early empire (13:8% MNI, respectively), towards an even greater dominance of closed forms in late antiquity (17:3% MNI) (Figs. 14.1 and 14.2). This shift is comprised both of a modest increase in cooking pots, a decline in cooking jugs, and marked decrease in open form casseroles and *tegami*. Very few (only 10 MNI) imported Hayes Tunisian casseroles were found in our sites (one of the wares commonly associated with this shift in open form vessels) of which only one of these was of 4th–5th c. date.

Paul Arthur (2007) has suggested that the trend of increasing sheep/goat consumption produced a concomitant increase in open-vessel cooking, as sheep/goat were cooked through evaporative means in open form vessels. His hypothesis is based largely on urban data from Naples and Rome in 5th through 6th c. contexts, but is supplemented by African and Sicilian sites, where he argues long traditions of sheep/goat dietary preferences helped produce the mass-marketed casseroles from Pantelleria and Tunisia that circulated throughout the Mediterranean in late antiquity. The continued importance of pork in Italy, particularly in in the central/northern regions, he believes led to either a continued use of closed forms or a mixture of open and closed forms.

Our data both support and complicate this model. Our region sits at the boundary of Arthur's proposed culinary shift—between southern and northern habits—and supports his hypothesis of a greater preponderance of closed vessels in these more northern areas. On the other hand, Arthur's data was focused largely on late antique contexts, rather than long-term trends. Our data point to an opposite trend—away from open vessels and towards closed—stretching over a long period from the 2nd through the 5th c. AD. This trend is matched by the same shift towards sheep and goat he sees as motivating the open form cooking practices. Contra Arthur, too, is the fact that the higher quantities of pig in earlier contexts are *not* matched by higher quantities of cooking pots, but rather a mixture of open and closed forms with closed still predominating. In short, our data show a general late Republican/early imperial preference for pork (always with significant quantities of sheep/goat and cattle) associated with a more mixed open/closed form culinary tradition, while the

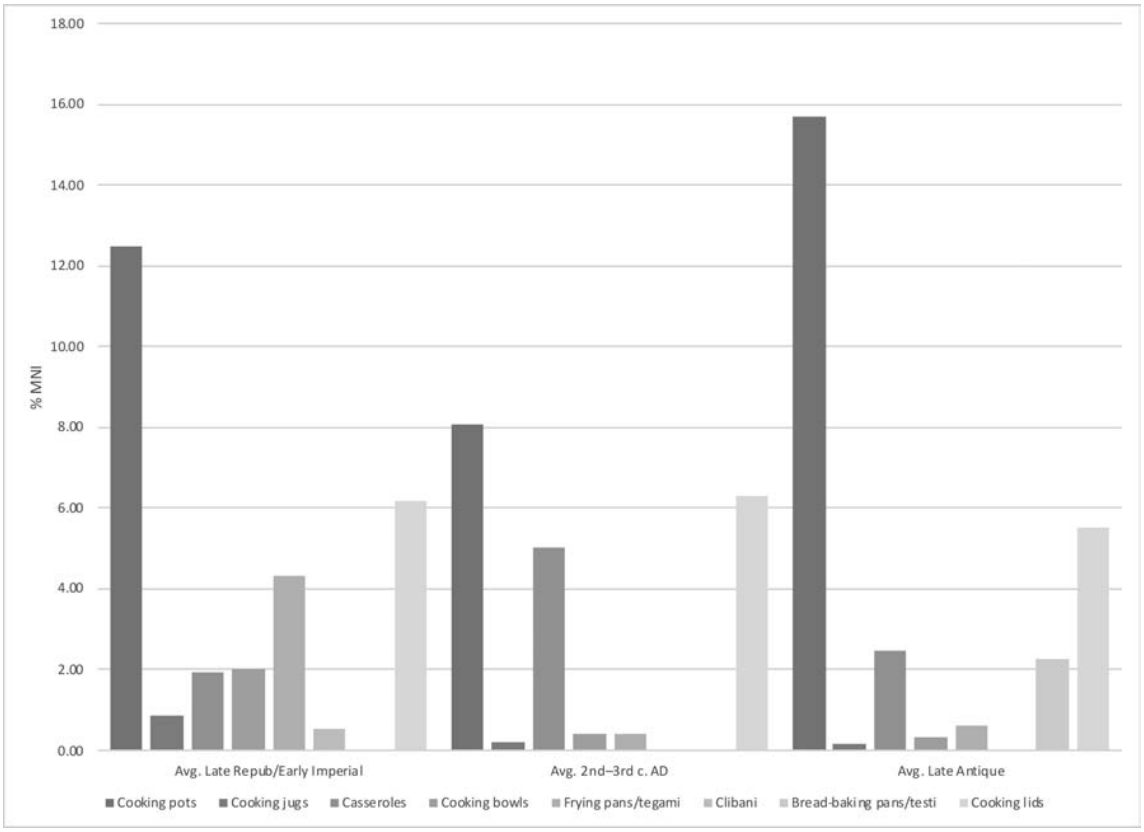


Fig. 14.1 Cooking ware forms, all sites, by period (average % MNI) (EV/KB).

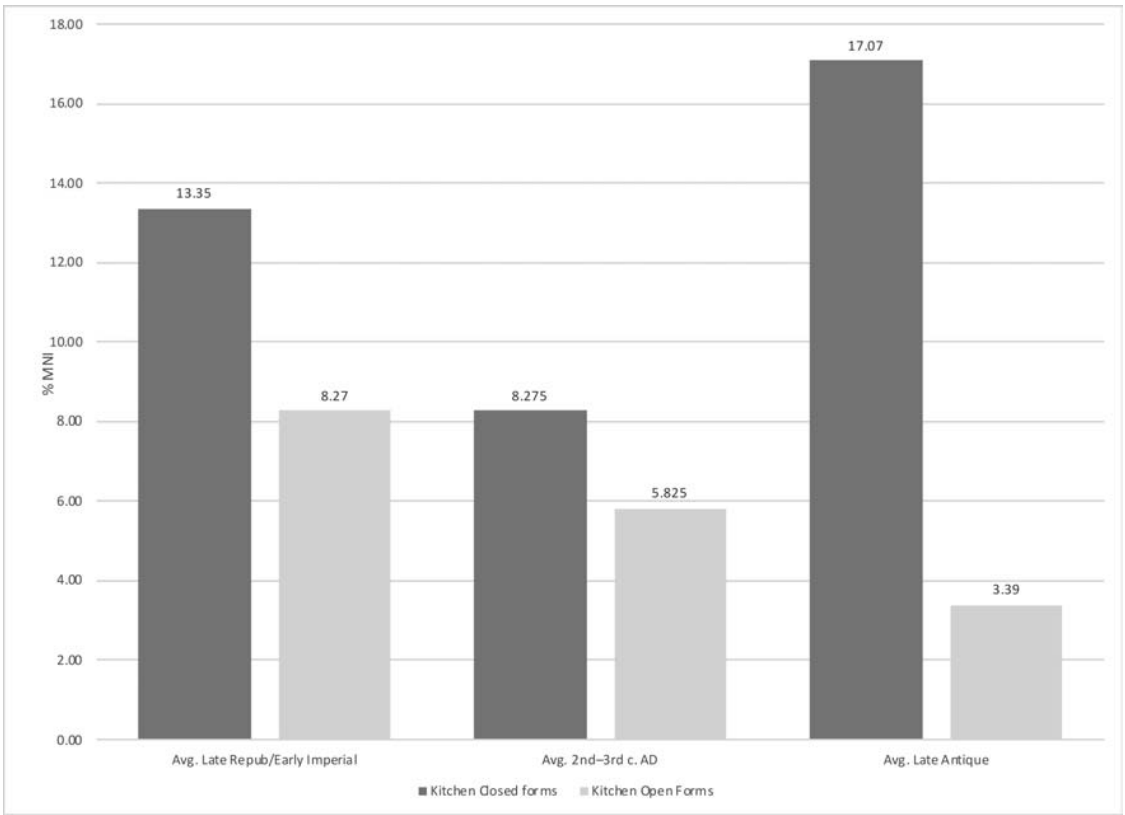


Fig. 14.2 Cooking ware forms, open versus closed forms, by period (average %MNI) (NB: bread baking wares [*clibani* and *testi*] excluded) (EV/KB).

shift towards sheep and goat is associated with the boiling/stewing practices of closed form vessels.

Given the paucity of quantified faunal and cooking pot assemblages from central Italy, it is impossible to say whether these trends represent a particular "peasant" habitus or are more broadly shared across wealth and urban/rural divides. No quantified cooking ware datasets could be identified to confirm or deny these trends for the earlier periods. Vaccaro's study of the later material has shown that closed form pots are more common in all 5th–6th c. rural areas in southern Tuscany, whereas at urban workshop contexts at Roselle, for instance, the 5th c. assemblages show a relatively higher percentage of open formed casseroles and pans (Vaccaro 2011:52–62, 93). In the late antique period, then, it seems to be geography rather than wealth that drives the trends in culinary practices.

14.4 Dining and Diet (KB, EV)

While cooking wares reveal something of cooking practice, tablewares are echoes of dining. While yet another step removed from the nitty gritty of what peasants ate, it speaks directly to the related question of *how* they ate (or drank). In Roman and other cultures, an increase in drinking vessels has been tied in some contexts with changes in feasting or alcohol consumption, shifts in plate size have been read as changes in individual versus communal dining habits, and, more tentatively, increasing diversity of forms has been associated with more complex diets (Brown 1997; Fuller 2005; Cool 2006; Pitts 2010).

The data from tablewares is abundant at almost every site in the project. Indeed, in most sites dining and dining/storage wares[3] comprise the bulk of the ceramic finds, ranging from 85 or 76% at Marzuolo or Tombarelle, with their admittedly skewed deposits, to 41 or 68% at San Martino or Poggio dell'Amore. Dining and dining/storage wares average 57% of all assemblages from all sites in the project and, while already dominant in the late Republic/early empire, actually increase as a percentage of the overall ceramic totals in late antiquity (Fig. 14.3). Many of these tablewares, except in the kiln dumps from Marzuolo, were in coarse ware or, particularly in late antiquity, local imitations of extra-regional fine wares. Underscoring this unexpected emphasis on tablewares in rural contexts is a new study on urban assemblages at Pompeii that show the opposite, namely relatively fewer tablewares and proportionately larger quantities of storage vessels (Ray 2017).

The most obvious and remarkable quality of this dataset is its extraordinary diversity: even the small sites on the sporadic end of the habitation spectrum exhibit a variety of tableware forms from jugs to cups and plates, present in both coarse and fine ware versions. At Poggio dell'Amore, for instance, five different forms of ceramic tableware were found including table jugs and jars, cups and dishes (see Table 14.1), as well as 4 MNI of glass in at least three different forms. At San Martino, also on the sporadic end of the spectrum, 12 different forms of ceramic tableware were present. As was discussed in Chapter 4, the rich late antique contexts from Pievina provided the opportunity to compare this diversity with that from urban contexts, namely the workshop contexts at Roselle. At Pievina, 22 distinct forms, of which eight or ten were distinct forms of tableware, were found in the abandonment and collapse contexts,[4] while at Roselle, 25 forms, of which 15 were tablewares, were found in the urban workshops (see Ch. 4: Tables 4.3 and 4.4). The small discrepancy is caused in part by the absence at Pievina of *sigillata chiara tarda dell'Italia centro-settentrionale,* present at Roselle in four forms.

This general level of tableware formal diversity can only with caution be associated with corresponding dietary diversity. As Bang has argued, supply in all Roman contexts, perhaps rural ones particularly, was subject to major fluctuations of supply and access, and diversity may simply be a product of shifting exchange networks, local workshop exigencies, and other factors having to do with supply (Bang 2008). It is also possible that the diverse tableware forms reflect differentiated steps or "moments" of food and beverage consumption—the difference between eating out the pot and the carefully orchestrated steps of a formal dinner. Separating cooking from serving from eating requires a variety of vessels forms, which may be reflected in our relatively diverse assemblages. Finally, different vessel shapes may be designed and used for different kinds of foods: bowls for semi-liquids like pulses or stews, open dishes for drier foods like vegetables, bread, fruit, or braised meat, jugs for wine decanting, cups for wine drinking, an so forth. Very little work has been done to tie Roman ceramic complexity with either dining habits or culinary

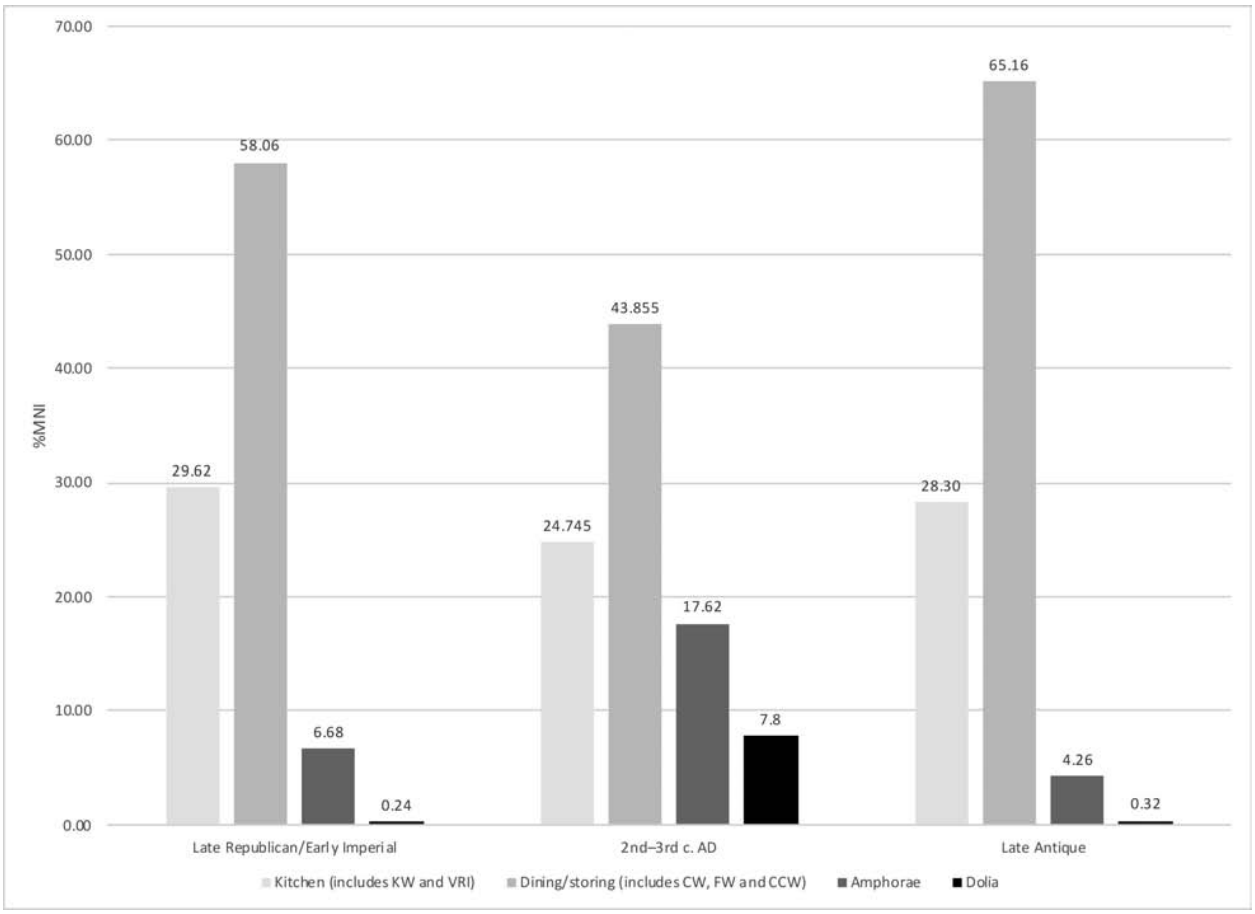


Fig. 14.3 Major ceramic forms, all sites, by period (average %MNI) (EV/KB).

complexity, but some studies, mostly on provincial materials, have tied increasing vessel diversity with the expansion of foods brought by the Roman conquest (Cool 2006:43).

While these features, a predominance of tableware and its formal diversity, characterize sites of all periods, there are significant temporal shifts in forms that may point to not only changing production and supply, but also shifting culinary traditions.

Looking specifically at the late Republican/early imperial contexts, the two most common forms are jugs and dishes (Fig. 14.4). The jugs are almost entirely in coarse ware, while the dishes are dominated by fine ware forms in Black glazed or Italic sigillata. Cups and bowls are next in frequency, mostly in fine ware classes. The data suggest a number of possible dining habits. First, the tables of late Republican/early empire peasants were slightly dominated by open form vessels (33% MNI of total assemblages) but also had a significant number of closed forms (21%) (Fig. 14.5). Taken together, this points to a near equal formal emphasis on beverages as on drier foods—both food and drink get more or less equal "space" at the table. The use of smaller-sized dishes, bowls, and cups points to individuals eating and drinking from their own cups and plates, rather than shared large platters (see below). The large number and forms of both jugs and cups indicate a practice of decanting liquids, presumably particularly wine, into intermediary sized vessels and then into cups.

The assemblages of the high empire are quite different in character, a fact that accounts for many formal changes (see Figs. 14.4 and 14.5). Only Marzuolo Area III preserved actual "domestic" contexts—the rest of this period's assemblages are deliberate fills and particularized abandonment contexts. The large quantity of amphorae, which then yield percentage-wise smaller quantities of table and cooking wares,

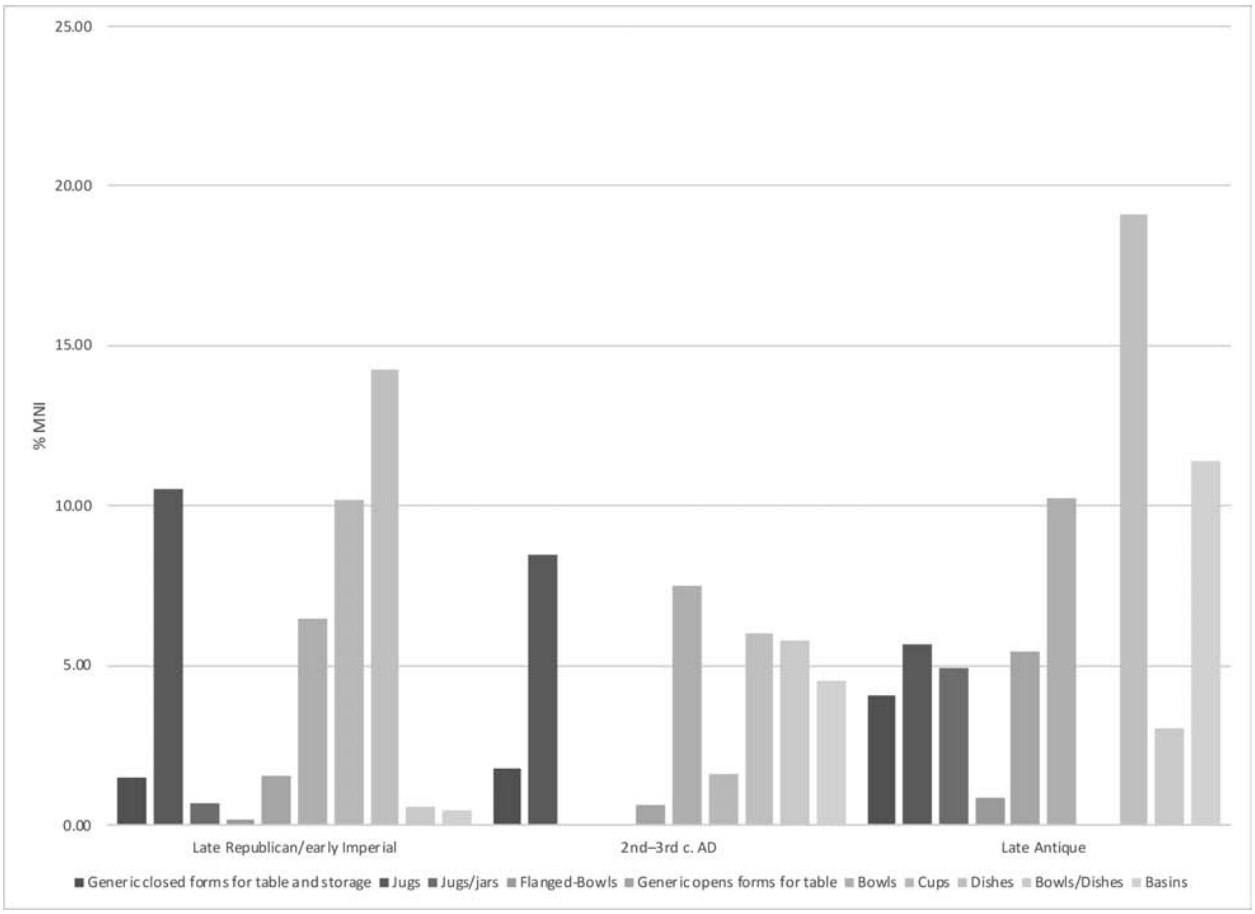


Fig. 14.4 Tableware forms, all sites, by period (average %MNI) (EV/KB).

are probably an artifact of context, not overall table practices. It may be significant, however, that quantities of both table jugs and dishes decline, as do cups, while bowls remain relatively more common.

Some of these trends continue into late antiquity, when tableware percentages remain high or even increase, yet their formal qualities are demonstrably different from those of the late Republic (see Figs. 14.3–14.5). Jugs, again mostly in coarse ware, decline dramatically but are replaced by more diverse closed serving forms, including a significant percentage of a jars. It is hard to know if this points to a shift in beverage serving practices or simply a formal shift from closed to more open-mouthed secondary containers. The use of jars, which might double as storage, might also suggest a lack of differentiation between storage and serving forms. Another shift in drinking practice is signaled by the disappearance of cups, which are not replaced by any similar form. The most significant shift, however, is in the expansion of open forms generally and dishes in particular. Some 19% of all late antique tablewares are open forms, dominated by dishes. These are often of large (25–30 cm diameter) size, including both a small number of African red slip forms like Hayes 61A and 67B, and the many imitations of these, and other open forms like bowls and basins in coarse ware, color-coated ware and *acroma depurata*. As has been suggested (Carandini 1981:15; Hudson 2010; cf. Durham and Hawthorne 1999), the shift to these larger dishes from the smaller dishes and bowls of the early empire, may point to a move away from individually based eating practices and towards shared, communal dining, with a small group either gathered around a shared plate or passed dishes from which individuals help themselves.

Again, the paucity of quantified assemblages that include not only fine ware forms but all tablewares, makes it difficult to know if these trends are shared

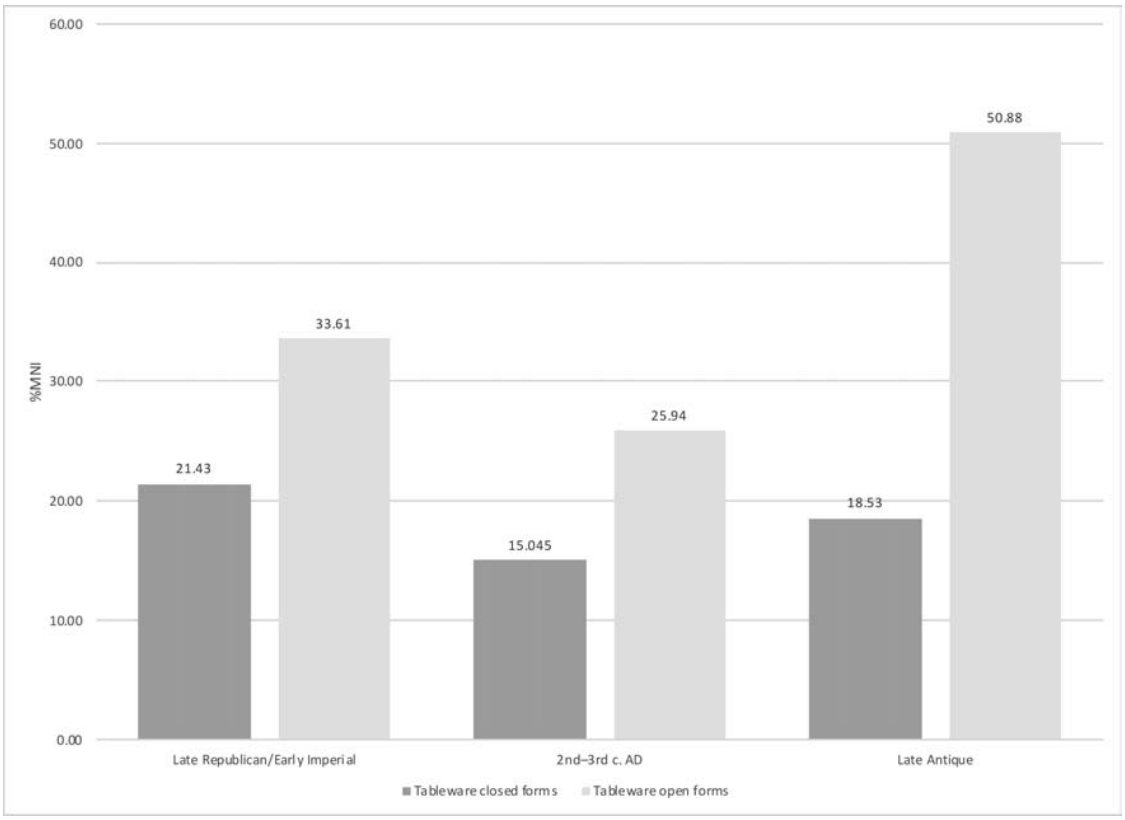


Fig. 14.5 Tableware forms, open versus closed forms, by period (average %MNI) (EV/KB).

and if so, how broadly. Analysis of the ceramics at the Tuscan rural site of Molino San Vincenzo demonstrates very similar trends, with dominance of jugs in the late Republican/early imperial contexts, and a shift to open form dishes in late antiquity (Veronika Schreck, pers. comm.). The wealth status of this site is seemingly somewhere between a luxury villa and a large farm, suggesting that at least one wealthier site might demonstrate similar broad trends. The shift to larger dishes in late antiquity from smaller, more individually oriented bowls and dishes in the early empire has been widely observed (see above), but not always quantitatively documented. When quantitative analysis is brought to bear, it has supported the broad trend, but noted equally important local variances evidenced from the culinary practices of local communities (e.g., Willet 2018). In this trend, at least, our peasants are participating in shifts in dining practices characteristic of the empire as a whole, but only further published assemblages will reveal to what degree these are locally inflected.

14.5 Subsistence, Surplus and Storage (KB)

Tied to the question of what peasants ate and how they ate it, is the equally vexed question of how much they had to eat. This problem of "how much" has been historically attached to the question of subsistence. For most scholars, the definition of "peasant" intersects in some way with the question of "subsistence." "Subsistence" agriculture is traditionally defined as production aimed at satisfying the needs of a family with little or no surplus for trade or storage. Subsistence farmers are thus assumed to make decisions principally with their eye on the coming year's needs, periodic harvest failure, and seed, with little consideration given to sale on the market. The subsistence farmer was often assumed to have little protection against lean years, the demands of taxation, or other factors that pushed a system aimed at producing enough to survive into perpetual cycles of want (Chayanov 1966; Wolf 1966;

Frayn 1979; Garnsey 1988; Gallant 1991; cf. Forbes and Foxhall 1995).

In the classical definitions of Chayanov and even for Wolf, the peasant was defined as a subsistence farmer, but what "subsistence" actually entailed received little scrutiny. The rejection of Chayanov's essentialized peasantry, an increased appreciation of the role of global economies in peasant's agricultural decisions, and a reexamination of modern and ancient data have all called into question both the traditional definition of "subsistence" and its application to many smallholders in different historical periods (Shanin 1980; Bernstein and Beyrs 2001). While many enthoarchaeologically based studies of Greek peasants have upheld a traditional model of peasant decision making and relative insulation from market interactions (Gallant 1991; Forbes 2007; Halstead 2014), many of these same studies have also drawn attention to the question of storage as a component of subsistence. These ethnographic studies have documented not only storage practices, but the major role storage and surplus production for storage played in peasant decision making (Forbes and Foxhall 1995; Halstead 2014). Cycles of drought, as well as the effect of these on market prices, led modern peasants in the Peloponnese to store a year's worth of grain and four years of oil as both insulation against famine and as possible commodities to sell if prices skyrocketed (Forbes and Foxhall 1995). Archaeological data on Roman peasants has documented similar strategies but has also emphasized storage's relationship with market production: Groot's work on Roman period peasant villages in the Germania Inferior have found ample granaries for human and animal fodder as well as animal byers (Groot et al. 2009). The capacity of these were calculated as exceeding the population's immediate requirements and, thus, indicating surplus production of both grain and animals for storage and market sale. This new work, then, has both suggested that the term "subsistence" needs revising as applied in specific historical circumstances, and that Roman peasant strategies may have included significant surplus production, both as a risk reduction strategy and for market sale.

The project's data further contributes to the revised definitions of "subsistence," although again mostly through secondary, qualitative data rather than direct quantitative evidence. The first set of data comes from information on agricultural production. As discussed in Chapter 13, the pollen evidence, as well as the sites themselves describe an intensive mixed agriculture. The sites, composed of both specialized work huts, animal shelters, pressing facilities combined with more permanent farms and "houses" describe an intensively managed landscape in which particular activities on particular land parcels were marked and made more efficient via permanent constructions. The pollen evidence reveals a pasture-heavy landscape where cereals and, to a lesser extent, olive and grapes, were grown near more permanent habitations, while pasture dominated near less permanent structures. The pollen evidence likewise produced possible evidence for the rotation of cereals, legumes, and pasture. In at least two cases field drains removed excess standing water from fields to prevent waterlogged soils and pathogens that might affect livestock. In sum, the data indicate a labor-intensive curation of the land in which large swaths of managed pasture prioritized animal husbandry while parcels of seed crops were managed with maximum efficiency through rotation at the same time the periodic use of that land for fodder crops likewise maximized animal production.

This evidence for intensive mixed agriculture points beyond traditionally defined "subsistence" practices towards something else. As we noted in Chapter 2, this area was not subject to particularly high population or other pressures that would have limited the available land. The management of even unlimited land intensively implies strategies aimed towards maximized production.

The abundant evidence adduced here for a mobile population, particularly in the late Republican/early empire, could likewise be read in the same way (see also Ch. 17). The specialized sites found by the project imply peasants moving from plot to plot in specific seasons or to manage particular assets. Given the heterogeneity of Tuscan (and Mediterranean) landscapes, a mobile approach would have allowed farmers to maximize a portfolio of small plots by relocating effort and animals appropriately. This would likewise reduce risk: rather than having all of one's investment in either a single plot or a variety of plots used one at a time, having the ability to move to and exploit multiple plots simultaneously reduces the risk attendant in single-plot systems. It has long been assumed that diversified holdings reduced ancient peasant risk in this way (Garnsey 1988:47–50; Gallant 1991:41–46; Forbes 2000a): the data from the project provide some physical evidence in support.

An integral part of these mobile strategies was the emphasis on animal husbandry as noted throughout. We have argued that multiple datasets point strongly towards integrated agriculture, which sees pastoral and seed crop strategies complementing one another. Animals act as on-the-hoof storage: carefully managed, they provide year-round caloric deposits that can be called upon for milk or meat at regular intervals. As described above, the pasture animal mix in the project area changes somewhat over time but consistently included pigs, sheep/goat, and cattle in small herds. The butchery and culling patterns (see above and Ch. 13) indicate that these herds were kept reasonably close to home and, in the case of sheep/goat and cattle, were managed principally for their milk/wool/traction and then eaten at the end of their work lives. Management of animal caloric deposits in this way not only provided more protein in the diet than has been supposed but also reduced risk.

What we cannot know is how successful those maximization strategies were towards producing surpluses. As noted above in Chapter 13, we are reluctant to enter into a largely assumptive quantification of crop yields. For similar reasons, we are equally reluctant to guess at the amount of land each family farmed (see Ch. 12). What we can say from the above discussion is that the ingredients existed for surpluses, either in crops or animals, and that all the data indicate maximizing strategies designed to make the most efficient use of extant land resources while minimizing risk.

The other, potentially more reliable, data for estimating surplus is storage. Studies of modern poor populations, both urban and rural, have highlighted storage, including food, cash, and other goods, as one of the most important aspects of wealth management (Collins et al. 2009). Storage represents both daily and longer-term strategies. Storage of water and foodstuffs are quotidian requirements in every household, while longer-term storage, which is usually larger in scale, preserves seeds for the next season or agricultural surplus for lean years or for the market. Animals act as both quotidian and longer-term storage. It is as representative of surplus and longer-term strategies that storage touches on the question of subsistence.

Data for storage from our project came in two principal forms—architecture and ceramics: a granary and cistern found in Phase 1 Pievina, a cistern found in phase 1 Tombarelle, and the evidence for dolia from most, although not all, sites.

The Pievina granary dates from the late Republican phase of the site. It, along with its cistern, tile kiln, hearth, and unexcavated remains to the E, lead us to identify the site as a farm. The building identified as the granary measured 12 x 5 m and was composed of two solid end walls between which ran two parallel rows of three piers (see Fig. 4.6). The piers are reconstructed as having born a raised floor, typical of most Roman granaries, which kept the stored crop above water and pests. As the area around the granary was heavily eroded by a later land slump, no botanical remains were recovered that might indicate what it held. Assuming the granary measured around 2.5 m in height, but that the grain would have been piled only 0.3–0.6 m high, as seems to have been in the case in early modern granaries (Blöck 2019), we calculated it could have held 14,130 to 28,260 kg of wheat, somewhat less for barley or other grains (see Ch. 4).

While very unlike the great *horrea* of cities, villas, and military sites, the Pievina granary contains the basic elements of such a structure, namely a raised floor. No granary of such petite size and farmstead location has been identified to date in Italy, where research has focused on villas (cf. Van Oyen 2015a), but the new large-scale work on peasant farms in the Netherlands, Gaul, and Britain has revealed hundreds of these small granaries, often built atop posts, but similarly modest in their scale and structure (Groot et al. 2009; Ferdière 2015; Salido Domínguez 2017; Martin 2019). Like at Pievina, these small granaries held the surplus grain of small farms and other settlements.

Estimates of the granaries capacities are always inexact and potentially misleading, largely because we are rarely certain what type of grain they held (Salido Domínguez 2017). Maximum and minimum capacities for the Pievina granary, assuming a majority wheat contents, range between 14,130 to 28,260 kg, depending on how high it was stacked.[5] This far exceeds the various assumptions about yearly grain needs of a family of 10 (cf. Groot et al. 2009: 326 kg/pp/y; Harris 2011: 250 kg/pp/y) plus a year's grain held in reserve. Alternatively, the granary could have supplied at a minimum capacity and maximum grain needs (Groot et al. 2009) some 20 people for a year plus a year's held in reserve. Since Pievina was the only farm we

excavated, we have no means of judging its storage capacities relative to others in the area, or to know if Pievina served as collection point for surplus in the locale. The capacity is small, however, when compared with granaries from central Italian villas (Van Oyen 2015a) or even a larger farm near Lucca whose granary measure 20 x 10 m (Ciampoltrini 2004). In short, this single example of a granary from what appears to be a relatively modest farm indicates that farmers in the area were producing a surplus and that that surplus could supply seed, lean year back-up food, and/or a product to be sold on the market.

The Pievina cistern, with a minimum capacity of 245,000 liters, would have held sufficient water for not only convenient domestic use, but above all for presumably nearby gardens (see Fig. 4.6). This quantity of water would have minimized loss during hot summer months, extending the growing cycle and improving yields. It had an additional virtue of siphoning off ground water seepage from that area, protecting the down-slope granary and other buildings from its effects. The function of the cistern at Tombarelle is more enigmatic: with a volume of ca. 49,500 liters, like the Pievina example it stood at the upper part of the slope and, thus, could be used for downslope irrigation (see Figs. 11.3–6). Its partially preserved vaulted cover, however, might suggest preservation for other uses, possibly ceramic production (cf. Quilici and Quilici Gigli 2009).

Van Oyen has drawn attention to the propensity of 1st c. BC elites to engage in "conspicuous production" by monumentalizing granaries, cisterns, and other storage spaces on their rural estates (Van Oyen 2015a). Elite mastery of nature's different products and of the different scales of time that storage implied are made manifest by moving what had been less visible buildings into larger scale, more visible settings. Pievina suggest that smallholders employed the same technologies, physical and rhetorical, but simply in smaller scale. While petite compared to their counterparts in elite villas, the cistern and granary at Pievina were likewise objects of conspicuous storage, making evident their proprietor's capacity to produce surplus, harness water, and deploy those goods at will. Like the data for dining wares and diet, they describe a peasant world participating in a shared Roman material vocabulary.

Somewhat more abundant is the evidence for smaller-scale storage in the form of dolia (see Table 14.1 and Fig. 14.3). Tiny quantities of dolia were found on project sites. Most were found either in sites on the more permanent end of the habitation spectrum (Pievina Phase 2, Marzuolo Phase 3) or from production contexts (Marzuolo Phase 1). The single exception is 1 MNI from San Martino. We did not undertake size analysis or volume reconstructions on this tiny corpus.

Dolia are the storage vessel of choice in the Roman world as their thick walls, often further protected by their placement in the ground, could keep out moisture and pests and were resistant to cracking and breakage. While the colossal grain dolia of urban sites like Pompeii and Ostia or somewhat smaller wine dolia of villas like Settefinestre are best known, dolia came in a wide variety of sizes and were employed for a whole range of quotidian storage uses. Either larger or smaller examples might be used for grain storage, wine fermentation, other storage, or even used to water animals. Dolia were often reused as structural material—witness the reuse of the dolia at Pievina as a hearth—and their broken walls could also double as construction material as seems to have been the case in the Case Nuove cistern (cf. Peña 2007). Thus, the dolia data from the project requires some parsing before analysis as not all dolia found on a site were being used as storage.

In general, then, the dolia are remarkable principally for their sparse quantities. Similarly, aside from the one granary, there was no other structural evidence of food storage, like the lower "sunken" floors common in early medieval houses that were likely used as storage spaces. While roof spaces and attics may also have been used for storage (Halstead 2014), the archaeological evidence was insufficient to indicate such spaces. Neither did we find the large-scale dolia found in Roman villas or even large underground storage pits (silos) that are common on early medieval villages (Vigil-Escalera Guirado, Bianchi, and Quirós 2013). In short, the project's evidence for large-scale, long-term storage is lacunose.

The principal reasons for this, again, is almost certainly the nature of the sites excavated. Large-scale storage represents large-scale time and most of the sites excavated by the project were occupied and/or used for only portions of the agricultural year. The one that occupies the "permanent" end of the scale, Pievina, was the only example that had large-scale long-term storage. Long-term storage would seem to

go hand in hand with long-term occupation, while more quotidian, smaller-scale storage could be found anywhere humans or animals spent time.

14.6 Conclusions (KB)

The project's contribution to the debated questions about peasant diet, nutrition, and subsistence are, in some senses, quite limited, as the excavations failed to produce the fruit and seed remains, human skeletal material, and large-scale storage apparatus that dominate the argument in archaeological circles today. These lacunae derived from deposition and preservation issues, the nature of the sites excavated, and, in some instances, because the evidence was simply missing. In partial compensation, the data provided more robust information on allied issues such as the nature of agriculture and use of the land, the habits of dining and cooking, and on everyday storage, which, while not answering the fundamental questions, provide something closer to the "thick descriptions" of peasant life we set out to provide.

The data described in the previous chapter set out the case for an intensive-extensive, integrated agricultural system that may have used sophisticated techniques for maximizing production of cereals and animal products. Very few traces of the surpluses presumably produced by those systems were found, in part due to the more sporadic nature of the sites excavated. The exception—a granary whose volume could have held significantly more than the attendant family needed—indicates that such surpluses were produced and held in the more permanent sites.

Dietary protein may have been more plentiful than Garnsey's originally pessimistic assessment. An integrated agricultural regime saw animals as a priority and small, closely managed herds would have provided daily milk and occasional meat. Plant protein from both protein-rich grains like barley, emmer, and farro, leguminous plants like lentils, as well as garden orache may likewise have contributed more to the diet than the common wheat assumed to be the peasant staple. Indeed, faunal assemblages from these peasant sites reveal long-term temporal shifts—a general increase in animal size through the empire and decrease in late antiquity, and a slow shift towards sheep/goat in late antiquity. Peasant meat consumption broadly tracks Roman habits generally.

The difference with elite diets may have been the variety of these foods, and, particularly in the case of meat consumption, the quality of the cuts in question and likely the quantity. Old, stringy animals eaten at the end of their use life differentiated at least some peasant sites from elite sites, which had both younger animals and more prime cuts. Older animals required stewing and boiling and the predominance of cooking pots over open forms in both the late Republican and late antique sites in the project may coincide with a higher incidence of older cattle and sheep in dietary protein from these periods.

Site-by-site variability, however, is as noteworthy as these larger trends. At one end, aspects such as selection of older taxa and a predominance of "poorer-quality" cuts from those animals (such as the case for Pievina) may suggest that some peasants had to content themselves with second-rate meats and portions. Other assemblages, such as those from Case Nuove and Marzuolo, suggest aspects of "higher-status" dining (i.e., younger animals, better-quality cuts, and greater variety, including more wild taxa). Similarly, cooking pot numbers do not track onto age patterns in any consistent way, pointing to culinary tradition trumping meat quality or to different cooking practices among different families.

Tablewares as proxies for both dining practices and dietary complexity pointed to a set of praxes that were broadly shared with the rest of central Italy. The peasant table was patently not set with a single plate or bowl. Even in the sites on the sporadic end of the habitation spectrum a wide variety of jugs, jars, plates, bowls, and cups were used for eating and drinking. Thus, while we had little evidence for dietary complexity, we had abundant evidence for complex table habits, particularly in the late Republic/early empire around vessels for beverages. In one case, we had quantitative data for comparison, this tableware complexity was similar to that of urban assemblage at Roselle. So, too, were broader changes in table habits—like the shift to large communal dishes in late antiquity—registered in peasant sites as they are in urban and elite sites. What differs in all phases is the scale and the fineness of wares: these peasant sites had fewer multiples of these forms than did elite homes and, more often than not, versions in coarse ware rather than fine ware.

In sum, taken together the evidence points to something beyond the cycles of want and traditional

"subsistence" farming argued by Garnsey and others and suggests a more robust world of greater productivity, dietary diversity and resilience, and better access to goods than imagined. At the same time, many elements of Garnsey's model are evident: a likely tendency to risk management and the small scale of everything from the number of sheep to cups at the table, a small scale that would subject its owners to the swings of fortune.

NOTES:

14.1 At Podere Falsettaio the landowner reported finding Etruscan cinerary urns in the 1950s. The only other cemeteries located by the survey were associated with the medieval church of Santa Marta.

14.2 Graves were located, but not excavated in and around the (medieval?) church at Marzuolo. Current excavations have uncovered early medieval human remains around the church at Santa Marta.

14.3 As noted in Chapter 2, the category "dining/storage" is formed of both traditional tableware forms, as well as coarse ware forms (above all closed forms like jugs and jars), which might have had both table and small-scale storage functions for liquids.

14.4 As per the discussion in Chapter 4, the comparison with Roselle material necessitated a somewhat different calculation of tableware forms, hence the discrepancy between ten forms in our project tabulation and eight in the Roselle comparison.

14.5 Using wheat conversion from Gentry (1976:25). Minimum assumes a height of 0.3, maximum of 0.6 m (Blöck 2019).

15

Non-Agricultural Production, Markets, and Trade

Kim Bowes, Emanuele Vaccaro, Stephen Collins-Elliott, and Cam Grey

From a historiographic perspective, this chapter continues many of the questions introduced in the previous one. Access to and participation in external markets are the antithesis of the subsistence-based definition of the peasantry. For an earlier generation of scholars, ancient subsistence farmers either could not or did not want to produce surpluses for sale on the market and, except in very limited conditions, regarded market-oriented production strategies as too risky (Chayanov 1966; Wolf 1966; Gallant 1991).

Finley's influential model of the Roman economy, while largely disinterested in the problem of peasants, framed peasant interactions with the market somewhat differently. His parasitical city-country model had peasants producing surplus for sale to the city, but in a one-way stream of money and goods that left the countryside and its peasants impoverished and under resourced (Finley 1999:123–150). Rural peasants could never be consumers in any significant way, and rural demand for consumer goods was, thus, negligible—money only left the system, it never circulated within.

Other work has challenged these models of a market-insulated peasant and a parasitic model of city and country. Keith Hopkins's (1980) "taxes and trade" model was highly influential in assigning the countryside major roles in a monetized economy driven by taxation. In an effort to meet tax demands imposed by new Roman authorities, he argued that peasants in the provinces of the empire were forced to increase production and yield surpluses for cash sale. This cash, required to pay taxes, flowed through the countryside and greased the wheels of ever larger scale trade and exchange, both local and long-distance. Hopkins's contribution was less an engagement with the minutiae of the data than it was an elegant theoretical model, as is demonstrated by his rather dismissive responses to critics who marshaled contradictory evidence in their responses to his argument (cf. Hopkins 1995–96). Further, in the present context, the absence of a money tax in Italy during the late Republic and early empire would seem to render his model of only limited utility (cf. Silver 2008). However, by linking taxes and rents together as complementary, potentially competing mechanisms for extracting surpluses from peasants, Hopkins's model at least countenances monetization in the Italian countryside as well. Moreover, and as we will explore further below, recent arguments in favor of market engagement by peasants have progressively chipped away at assumptions that cash- and kind-based economies could not coexist in rural contexts and that peasants were motivated principally by the imperative to avoid risk, and, therefore, did not seek to obtain money by producing goods for the market (cf. Ligt 1990, 1991, 1993; Silver 2008).

Slower to change has been the fundamental hierarchies inherent in a city-country binary. In place of a consumer city, more recent work has emphasized

the productive aspects of cities (Wilson 1990, 2002) and posited rural market intermediaries between city and country (Whittaker 1990). The connectedness of city and country are now stressed as part of conjoined systems or networks (Morley 1996, 2011; Ziche 2006; Erdkamp 2015; cf. Pitts 2015). Nonetheless, a strong urban-centered teleology in which cities, tacitly imagined as yardsticks of Roman civilization, are the drivers of trade and innovation and are still presumed to be the most important centers of consumption (Van Oyen 2015b). While Hopkins long ago recognized the potential importance of aggregate rural consumption (Hopkins 1980; Ligt 1990), the evidence for such consumption and its implications not only for an urban-centered economic history but also for the place of the peasantry in that history, have not yet been explored.

The project analyzed a range of materials to understand peasants' relationship with "markets," from coins and craft industries to imports and exports. Defining "markets" in this case was important: many if not most of the residues of daily activities could be the result of exchange—the sharing/renting of the few equids found in the project, the purchase of fine wares manufactured locally, even the drinking of Aegean wine. Most exchange is local, between locals, whatever the origins of the good in question, a fact often neglected in the current fascination with long-distance trade (Horden and Purcell 2000). Likewise, this same historiography focused on large scale exchange (large in terms of quantities or distances) has ignored the potentially sophisticated exchange mechanisms at small scale, the "portfolios of the poor" that so interest modern development economists (Collins et al. 2009). Thus, this examination of the data takes a multi-scalar approach looking at production and consumption, trade and exchange across a range of distances and quantities. Along the way it addresses some of Roman economic history's long-standing "truths" about peasant economies and offers revised models.

15.1 Money (SCE, KB)

Money can be a difficult subject to discuss for a variety of reasons, prone to misunderstandings about its basic function and definition. While money can be any object or token used for the purpose of facilitating exchange, in effect, cancelling a debt, coinage is most often associated *grosso modo* with money in the Roman world. That said, monetization, rendering things into monetary terms, refers simply to the conversion of an object into money. This applies generally in contemporary economics to striking coins or issuing banknotes, and the same definition has been applied to ancient Mediterranean economies (Reden 2010:18–34). This can tend to result in the conceptualization of a "pre-monetary" condition of society, when barter and gift exchange were the dominant form of settling debts (Reden 2010:63–64) and, more erroneously, into an evolutionary view of economic development in which societies proceed from barter, to exchange in *specie*, to the use of credit (Graeber 2011). Thus, places that lack coined money may be conceived of as backwards or "primitive," in comparison to the "sophisticated" monetized economies facilitated through coined money. Hopkins's description of the Roman economy follows in this tradition of economic thought (cf. Aarts 2005:8), which has its roots in Aristotle's explanation for and history of the development of currency out of less convenient barter systems (Aris. *Pol*. 1.1257a–b; Meikle1994).

Paying increased attention to the fundamental practice of credit-debt negotiations rather than emphasizing whether a society is "monetized" or "non-monetized" offers one way around the evolutionary view implicit in the concept of monetization (Aarts 2005:12–14), and this trend may be owed to long-standing anthropological interest in gifts and debt (Mauss 1924; Parry and Bloch 1989; Peebles 2010). By further decentering coinage from the picture as the sole means whereby exchanges were conducted, the Roman world is recognized to have utilized a variety of transactional mechanisms to facilitate its economic operations, often in the abstract (Harris 2006, 2008; Verboven 2009). This includes rural economies, which regularly reckoned debts in non-monetary terms (Ligt 1990:33).

Coinage is a highly visible artifact and a clear manifestation of a behavior of exchange (Kemmers and Myrberg 2011; Haselgrove and Krmnicek 2012). To be sure, there is still a tendency to equate coinage as the sole form of money possible in the ancient Mediterranean (Finley 1999), and to assert that the countryside is lacking or deficient in coinage or that circulation rates were lower than in urban centers (Crawford 1970; Hollander 2007:131), questions which depend on quantitative estimates of the

available evidence, an approach which has been met with skepticism in the past (Howgego 1992:2–4). Dissatisfaction with presupposing an urban-rural divide in the habits of coin-use can be noted (Aarts 2005:6), as more evidence is showing that coin use was a regular feature of the countryside (e.g., Ripollès et al. 2009). The search for mechanisms behind the flow of currency in regional analysis, whether in urban or rural contexts, has naturally been focused on the issuing authority, the Roman state. Hopkins's tax-and-trade description of the Roman economy treats taxation as the primary mechanism for the circulation of currency in rural areas, as crop surpluses were readily and easily converted to cash to pay tax. The presence of the Roman military, too, has been viewed as an important determinant of the rural cash supply, although recent work has shown that soldiers are less important as agents of spreading coined change than are cities and urban markets (Katsari 2008).

There are numerous factors at work beyond the supply-side production of coinage which determine their frequency in archaeological contexts. Aside from depositional and post-depositional processes which determine the makeup of archaeological assemblages (Ellis 2017), differences in the denominational value of coins have been considered a driving factor, insofar as lower-value coins are less likely to be picked back up than higher-value issues; random losses have tended be regarded as having little utility in arguments about the cash supply of the Roman world (Evans 2013). Even more importantly, however, are inflationary or deflationary changes in the value of currency over time relative to commodities (Greene 1986:54–57). Thus, the rate of use of coins in places is equally owed to the value instability that coinage possess at that time, whether through debasement of the precious metals associated with giving that coin value, as happened with silver issues in the 3rd century AD, or through the proliferation of a "fiat" currency, which had primarily the backing of the Roman state (Harl 2015). These issues are broadly debated by historians and numismatists in different contexts, urban and rural, Italian and provincial (cf. Dossey 2010, Hoyer 2018).

The project found 84 coins in its eight excavations of Roman sites (Table 15.1), 82 of Roman date. The incidence of these discoveries were highly skewed, as noted in Table 15.2: Pievina and Marzuolo produced almost all the coins and the majority came from the mid-late Roman contexts, Pievina 2 and Marzuolo 3. Podere Terrato, Case Nuove, and Tombarelle also produced small quantities of coins. Estimating the rate of use of coins at each site in the past over time, given coins that can be seen to have been random losses, is a solvable problem (Collins-Elliott 2019), but, here, coin counts can simply be normalized by the inverse of the total excavated area to diminish the effects of the intensity of fieldwork on the

Site	AE	Silvered AE	AR	Total Coin Finds
Pievina	34	1	1	36
Marzuolo	27	2	2	31
Case Nuove	9	0	0	9
Podere Terrato	5	0	0	5
Tombarelle	1	0	0	1
TOTALS	**76**	**3**	**3**	**82**

Table 15.1 Count of all coins recovered showing coin finds by site, by denomination, with post-antique coins excluded. Unlisted sites had no evidence of ancient coinage (SCE).

Site	AE	Silvered AE	AR	Total
Pievina	0.94	0.03	0.03	1
Marzuolo	0.87	0.06	0.06	1
Case Nuove	1	0	0	1
Podere Terrato	1	0	0	1
Tombarelle	1	0	0	1

Table 15.2 Relative proportion of all coins recovered by site, by denomination, with post-antique coins excluded. Unlisted sites had no evidence of ancient coinage (SCE).

collection of data, since at the high end Marzuolo was excavated to two seasons of excavation, with other sites much less (Table 15.3). Even after normalizing for the effects of differential intensities, Pievina 2 and Marzuolo 3 still emerge with higher densities of lost coinage.

Table 15.3 Length of excavation and average rate of recovery of coins by site (SCE).

Site	Weeks (*n*)	λ (*x*/*n*)
Pievina	4	9
Marzuolo	8	3.86
Case Nuove	4	2.25
Podere Terrato	3	1.67
Tombarelle	4	0.25
San Martino	2	0
Poggio dell'Amore	2	0
Colle Massari	2	0

The findspots of these coins and their relative quantities are judged to be representative of coin loss and recovery. It is significant, therefore, that the only coins found derived either from those sites on the more permanent end of the habitation spectrum or from production/processing sites. Coin use and/or loss was minimal on the less permanently occupied sites like the temporary work huts at San Martino and Poggio dell'Amore, and focused instead on either places like Pievina, where occupation was longer, or in places like Marzuolo and Case Nuove, which witnessed production activities. In the two latter cases, however, it is interesting that most of the coins came from late antique contexts when the principal production activity of ceramic manufacture or wine/oil making was finished, and occupation had turned to either more domestic activities (Marzuolo) or winnowing/threshing (Case Nuove). Podere Terrato, which lay somewhat in the middle of the habitation spectrum, stands out since it was occupied for only a short period, was not a production area, and, yet, produced a small cache of Augustan/Julio-Claudian coins.

The vast majority of coins (93%) were low-value bronze alloys. Exceptions were three silver denarii (two Republican issues of the early 1st c. BC [an Apollo/Roma issue and an Apollo/chariot] and one one of Galba), two silvered antoniniani, and a silvered bronze coin. Most coins exhibited significant wear, suggesting long use and circulation prior to their loss. Such a preponderance of low-value coins is common on rural sites (Ligt 1990), where silver or later gold coinage is rarely found. These coins are assumed to have been used for small-scale exchange or daily wage payments, rather than rent payments or other large expenditures. These assumptions seem to match our evidence, where coin losses cluster either in places where daily requirements could have been paid in coin or in places of production where sale of goods, payment of day-laborers, or other transactions might have used coinage.

It is important to note that our peasant sites are no different than wealthier rural sites in their preponderance of low-value coinage (Reece 1989). Villas likewise tend to produce mostly low-value coins, and, while no comprehensive studies of rural coin supply exist for Italy, our region's villas, Nomadelfia and Aiali, produced only tiny quantities of coins, four and three respectively, and with one exception mostly of low denomination bronze (De Benetti and Catalli 2013:263–265).

Taking this contextual variability as a given, the chronological patterns of coin loss are marked. Table 15.4 tracks coins by denomination and period at sites throughout the region. As has been long remarked, coin loss is heavily determined by coin value: low-value coins and debased coins tend to experience greater levels of loss than higher value coins, such that gold coins are almost never found in archaeological sites at all (Reece 1984; Greene 1986:56). Obvious from the above analysis is the dramatic difference in the amount of coins lost and presumably available for exchange in different periods. The Augustan/Julio-Claudian period, the late 2nd and 3rd c. when older coins were also in use; and the 4th to 5th c. were the three major periods of coin loss among our project sites. The exception is Podere Terrato, whose short period of occupation meant it had only 1st c. BC/AD issues.

In part, these patterns reflect the dating of the sites we excavated. Given the important caveats of the decrease in coin finds in the later 1st c. AD and the smaller quantity of finds, the trends of coin loss more or less echo that for Italy generally (Reece 2016) and, with some exceptions, for our region specifically (Cuglia and Williams 2007) (Fig. 15.1).[1] Two major

Table 15.4 Regional coin finds by period. Periods defined by Reece (2016). Project sites in bold (SCE).

	Settefinestre	Roselle	Scoglietto	**Podere Terrato**	**Pievina**	**Case Nuove**	**Marzuolo**
"3rd–2nd c. BC"	8	83	2	**N/A**	**1**	**N/A**	**1**
"1st c. BC"	2	11	2	**N/A**	**1**	**N/A**	**2**
"Triumviral"	6	N/A	3	**N/A**	**N/A**	**N/A**	**1**
"27 BC–14"	10	19	4	**2**	**N/A**	**1**	**4**
"14–41"	5	19	2	**2**	**1**	**N/A**	**3**
"41–54"	4	7	N/A	**1**	**1**	**N/A**	**4**
"54–69"	2	13	N/A	**N/A**	**N/A**	**N/A**	**1**
"69–96"	27	16	2	**N/A**	**N/A**	**N/A**	**1**
"96–117"	23	7	N/A	**N/A**	**N/A**	**N/A**	**N/A**
"117–138"	18	16	1	**N/A**	**N/A**	**N/A**	**1**
"138–161"	8	20	4	**N/A**	**1**	**N/A**	**1**
"161–180"	2	17	2	**N/A**	**1**	**N/A**	**N/A**
"180–192"	N/A	7	1	**N/A**	**N/A**	**N/A**	**N/A**
"193–222"	N/A	10	N/A	**N/A**	**N/A**	**N/A**	**N/A**
"222–238"	N/A	7	N/A	**N/A**	**N/A**	**N/A**	**3**
"238–259"	N/A	23	1	**N/A**	**N/A**	**N/A**	**1**
"259–275"	N/A	43	7	**N/A**	**1**	**N/A**	**3**
"275–294"	1	14	13	**N/A**	**1**	**N/A**	**1**
"294–317"	1	18	3	**N/A**	**1**	**N/A**	**4**
"317–330"	N/A	5	3	**N/A**	**N/A**	**N/A**	**N/A**
"330–348"	N/A	11	11	**N/A**	**3**	**N/A**	**N/A**
"348–364"	1	17	16	**N/A**	**3**	**N/A**	**N/A**
"364–378"	N/A	4	19	**N/A**	**N/A**	**N/A**	**N/A**
"378–388"	N/A	7	N/A	**N/A**	**1**	**1**	**N/A**
"388–402"	N/A	N/A	N/A	**N/A**	**1**	**N/A**	**N/A**

Only datable issues are included. Coins whose date might span more than one of Reece's periods have been entered into the initial bin only.

trends, the decrease after the Julio-Claudian period as well as the increase in coin loss during the 3rd c., are both present here, despite the very ephemeral nature of habitation from this period. Aside from the short-lived Podere Terrato, the major exception would seem to be the 4th and 5th c., a time when Reece's estimates suggested coin loss in Italy seemed to decline generally, but when our sites, and those in our region, show a significant spike (see also Cuglia and Williams 2007). There are a couple of possible reasons for this. Reece's coin find estimates were drawn largely from museum collections: the tiny, poorly preserved bronze coins that comprise the majority of our late 4th–5th c. finds are less likely objects of museum collection and were often missed in earlier excavations—one of the possible reasons that Roselle and Cosa yielded few coins from this period although they had important contemporary settlement phases (cf. Cuglia and Williams 2007; De Benetti and Catalli 2013; and Ch. 4 in this volume). Indeed, other studies

have noted a significant expansion of post-Diocletianic low-value issues in all kinds of sites, as devaluation yielded expanded supply and circulation (cf. Burnett 1987; Depeyrot 1992) and new work, more attentive to these phases, is uncovering significant quantities of 5th c. issues in urban and some rural sites throughout central Italy (Arslan 2009:987–992; Baldassarri 2011). Thus, with the exception of the late 1st to early 2nd c. coin loss and perhaps coin supply to our peasants, the observed data seem to echo most central Italian patterns.

In general, the data from the project provides a number of useful indications. The first is the rather obvious observation that peasants used coins for small-scale transactions throughout the project area and throughout its Roman history. This was patently *not* a moneyless world. Furthermore, the loss of coins, insofar as we can judge from our data, generally reflected trends throughout Italy.

However, money was unlikely to be the only means of exchange. While it is impossible to recover positive traces of non-monied exchange, we can say that the equids found at Pievina or Marzuolo or their equipage could not have been purchased with the coins we found in those sites/phases. Barter, gifts, loans, and other kinds of exchange doubtless took place and, given the general absence of high-value coins or large quantities of lower value ones in many phases of our sites, these kinds of moneyless exchanges must have been extremely common. We should not view this, as noted above, as evidence of primitive economic behavior: the Smithian notion that barter constituted a "pre-monetary" form of exchange has been widely disproven and, given that some $12–14 billion of the modern US economy is estimated to consist of reciprocal or intra-household exchange (Temin 2001), the equation of primitive economies with barter is obviously erroneous. The mix of money, gifts, loans, and in-kind exchanges that probably characterized exchanges in the project area was almost certainly normal to the Roman world generally (Temin 2001; Bang 2008), while the quantity of coined exchanges versus other kinds of exchanges may have been lesser than it was in cities (Ligt 1990; Hollander 2007:122–135).

The RPP also produced some valuable data on where moneyed exchange did and did not take place. The places where people spent longest or where goods were produced were the most frequent sites of coined exchange. Coined exchange or at least coin loss is absent in temporary workspace sites like San Martino and Poggio dell'Amore despite a relatively diverse and sophisticated ceramic profile. Either the denizens of these sites exhibited particular care with their coins, or coins were simply rarely or never present on these sites because they were occupied only infrequently and/or their functions did not include moments of coined exchange. In this context, the absence of coins in Phases 1.1 and 1.2 at Case Nuove is particularly revealing: we have hypothesized that this site served as a collective press site where nearby peasants shared pressing facilities for both grapes and olives. Seemingly, that collective use did not involve coined payment, but was either entirely free or payment for use of the presses was made in kind, i.e., through a proportion of the final wine or oil. Contemporary presses in central Italy operate on similar principals where crops are pressed either through payment or most often in exchange for a percentage of the final product.

Findspots for coins indicate two distinct kinds of places where coins were used for low-value exchange. Pievina Phases 1 and 2, Podere Terrato, and Marzuolo Phase 3 are sites on the longer-term end of the habitation spectrum where monied exchange took place, likely the purchase of everyday consumer items—ceramics, glass, small-scale foodstuffs, tools, etc. At Marzuolo Phases 1–2 and Case Nuove Phase 2—both production/processing sites—monied exchange was perhaps mostly used for the sale of goods (ceramics at Marzuolo), or services (at the Case Nuove threshing site). It is interesting to note the shift in the latter site, where collective processing in the late Republican period seems have taken place either for free or via barter for the wine/oil processed, while in the later empire, not only the product changes (to wheat) but the fee for service seems to be in coin rather than kind. This shift may be in keeping with a general trend in this period to require cash payment for all kinds of services (cf. Kelly 2004).

15.2 Production and Consumption inside the Locale (KB, EV)

Roman peasants have often been assumed to have lived their economic lives locally, not only tending towards autarky but also, when forced to obtain outside goods, to have done so from local sources,

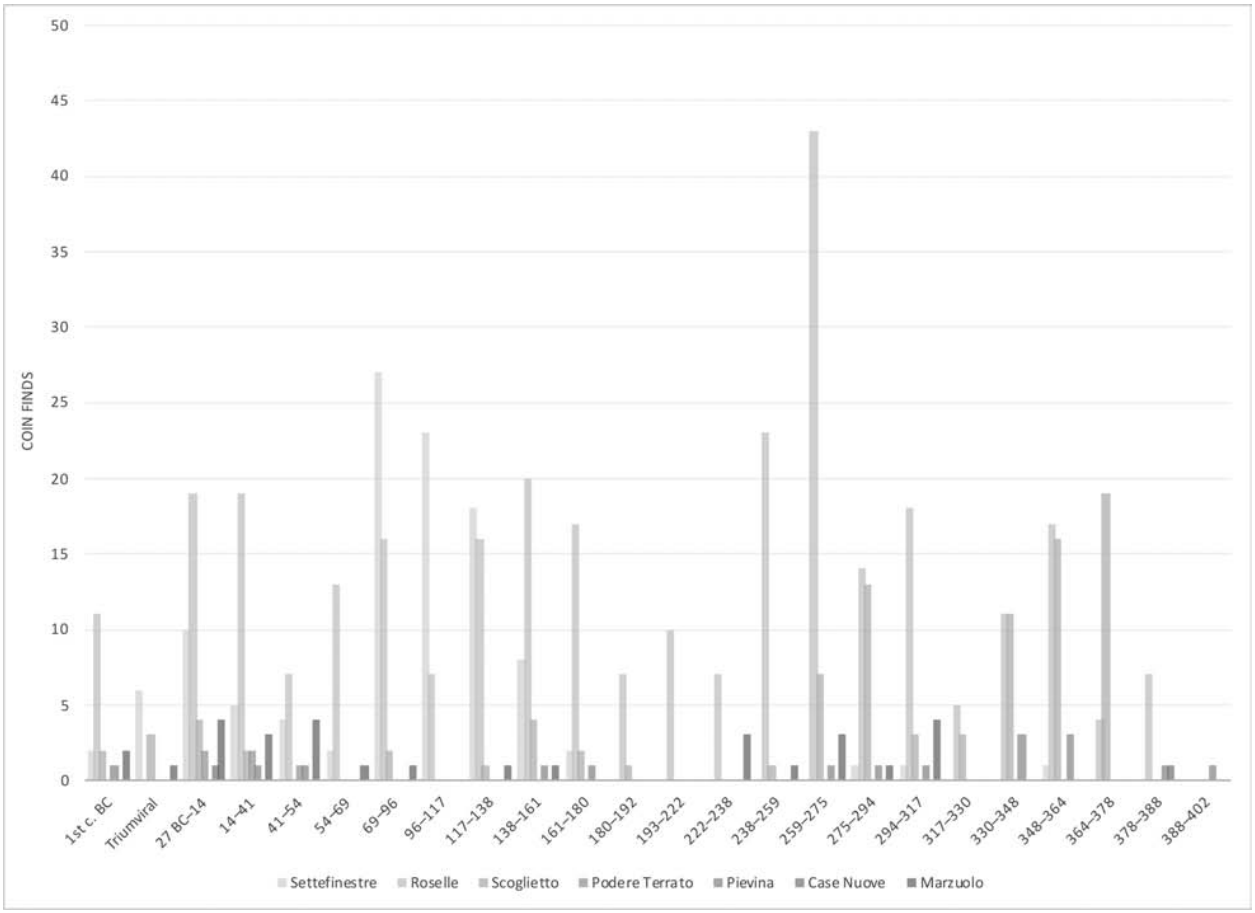


Fig. 15.1 Regional coin finds by period.(SCE).

either periodic markets (*nundinae*) or villages (Whittaker 1990; Ligt 1993).

The project's data reinforces the importance of the local but suggests a somewhat different model of both rural production and rural consumption than current scholarship has indicated. First, analysis of the project's ceramics shows that almost all wares were made locally or regionally, although almost all sites also have tiny quantities of imports from outside central Italy and this percentage increases over time. Comparisons with local villas indicate that both wealthy and poor rural inhabitants alike mostly produced or bought locally or near-locally manufactured products: peasants are no different in this respect from wealthy villa owners. Second, tracking the range of goods manufactured locally, from wine to roof tiles, permits a more complex understanding of "local," which extends beyond autarky to include brisk exchanges in secondary products. The project's data from the Marzuolo ceramic factory allowed us to track both production and consumption of one product, Roman fine ware, in the locale and tentatively indicate that even major fine ware production was oriented in part towards local rural consumers. Finally, we examine the extraordinary range and quantities of imported goods found in all sites in the project.

15.2.1 Origins of Goods: Imports and the Local

Tables 15.5 and 15.6 present the origin location of ceramics from the project—local/regional, extra-regional Italian, and extra-Italian Mediterranean. The former is defined as productions principally from the locale and Etruria, although the occasional example from further south or the Tiber Valley is included. Extra-regional includes principally material from Campania, while Mediterranean imports derive from the whole of the empire. The results are further divided by the three principal periods for which we had data: the late Republican/early imperial, the 2nd–3rd c., and late antiquity. Tables 15.7 and 15.8 break down the origin location for all extra-regional imports.

Table 15.5 Origin analysis of project ceramics, individual sites, by % MNI (EV/KB).

	Local/regional up to central Tyrrhenian	Extra-regional	Mediterranean	Uncertain
PERIOD 1: late 2nd BC to late 1st AD				
Pievina Phase 1 (159 diagnostics/30 MNI)	29 (96.66%)	1 (3.34%)	0	0
Case Nuove Phase 1.1 (117 diagnostics/45 MNI)	43 (95.55%)	1 (2.22%)	1 (2.22%)	0
Case Nuove Phase 1.2 (174 diagnostics/50 MNI)	47 (94%)	0	3 (6%)	0
San Martino (85 diagnostics/47 MNI)	47 (100%)	0	0	0
Podere Terrato (102 diagnostics/62 MNI)	60 (96.77%)	1 (1.61%)	1 (1.61%)	0
Poggio dell'Amore (41 diagnostics/21 MNI)	21 (100%)	0	0	0
Colle Massari Romano (13 diagnostics/11 MNI)	11 (100%)	0	0	0
Marzuolo Phase 1 (730 diagnostics/421 MNI)	418 (99.28%)	2 (0.47%)	1 (0.23%)	0
Marzuolo Phase 2 (3014 diagnostics/334 MNI)	316 (94.61%)	1 (0.29%)	16 (4.79%)	1 (0.29%)
Tombarelle Phase 1 (257 diagnostics/109 MNI)	107 (98.16%)	0	2 (1.83%)	0
Tombarelle Phase 2 (34 diagnostics/29 MNI)	34 (100%)	0	0	0
PERIOD 2: late 1st to 3rd AD				
Case Nuove Phase 1.3 (92 diagnostics/27 MNI)	22 (81.48%)	0	5 (18.51%)	0
Marzuolo Phase 3 (533 diagnostics/251 MNI)	190 (75.69%)	0	59 (23.74%)	2 (0.79%)
PERIOD 3: late 4th to late 5th AD				
Pievina Phases 2.1 and 2.2 (310 diagnostics/232 MNI)	207 (89.22%)	0	25 (10.77%)	0
Case Nuove Phase 2 (190 diagnostics/72 MNI)	69 (95.83%)	0	3 (4.16%)	0
Tombarelle Phase 3 (367 diagnostics/190 MNI)	189 (99.47%)	0	1 (0.52%)	0

Table 15.6 Origin analysis of project ceramics, project averages, by % MNI (EV/KB).

Period	Project Avg., All Sites (% MNI)
PERIOD 1: late 2nd BC to late 1st AD	
Local/regional up to central Tyrrhenian	97.72
Extra-regional	0.72
Mediterranean	1.52
Uncertain	0.03
PERIOD 2: late 1st to 3rd AD	
Local/regional up to central Tyrrhenian	78.58
Extra-regional	0.00
Mediterranean	21.13
Uncertain	0.40
PERIOD 3: late 4th to late 5th AD	
Local/regional up to central Tyrrhenian	94.84
Extra-regiona	0
Mediterranean	5.15
Uncertain	0

The data show clearly that most ceramics used by our peasants (75–100%) were of local or regional manufacture. However, there is some variation by site and more significant variation by period.

In the first period, very few extra-regional goods are consumed on our sites, including Black glaze and Italic sigillata fine wares, which are likewise made locally/regionally. Wine circulates either in local/regional Dressel amphorae or the newly discovered local amphorae found at Marzuolo and Tombarelle (see below). The exceptions to this emphasis on local goods are all amphorae: the occasional Campanian or Van der Werff Tunisian wine amphora or even rarer specimen of Baetican fish sauce (garum) amphorae. It is noteworthy that the only exception to this overwhelming dominance of local/regional goods is Marzuolo during its major Italic sigillata production phase, and its concomitant function as an exchange point (see Ch. 10).

The 2nd to 3rd c. witnesses an increase in extra-regional and Mediterranean goods, again from amphora-born food products as well now from fine wares. This increase is partially driven by the larger percentage of amphorae in the overall assemblages from this period. Only two sites, Case Nuove Phase 1.3 and Marzuolo Phase 3, yielded data, but those assemblages all had important quantities of amphorae, including imported varieties. Baetican and Portuguese fish-sauce amphorae dominate the imports, with smaller quantities of fish sauce from North Africa, and the occasional wine amphora from southern France and the Aegean. African red slip appears for the first time at Marzuolo and accounts for the majority of Tunisian imports from this phase. The presence of a few MNI of Tunisian cooking wares suggests these might have traveled alongside tablewares. Four MNI of lamps from the Padana represent northern Italian products.

The 4th to 5th c. sees a slight tail-off of extra-regional imports, but still an increase compared to the late Republic/early empire. As with the previous phase, imports are amphorae-borne foods, African red slip fine wares, and Tunisian cooking wares. Pievina, Case Nuove, and a single find from Tombarelle comprise the dataset. Tunisian African red slip wares account for most of the Tunisian imports. It is important to note the presence of local imitations of ARS in the form of color-coated and *acroma depurata* wares, and the continued presence of local wine amphora. Lusitanian fish sauce and eastern Mediterranean wine/oil amphorae are present in tiny quantities.

A word on fine wares is in order here, as fine wares are often supposed to be an index of a site's connection to markets or general wealth and status. Figure 15.2 shows the major ceramic classes from all sites, grouped by period. Fine wares for late Republican/early imperial contexts include black glaze ware, Italic sigillata, thin wall ware, and Experimental sigillata; 2nd–3rd c. contexts include African red slip ware, color-coated ware; *sigillata chiara tarda*, and late Italic sigillata; while late antique contexts include African red slip, color-coated ware, *sigillata chiara tarda*, and late Italic sigillata. Fine wares comprise 35% of late Republican/early imperial ceramics, there is a dip in the high empire, and then fine wares increase to 42% of late antique ceramics. Coarse or kitchen wares are the next most numerous class, with amphorae at significant lower quantities and dolia very scarce. As discussed in Chapter 12 (see Fig. 12.13), there is little difference in ceramic classes

Table 15.7 Extra-regional origin analysis of project ceramics, individual sites, by % MNI (EV/KB).

PERIOD 1: late 2nd BC to late 1st c. AD	Pievina Phase 1[a]	Case Nuove Phase 1.1[b]	Case Nuove Phase 1.2[c]	San Martino[d]	Podere Terrato[e]	Poggio dell'Amore[f]	Colle Massari Romano[g]	Marzuolo Phase 1[h]	Marzuolo Phase 2[i]	Tombarelle Phase 1[j]	Tombarelle Phase 2[k]
Campania	1 (3.34%)	1 (2.22%)	0	0	1 (1.61%)	0	0	2 (0.47%)	1 (0.29%)	0	0
Tunisia	0	1 (2.22%)	0	0	0	0	0	0	0	1 (0.91%)	0
Baetica	0	0	0	0	1 (1.61%)	0	0	1 (0.23%)	3 (0.88%)	1 (0.91%)	0
Tarraconensis	0	0	1 (2%)	0	0	0	0	0	0	0	0
Generic Spain	0	0	0	0	0	0	0	0	1 (0.29%)	0	0
Gaul	0	0	2 (4%)	0	0	0	0	0	0	0	0
Aegean/ Eastern Mediterranean	0	0	0	0	0	0	0	0	12 (3.59%)	0	0
Uncertain	0	0	0	0	0	0	0	0	1 (0.29%)	0	0

[a] 159 diagnostics/30MNI [d] 85 diagnostics/47 MNI [g] 13 diagnostics/11 MNI) [j] 257 diagnostics/109 MNI

[b] 117 diagnostics/45 MNI [e] 102 diagnostics/62 MNI [h] 730 diagnostics/421 MNI [k] 34 diagnostics/29 MNI

[c] 174 diagnostics/50 MNI) [f] 41 diagnostics/21 MNI [i] 3014 diagnostics/334 MNI

PERIOD 2: late 1st to 3rd AD	Case Nuove Phase 1.3 (92 diagnostics/27 MNI)	Marzuolo Phase 3 (533 diagnostics/251 MNI)
Tunisia	1 (3.7%)	26 (10.35%)
Baetica	2 (7.4%)	17 (6.77%)
Lusitania	0	4 (1.59%)
Gaul	1 (3.7%)	1 (0.29%)
Mauretania	0	1 (0.29%)
Tripolitania	0	1 (0.29%)
Northern Italy (Padanian area)	0	4 (1.59%)
Aegean/Eastern Mediterranean	1 (3.7%)	5 (1.99%)
Uncertain	0	2 (0.79%)

PERIOD 3: late 4th to late 5th c. AD	Pievina Phases 2.1 and 2.2 (310 diagnostics/232 MNI)	Case Nuove Phase 2 (190 diagnostics/72 MNI)	Tombarelle Phase 3 (367 diagnostics/190 MNI)
Tunisia	22 (9.48%)	3 (4.16%)	0
Lusitania	2 (0.86%)	0	0
Aegean/Eastern Mediterranean	1 (0.43%)	0	1 (0.52%)

Table 15.8 Extra-regional origin analysis of project ceramics, project averages, by % MNI (EV/ KB).

Period	Project Avg., All Sites (% MNI)
PERIOD 1: late 2nd BC to late 1st AD	
Campania	0.72
Tunisia	0.28
Baetica	0.33
Tarraconensis	0.18
Generic Spain	0.03
Gaul	0.36
Aegean/Eastern Mediterranean	0.33
Uncertain	0.03
PERIOD 2: late 1st to 3rd AD	
Tunisia	7.03
Baetica	7.09
Lusitania	0.80
Gaul	2.00
Mauretania	0.15
Tripolitania	0.15
Northern Italy (Padanian area)	0.80
Aegean/Eastern Mediterranean	2.85
Uncertain	0.40
PERIOD 3: late 4th to late 5th AD	
Tunisia	4.55
Lusitania	0.29
Aegean/Eastern Mediterranean	0.32

across the spectrum of habitation, and, in each period, fine wares constitute the most abundant class of ware. Thus, were fine wares regarded as some kind of marker of wealth or connectivity, these peasant sites would score quite high. The fact that most of these fine wares, particularly the Marzuolo Italic sigillatas and the color-coated wares that dominate the late antique fine ware corpus, are manufactured locally or regionally, should caution against preferencing fine ware as an index of trade connections or economic integration: the massive expansion of fine ware availability in the late Republic meant that fine wares were very often, as they are here, locally made. While they may have been harder to make, of higher aesthetic quality, and may, as discussed in Chapter 14, form part of complex table habitus, we should be wary of using them as indicators of extra-regional connectivity or urban/rural integration (cf. Van Oyen 2015b).

A few other categories of objects were probably also imported into the locale. Window glass from Pievina and Marzuolo, and vessel glass found at most of the other sites in the locale most likely came from the major production sites in the eastern Mediterranean. The boom in glass production in the 1st c. BC to 1st c. AD that supplied sites across the Mediterranean also reached this locale: with the exception of San Martino and Colle Masari Romano, all sites had at least some vessel glass, and finds at Pievina, Case Nuove, and Marzuolo were particularly rich (Tables 15.9 and 15.10). The majority of glass fragments were unattributable body shards, identifiable forms were principally drinking glasses, and secondarily bowls and closed forms like jugs, bottles, and pitchers. Interestingly, balsamaria (or unguentaria), a very common form of glassware in the Roman world, are rare and found only at Marzuolo.

In general, the overall patterns of glass use in the RPP appear to follow those of Italy at large, where cast vessels were available form the 3rd and 2nd c. BC onward, but where glassware became more common only from the first few decades AD in the form of free-blown and mold-blown vessels. Color schemes as well track with those for Italy, where light green, blue green, sky blue vessels appear to be more common in the 1st c. AD, while colorless vessels are more common in late antiquity. The forms found in the project sites with their emphasis on table and serving wares, were, however, quite distinct from an urban center like Pompeii, where glass storage forms (bottles, jars, and vases) predominated (Ray 2017).

This general pattern in the ubiquity of glass vessels can be nuanced. In general, beakers become widespread only in late antique contexts, while bowls or cups are more abundant in the 1st c. AD. In terms of the diversity and composition of the assemblage, the site of Marzuolo stands out for having the greatest variety, but also evidence of irregular glass flows and a cobalt blue bead, which is suggestive of glassworking at the site. Chronologically, the site possesses what is potentially the earliest evidence of glass use in the region (a fragment of a cast *millefiori* bowl, which could have been produced in the 1st c.

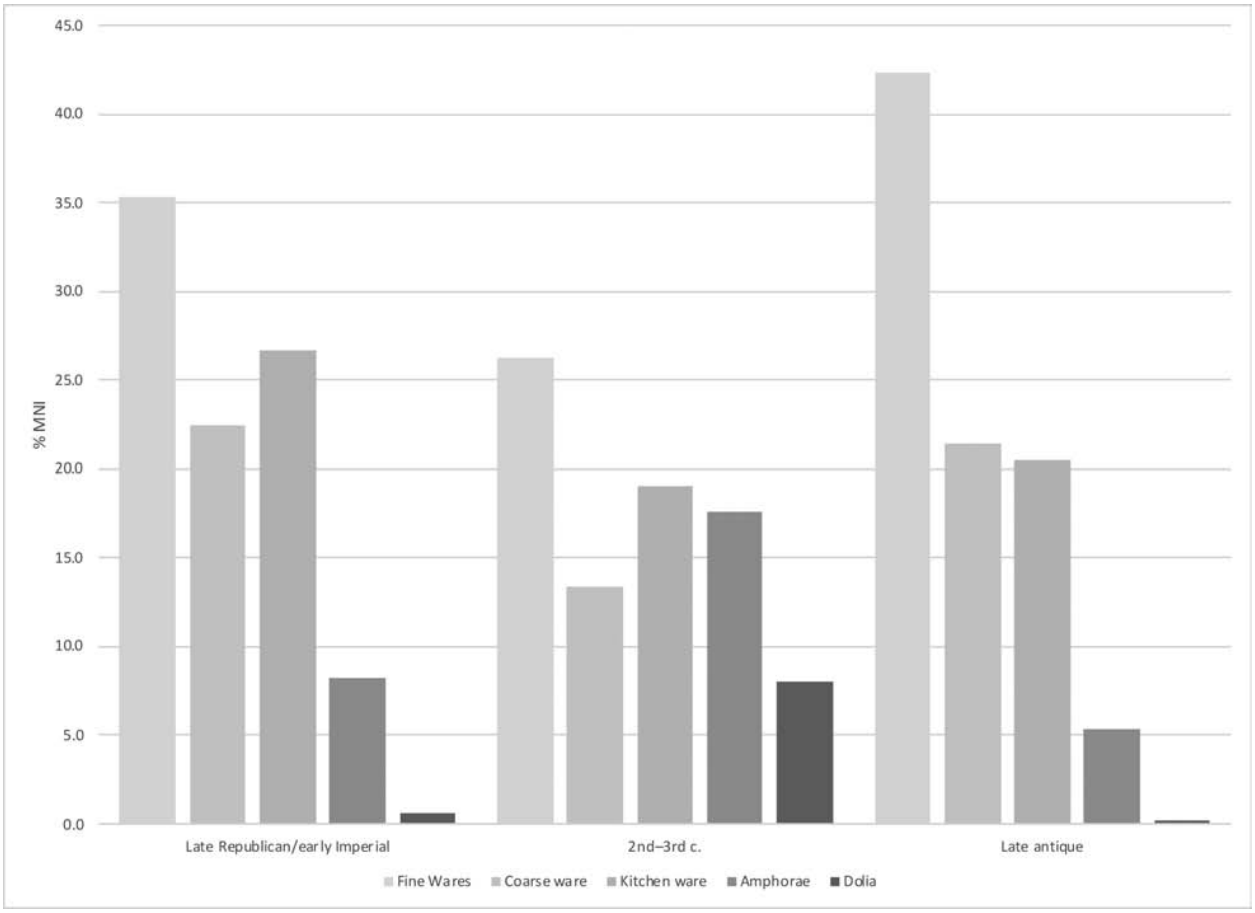


Fig. 15.2 Major ceramic classes by period, all sites, by % MNI. Fine wares for late Republic include: Black glazed ware, Italic sigillata, thin wall ware, Experimental sigillata; 2nd–3rd c.: African red slip ware, Color-coated ware; SCT; late Italic sigillata; late antique: African red slip, Color-coated ware, SCT, late Italic sigillata (EV/KB).

AD). When it comes to evaluating the trade and distribution of glassware, the absence of maker's marks or other more precise technical details prohibits a clear picture of the rate of importation versus local production.

All of these trends are generally shared by wealthier rural villas in the region and, in their broadest parameters, by much of central Italy (Panella 2001). Unfortunately, very few central Italian villas have published their ceramics or glass in such a way as to render them quantitatively comparative with our data. Nonetheless, a more ad hoc comparison reveals some of the same basic patterns. The amphorae from the villa of Settefinestre, for example, suggest that in the 1st c. BC to 1st c. AD, the villa was supplied almost entirely through local/regional sources, producing large quantities of its own wine for export in Dressel 1 and later Dressel 2 amphorae and importing tiny quantities of Spanish garum. Later phases see the cessation of these large-scale local productions and their replacement with local/regional amphorae on a smaller scale. The high empire see an increase in African imports and eventually those from the Aegean. The quantities, of course, are exponentially larger at Settefinestre, itself a major coastal wine exporter, and, also for this reason, the overall dominance of locally produced amphorae seems clearer. Settefinestre also obtained amphora born food-stuffs from places largely absent in the project studies: mid-imperial Dressel 20, oil-bearing, Baetican amphora most notably, but also Adriatic and Gallic products (Cambi and Volpe 1985).

Table 15.9 Glass finds by site quantified by number of fragments (SCE).

	Pievina	Case Nuove	Poggio dell'Amore	Podere Terrato	Marzuolo	Tombarelle
Balsamarium	—	—	—	—	2	—
Beaker	10	31	—	1	20	—
Beaker (Isings 106/109/111)	1	—	—	—	—	—
Beaker (Isings 109)	4	—	—	—	—	—
Beaker/Lamp	—	—	—	—	3	—
Bottle	—	—	2	—	14	—
Bottle (Isings 50)	—	—	—	—	10	—
Bottle Jar	—	—	—	—	1	—
Bowl	1	—	—	1	20	—
Bowl (Isings 44a)	—	—	—	—	3	—
Bowl or Cup	—	—	—	—	3	—
Bowl or Cup (Isings 12)	3	—	—	—	—	—
Closed	—	—	—	—	2	—
Discard	—	—	—	—	11	—
Double Bottle	—	1	—	—	—	—
Goblet (Isings 111)	4	—	—	4	—	—
Goblet (Isings 21)	—	—	—	—	1	—
Lamp	—	—	—	—	1	—
Lid (Isings 66a)	—	—	—	—	1	—
Modiolus	—	—	—	—	2	—
Pellet	—	—	—	—	1	—
Pitcher/Bottle	—	—	—	—	1	—
Plate	1	—	—	—	34	—
Ribbed Bowl (Isings 3)	—	20	—	—	4	—
Rod	—	—	—	—	1	—
Small Amphora	—	—	—	—	2	—
Small Amphora/Bottle	—	1	—	—	—	—
Small Amphora/Jug	1	—	—	—	—	—
Small Bottle	—	1	—	—	—	—
Small Bottle?	—	—	—	—	3	—
Small Bowl	—	1	—	—	—	—
Window	5	—	—	—	43	—
NonId	75	35	21	18	7	4
Total	**105**	**90**	**23**	**24**	**458**	**4**

Table 15.10 Glass finds by site quantified by the estimated vessel equivalent (EVE) of fragments (SCE).

	Pievina	Case Nuove	Poggio dell'Amore	Podere Terrato	Marzuolo	Tombarelle
Balsamarium	—	—	—	—	1.00	—
Beaker	1.54	0.82	—	0.18	0.82	—
Beaker (Isings 106/109/111)	0.13	—	—	—	—	—
Beaker (Isings 109)	0.15	—	—	—	—	—
Beaker/Lamp	—	—	—	—	0.25	—
Bottle	—	—	0.00	—	3.11	—
Bottle (Isings 50)	—	—	—	—	0.00	—
Bottle Jar	—	—	—	—	0.81	—
Bowl	0.05	—	—	0.00	0.63	—
Bowl (Isings 44a)	—	—	—	—	0.09	—
Bowl or Cup	—	—	—	—	0.48	—
Bowl or Cup (Isings 12)	0.07	—	—	—	—	—
Closed	—	—	—	—	0.00	—
Discard	—	—	—	—	0.00	—
Double Bottle	—	0.00	—	—	—	—
Goblet (Isings 111)	0.74	—	—	—	—	—
Goblet (Isings 21)	—	—	—	—	0.00	—
Lamp	—	—	—	—	0.55	—
Lid (Isings 66a)	—	—	—	—	0.13	—
Modiolus	—	—	—	—	0.03	—
Pellet	—	—	—	—	0.00	—
Pitcher/Bottle	—	—	—	—	0.00	—
Plate	0.10	—	—	—	0.99	—
Ribbed Bowl (Isings 3)	—	0.35	—	—	0.00	—
Rod	—	—	—	—	0.00	—
Small Amphora	—	—	—	—	0.00	—
Small Amphora/Bottle	—	0.00	—	—	—	—
Small Amphora/Jug	0.50	—	—	—	—	—
Small Bottle	—	0.00	—	—	—	—
Small Bottle?	—	—	—	—	1.00	—
Small Bowl	—	0.00	—	—	—	—
Window	0.00	—	—	—	0.00	—
NonId	0.12	0.00	0.00	0.09	3.66	0.00
Total	**3.39**	**1.17**	**0.00**	**0.28**	**13.55**	**0.00**

15.2.2 Production and Consumption inside the Locale

If most Roman rural production and consumption is centered on the locale, this does not mean that production, consumption, and exchange therein was either simple or homogeneous. Rather, our data point to a wide range of production activities of differing scales aimed at an overlapping range of consumers. Very little of this activity can be accurately described as "autarkic." Rather, most seems to have involved both households and extra-household actors as producers and consumers. Moreover, exchange within and without the locale emerges as germane to production and potentially oriented towards export.

Leaving aside agricultural production (discussed in Ch. 13 above) and starting with the smallest-scale, household-oriented production, the project produced only fragmentary evidence for textile and possibly leather working activities. These activities tended to concentrate in sites at the longer end of the habitation spectrum, at Pievina Phase 2 and to a lesser extent Marzuolo Phase 1. At Pievina Phase 2, a small quantity of finds from in and around the modest house indicate limited textile and possibly leather working: two shuttle threads, one (SF 301015) from the abandonment layer over the drain on site (SU 1023), the other (SF 301058) from SU 1014 (see Fig. 4.25), attest to wool working. Also present is a copper alloy awl (SF 301051), which comes from SU 1003, used in wood or leather working. From the earlier stages of ceramic production at Marzuolo, when the workers were seemingly living in close proximity to the kilns in Area 3, a series of loom weights were found in dumps nearby (SF 512008, 512009, 512010, 511005) (see Fig. 10.76). As loom weights were rare finds in our sites, this concentration is notable and probably points to household textile production.

Products produced principally for domestic consumption, but which may have had broader "overflow" circulation, were roof tiles and coarse wares. The Pievina kiln began almost certainly to produce roof tiles for the late Republican site (see Fig. 4.8). This may have been the case at Tombarelle as well, with its large stamped tile bearing an Etruscan inscription, although neither buildings or kilns were ever found (see Ch. 11). The coarse ware wasters from the late 1st c. BC and mid-1st c. AD at Tombarelle may also indicate that coarse wares were made here, while the presence of kiln spacers and the considerable quantities of overfired Color-coated ware from the mid-5th c. AD dumps indicate the continuity of that production through late antiquity.

Our project did not subject these tiles or coarse wares from Pievina and Tombarelle to thin section analysis for comparison with other tiles or coarse wares from other sites. We, thus, cannot know to what extent tile and ceramic production at these sites was entirely dedicated for autarkic uses or whether these kilns sold excess production to neighboring sites.

Ghisleni's (2010:84, 260) field survey isolated some seven kilns of probable late Republican/early imperial date, many of which were located near larger sites identified as villages or villas (e.g., Pievina, Santa Marta, Podere Pozzuolo, Podere Marzuolo) (Fig. 15.3). Ghisleni was able to identify two general types of fabrics used in roof tiles found throughout the study area: one of that appeared in sites dated to the late Republic/early empire and a second in those dated late antiquity and, thus, was able to assign scatters with tiles to specific periods. (Ghisleni 2010: appendix 1). She suggested that a network of such kilns, associated with larger sites, supplied the region during the late Republic. She assumed that larger, more permanent sites like Pievina, with its small tile kiln, was selling its excess production to smallholders in the area.

While further work is required to confirm this hypothesis, specifically a detailed series of thin-section analysis, the hypothesis is persuasive, particularly in the context of the functional distinctions between larger more permanent sites and smaller, more ephemeral ones. We should also imagine a possible local market in recycled roof tiles: as we witnessed at Poggio dell'Amore, building materials of all kinds were likely recycled from ephemeral sites: these may have been simply taken and/or removed for resale (Pettegrew 2001; Pettegrew 2006; Peña 2007; see also Ch. 16).

Another example of production at the medium scale, aimed beyond the household to outside consumers within the locale, was wine. A newly identified series of local amphorae were found at Marzuolo Phases 1 and 2 and Tombarelle Phase 1 and 2. In the Augustan period, these included one with triangular rim, whose shape is reminiscent of the Dressel 1 type, but with grooved handles and a flat/ring foot base; and one with funnel-shaped ("imbuto") rim. In the

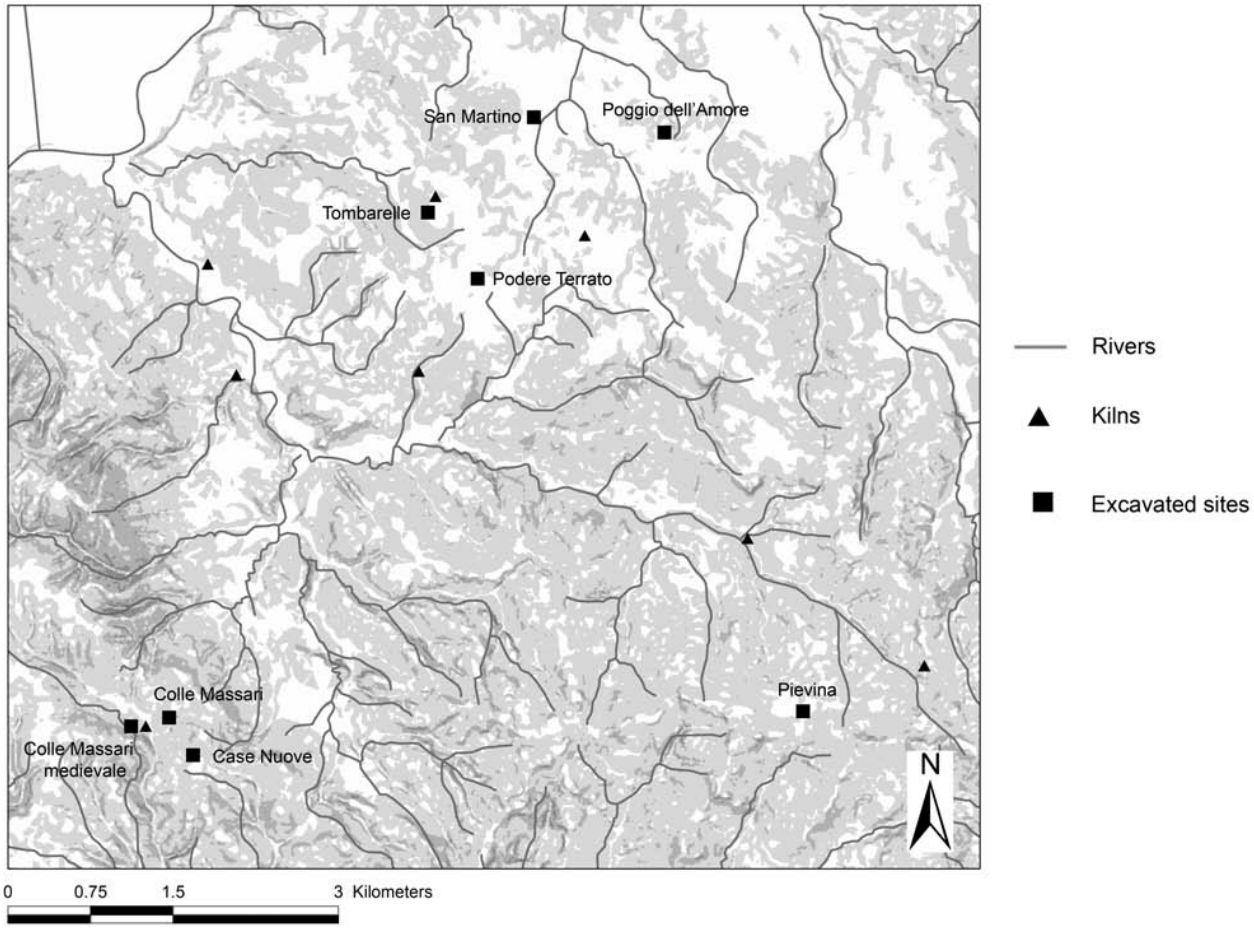


Fig. 15.3 Map of kilns, identified in Ghesleni's 2009 survey (ERZ).

Flavian period, two flat-bottomed types in the tradition of Spello amphorae appear: a larger one whose height must be between 55 and 60 cm and a smaller one (see Chs. 10 and 11). While we never found the kilns in which these were produced, we have hypothesized that Marzuolo may have been one such production point, making amphorae as well as fine wares.

These previously unknown, flat-bottomed amphorae would have held smaller quantities of wine than the long-distance amphorae, intended for transport by cart or donkey and, eventually, also by river barges. Their presence here is probably the tip of an iceberg of smaller-scale container production for local/regional circulation of foodstuffs, undocumented in central Italy until recently (cf. Patterson et al. 2005; Cherubini, Del Rio, and Menchelli 2006; Fracchia 2006). These kind of amphorae attest to the robust production and circulation of agricultural surpluses and consumer goods within regions. The fact these local amphorae outnumber imported examples in the two amphorae assemblages at Marzuolo illustrates the scale of this local production and how a scholarship focused on long-distance exchange can miss the more numerically significant local movement of amphora-borne goods.

15.2.3 Production for the Locale and for Export: The Case of Marzuolo

Too often in economic studies production for local consumption is assumed to be distinct in character from production for export (cf. Morel 2009). The former is presumed to be small in scale and modest in its ambitions such as the occasional excess from subsistence strategies. Production for export is confined to large-scale, commercial monocultures like the

Tuscan wine industry or North African oil producers, or higher-value consumer goods.

Terra sigillata, the Roman fine ware par excellence, is supposed to be one such export-oriented product, made in vast quantities for distant markets. Clustered in and around Arezzo, Pisa, and the Tiber Valley, central Italian sigillata facilities were assumed to have been built principally to satisfy urban consumers from the Tuscan cities to Rome (Fig. 15.4). The recently discovered site at Scopietto in Umbria has also been viewed in this light, despite the logistical difficulties presented by its topographically challenging location (Bergamini 2007a and b), while the Tuscan Torrita di Siena has been interpreted as a second-tier facility serving local and regional demand (Pucci 1992). In none of these studies has rural demand by peasants ever been considered as part of the market strategies of these fine ware workshops (cf. Van Oyen 2015b).

Recent work is beginning to revisit these assumptions or at least imagine forces at work aside from urban demand. New work on coarse ware production from France to Egypt is documenting the close connection between agricultural intensification, expanding settlement, and concomitant local ceramic production sites (Rieger and Möller 2011; Pigière and Lepot 2014). More impressionistic work has made the same argument for the area around Volterra, suggesting that local elites invested in intensified agriculture alongside Italic sigillata production and exploited different portfolios of their land for each (Pasquinucci and Menchelli 2005; Cherubini, Del Rio, and Menchelli 2006). Studies on sigillata distribution in Britain, a province that had no indigenous

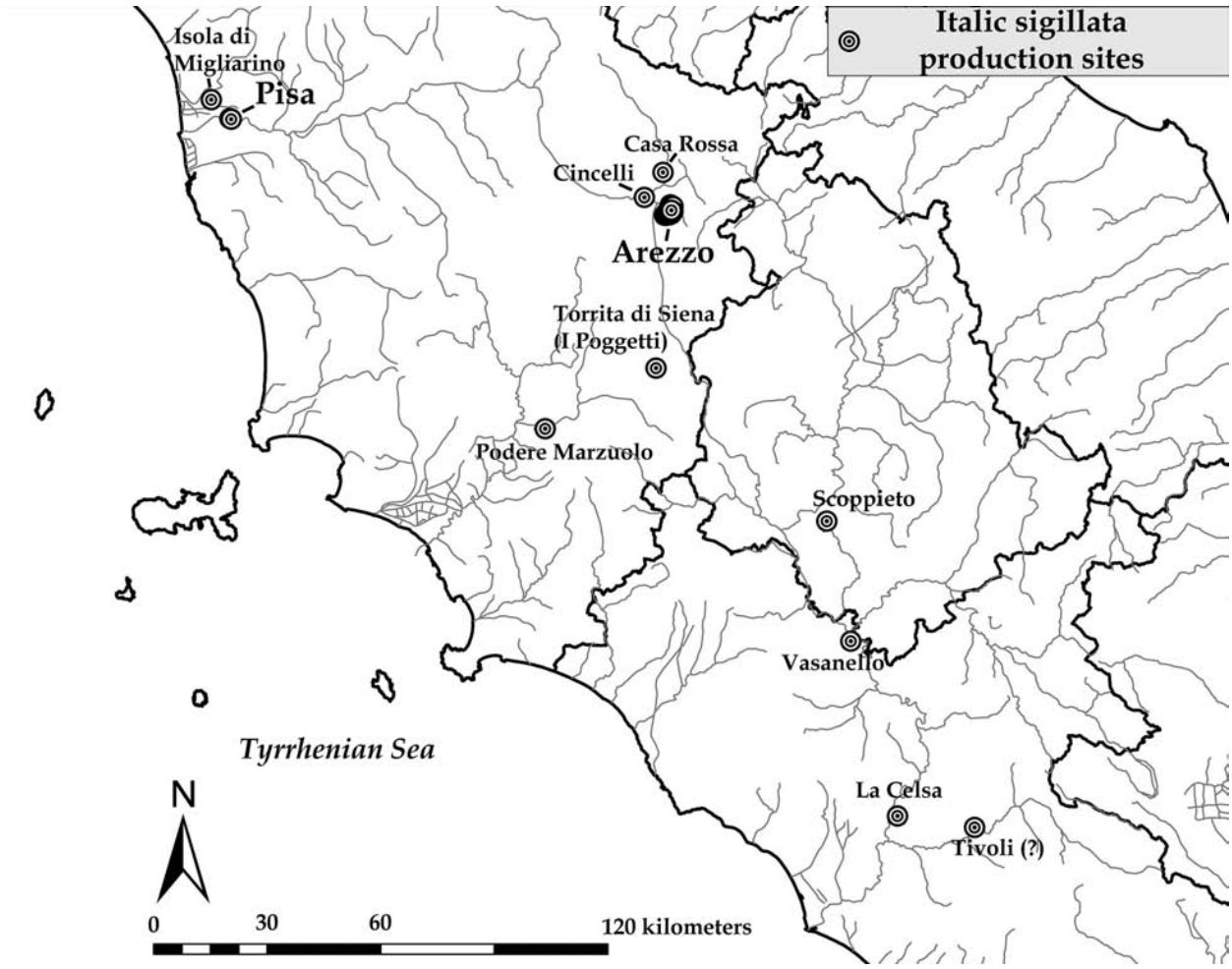


Fig. 15.4 Map, Distribution of known Italic sigillata workshops in central Italy (after Vaccaro, Capelli and Ghisleni 2017:237, fig. 9.4)

production but imported all "Samian" ware from France, has mapped distribution patterns in which major towns acted as hubs in road-born networks of smaller towns: minor rural sites not located on roads were only secondary or tertiary points in these networks (Willis 2005). Van Oyen's re-envisioning of the Italian industry, including the site of Marzuolo, has argued that those networks exhibited varying degrees of densities, rather than any clear urban/rural binary (Van Oyen 2015b).

We were fortunate in the RPP to have both a big extant dataset on local ceramic consumption—from Ghisleni's survey and our own excavations—as well as a nucleus of Italic sigillata production at Marzuolo. Marzuolo saw its first phase of sigillata production from c. 30–10 BC, when the craftsperson who signed pots as "SEX" or "SEXTI" (see Fig. 10.47) and presumably others, experimented with early attempts to produce high-temperature slipped wares. Three kilns, probable muffles used to insulate the wares, and mixed dumps containing the wares themselves were found in Area III, Phase 1 (see Ch. 10), leading us to conclude that Experimental sigillata was manufactured at Marzuolo in this period. "SEX" may or not be the same producer who is tentatively associated with Arezzo.

In the present state of knowledge, this phase was followed by a hiatus, although we have noted the presence of true sigillata of slightly later Julio-Claudian date with the Marzuolo fabric from adjacent sites in the locale. Then, in 50–70 AD, the site was again manufacturing late forms of Italic sigillata, as identified from the large-scale kilns in Area I. From the in situ stacks of misfired wares came products stamped by MANNEIVS, A.M () VRBANVS, L. VMBRICHIVS, and T. RVFRENVS (see Fig. 10.50 and Table 10.5). Manneius and the *gens* Umbrichia are known from the workshop at Torrita di Siena whereas Manneius and Rufrenus also seem to have been active in Arezzo (Pucci 1992:113–116, 143–145; Oxé, Comfort, and Kenrick 2000: #1099; 2470, 1730, respectively). While Manneius seems to have overseen production of a range of wares, other producers specialized in particular wares: Urbanus with Conspectus 21.3 and Conspectus 20.4 platters and Umbrichius with Conspectus 34 flanged cups. The size of the kilns beneath the church suggest the operation was a large one hosting communities of itinerant, specialized potters and support labor.

We have no data as yet to trace these Marzuolo wares outside the locale, yet wares bearing the various abbreviations of producers Manneius, A.M () Urbanus, and L. Umbrichius have been found as far away as Chiusi, Rome, Aquileia, and beyond (Oxé, Comfort, and Kenrick 2000: #1099; 2470, 1730), but, without thin-section and chemical analysis on the associated wares, it is impossible to know if these are from Marzuolo or wares made when these potters were based elsewhere. We did, however, carry out preliminary studies to gauge the sale of Marzuolo products closer to home, in the locale.

We subjected 11 samples of these so-called Experimental wares to thin-section analysis, along with samples of both Italic sigillata and Experimental sigillata from the field survey and project excavations in the locale (Vaccaro, Capelli, and Ghisleni 2017). The majority of the Marzuolo Experimental vessels revealed a distinct fabric, with medium-high texture including a small number of visible inclusions such as mica flecks and microfossils; sometimes voids produced by the decay of microfossils were observed as well. This fabric is different from those typical of the later, Arretine products. The slip, though thin, misfired and badly preserved when observed through a hand lens, is sintered in thin section. These wares appeared to have been manufactured at Marzuolo itself (Vaccaro, Capelli, and Ghisleni 2017 and Ch. 10).

The analysis also identified another type of fabric, not from the locale. One Conspectus 1 plate with a very badly preserved, thin slip of dark brown color and radial anepigraphic decorative stamps in the shape of a pelta was imported from a volcanic area in very southern coastal Tuscany or more likely Lazio/Campania. This identification was based on its fabric having inclusions of sanidine, clinopyroxene, and basalt in thin section. Thus, some of the 30–10 BC Experimental ceramics at Marzuolo were manufactured on site, while others were imported from outside the region.

When compared to ceramics from a selection of similarly dated sites from the locale, the results were similarly mixed. Only at Tombarelle and perhaps Santa Marta were Experimental wares found to be from Marzuolo. Pievina and Case Nuove yielded fragments of Experimental sigillata whose fabric is compatible with the S. Tuscany/Lazio/Campania volcanic source described above. Two more Experimental sigillata vessels from Pievina have a generic Tuscan

origin and one possibly came from the Livorno area (given the presence of probable serpentinite inclusions). However, true Italic sigillata of Julio-Claudian date found at Pievina Phase 1, Case Nuove Phase 1.2, and four surface survey sites (TU 166, 235, 309, 310) did match the Marzuolo fabrics (see Fig. 10.48). Interestingly, none of the ceramics tested came from the large production areas near Pisa or Arezzo.

A similar exercise, again of limited scope, was carried out with the later wares produced at Marzuolo ca. 50–70 AD. Under thin-section analysis, these were of far more consistent and higher quality fabric than the preceding wares: 15 samples from this deposit (SU 10093) bearing different stamps revealed the same type of levigated fabric rich in mica flecks, with microfossils and rare argillites. The slip instead was highly characteristic: it is relatively thick, well sintered and highly levigated. These fabrics again show no parallels with known products from Arezzo or Pisa.

Study of the ceramics in the locale did not produce precise matches for these later Marzuolo fabrics as they did for the preceding period. This is not terribly surprising given the dearth of both excavated and surface contexts belonging precisely to the mid/second half of the 1st c. AD: most of the sites in the locale date between second half of the 1st c. BC and first decades of the 1st c. AD and exhibit a drop immediately after. Nonetheless, it should be noted that a few Italic sigillata vessels from Poggio dell'Amore are characterized by a fabric macroscopically similar to these later Marzuolo wares.

A few observations are in order from this admittedly limited study. First and perhaps most obvious is the clear marketing and purchase of at least the earlier Marzuolo sigillata by local consumers. These fine wares were not simply shipped off to distant cities, but also sold locally. Equally as noteworthy is the variety of sources from which local peasants were obtaining their fine wares even when a local product was available: ceramics from as-yet unlocated factories from southern Tuscany/Lazio/Campania and north near Livorno were also being imported into the area. Even Marzuolo itself, it will be remembered, was not only producing Experimental vessels but importing some as well. Third, while more work is required to confirm the distribution of the later wares of the 50–70 AD period, it is possible that this larger facility was oriented more towards distant markets than its predecessor had been. Given the seemingly fewer sites being built or maintained in the locale during the mid to late 1st c. AD, local demand may have shrunk. The seeming reactivation of the Marzuolo factory may have shifted from a strategy aimed at both local and distant consumers, to one oriented more distantly.

In addition to partially supplying the locale with its fine wares at various points in history, Marzuolo may have also served as a source for both the manufacture and sale of metal tools. Marzuolo yielded the highest number of metal small finds of any site in the project, ranging from some 242 nail fragments to tools like anvils and buckets to ornaments for people and domestic objects (Table 15.11). Further, the surface survey and, to a lesser extent, the excavations produced large quantities of metal slag, the byproducts of metalworking. New excavations by Van Oyen and Vennarucci have revealed a blacksmith's workshop, probably servicing the site's tool needs (Van Oyen and Venarrucci 2017). A ceramic production site like Marzuolo would have daily need for metal tools and would have needed the capacity to repair such tools, if not produce them from either raw or recycled iron. It would have taken delivery of raw or recycled iron and maintained a craftsperson or two who was skilled in tool production. Given both a supply of raw material and skilled labor, it is possible that this site-oriented production may have sold excess products to peasants in the locale, much as Ghisleni hypothesized for roof tiles.

15.3 Geographies of Exchange (CG, KB)

The multiple scales of production and consumption described above, from household to the pan-Mediterranean, beg the question of where exchange happened. How did goods come to move from the place of production to the point of consumption, which kinds of places witnessed exchange, coined or otherwise, and which did not?

The project data suggests a number of possibilities but no single answer. We never located a rural market, and some of the data seems to point against such a place for certain kinds of goods. Indeed, the very heterogeneity of the data indicate no single point where exchange happened but, like the layered, multi-scalar nature of production, suggest a network

Table 15.11 Total count (fragments + intact) of metal finds by site (SCE).

Material	Object	Pievina	San Martino	Case Nuove	Poggio dell'Amore	Colle Massari	Podere Terrato	Marzuolo	Tombarelle
Copper Alloy	Appliqué	—	—	—	—	—	—	1	—
Copper Alloy	Awl	1	—	—	—	—	—	—	—
Copper Alloy	Binding	—	—	1	—	—	—	1	—
Copper Alloy	Button	—	—	3	—	—	—	—	—
Copper Alloy	Chain	—	—	—	—	—	5	1	—
Copper Alloy	Cord	—	—	—	—	—	1	—	—
Copper Alloy	Decoration	—	—	—	—	—	—	4	—
Copper Alloy	Double Rings	2	—	—	—	—	—	—	—
Copper Alloy	Dress Pin	—	—	—	—	1	—	3	—
Copper Alloy	Fibula	—	—	—	—	—	3	—	—
Copper Alloy	Finger Ring	—	—	—	—	—	—	1	—
Copper Alloy	Harness Button	2	—	—	—	—	—	—	—
Copper Alloy	Harness Junction	1	—	—	—	—	—	—	—
Copper Alloy	Harness Mount	—	—	3	—	—	—	—	—
Copper Alloy	Harness Pendant	—	—	3	—	—	—	—	—
Copper Alloy	Knob	—	—	—	—	—	—	1	—
Copper Alloy	Lamina	1	—	39	—	—	—	1	1
Copper Alloy	Lock Bolt	—	—	—	—	—	—	1	—
Copper Alloy	Nail	—	—	—	—	—	—	8	—
Copper Alloy	Necklace	—	—	—	—	—	—	1	—
Copper Alloy	Needle	—	—	—	—	—	—	1	—
Copper Alloy	Pin	2	—	—	—	—	1	3	—
Copper Alloy	Ring	—	—	—	—	—	1	5	—
Copper Alloy	Seal Box	—	—	—	—	—	—	1	—
Copper Alloy	Shuttle Thread	2	—	—	—	—	—	—	—
Copper Alloy	Stud	—	—	—	—	—	—	4	—
Copper Alloy	Tack	1	—	4	—	—	—	1	—
Copper Alloy	Tweezers	—	—	—	—	—	—	1	—
Copper Alloy	Vessel Handle	2	—	—	—	—	—	1	—
Copper Alloy	Vessel Lid	—	—	—	—	—	—	1	—
Copper Alloy	Vessel Rim	—	—	—	—	—	—	1	1
Copper Alloy	Vessel Support	—	—	1	—	—	—	1	—
Iron	Anvil	—	—	—	—	—	—	4	—
Iron	Awl	—	—	—	—	—	—	1	—
Iron	Collar	1	—	1	—	—	—	—	—
Iron	Cord	—	—	—	—	—	—	8	—
Iron	Door Bolt	—	—	—	—	—	—	1	—

Table 15.11 cont'd Total count (fragments + intact) of metal finds by site (SCE).

Material	Object	Pievina	San Martino	Case Nuove	Poggio dell'Amore	Colle Massari	Podere Terrato	Marzuolo	Tombarelle
Iron	Hematite	—	—	—	—	—	—	2	—
Iron	Hinge	—	—	4	—	—	—	—	—
Iron	Hook	1	—	—	—	—	—	1	—
Iron	Lamina	—	—	29	—	—	—	6	—
Iron	Nail	54	3	47	1	—	3	242	14
Iron	Ring	—	—	1	—	—	—	4	—
Iron	Slag	20	—	24	—	—	—	30	16
Iron	Sword	—	—	—	—	—	—	1	—
Iron	Tool	2	—	—	—	—	—	—	—
Lead	Flow	—	2	5	—	—	—	5	—
Lead	Lamina	—	—	—	—	—	—	3	—
Lead	Weight	—	—	—	—	—	—	1	—
Copper Alloy	Non ID	5	—	12	—	—	4	15	—
Iron	Non ID	6	—	13	—	—	—	4	—
Lead	Non ID	1	—	—	—	—	—	—	—
Non ID	Non ID	—	—	—	—	—	—	—	6
Iron	Modern	—	—	—	—	—	—	4	2
Total		**104**	**5**	**190**	**1**	**1**	**18**	**376**	**40**

of exchange where different goods were bought and sold in various kinds of places.

The *nundina* or periodic market, looms large in the historiography of rural economies as the imagined site of most rural exchange. *Nundinae*, as their name implies, were periodic markets that took place according to a weekly (nundinal) or other cycle. Such markets could be urban or rural, and took place in a different location each cycle, seemingly much as French and Italian rural markets do today. While the textual references to the rural version of these markets is relatively common, no convincing *nundinae* have ever been excavated, and, indeed, the idea that these are specialized places is probably wrong. Rather than the purpose-built emporia of the early middle ages, rural *nundinae* were probably not purpose built places but rather central points with other functions—rural temples, villages, baths, etc.—that also hosted periodic markets.

We should probably also imagine similar flexibility in the timing of such markets in the countryside. In Italy, most of the information for scheduled, cyclical markets comes from urban contexts (Frayn 1993, Ligt 1993). While such timed markets doubtless existed in the countryside, the same central places that hosted the markets may also have goods for sale on other days, in keeping with their "normal" functions as centers of worship, habitation, hostelries, etc.

Marzuolo may have served as such an informal exchange center in our locale. Its position on an important routeway from coast to interior and proximity to fording points on the Orcia River made it a central place from its days as a ceramic manufactory through the church located over those ruins. It would have hosted a seasonal population of both locals, assisting in the ceramic work, and itinerant skilled potters, while peripatetic traders and shippers would have carried its wares to local and distant markets and, presumably, have been responsible for the large quantities of imported amphora-born food stuffs found in Phases 2 and 3, as well as the smaller quantities of imported ceramics found in all phases. Marzuolo was a place where goods were produced, imported, exported, and stored, and, as a result of these

activities, it attracted a diverse population of locals and travelers. As a candidate for a formal or informal local market, it has obvious attractions.

Some of the data suggest Marzuolo did serve some of these functions: ceramics were clearly purchased from Marzuolo in Phase 1 and consumed by local peasants. The small local and imported amphorae storage center in Area I, placed in seatings ready for consumption, may also indicate that wine and fish sauce were available for purchase, while the local wine amphorae themselves may have even been produced here. Finally, as noted above, Marzuolo may have served as a production/repair and possible sale center for metal tools.

And yet, the coin data problematizes this interpretation. The relatively low quantities of coins from Phases 1–2 indicate only modest coined exchange in these periods but, paradoxically, potentially more in Phase 3 when the site no longer produced ceramics. As we have noted above, however, coin supply in different periods may impact the data, and even the modest finds do suggest some exchange activity. It may simply be more modest than we imagine, or it may have been largely non-monetary.

Even were Marzuolo a place to purchase some items some of the time, it was clearly not the only place of exchange, even for its principal product, ceramics. The presence of both local *and* imported wares at Marzuolo and at the project sites it supplied is the strongest indicator away from the one-stop-shop model of rural supply and towards complicated networks with multiple points and actors.

The 5th c. ceramic data from Pievina suggests yet another model. As outlined in Chapter 4.1 and Ghisleni et al. (2011), the forms of wares from Phase 2 are almost identical in their range from those found in a contemporary workshop in the nearby city of Roselle (see Table 4.4). Twenty-two such forms were identified at Pievina and 25 at Roselle; both assemblages include approximately the same range of tablewares, with slight differences in open versus closed cooking wares, the rural site favoring closed and the urban site open. The mix of imports (11.5% at Pievina versus 16.8% at Roselle) are likewise similar, as are the origins of those imports: a small quantity of Tunisian ARS whose forms are identical at both sites, and a preference for Portuguese fish sauce (Almagro 51A/B and Almagro 51C) as the only amphorae-born foodstuffs.

The extent of these similarities suggests a direct connection between Pievina and Roselle in this period, unmediated by a local market or middleman. This direct connection either would have seen the inhabitants of Pievina buying their pots in Roselle or a traveling peddler coming directly from Roselle to Pievina (see Vol. 1: Color Fig. 4.11). It is also possible that both Pievina and Roselle were themselves supplied directly from a third party, e.g., a coastal port-*cum*-production center like Scoglietto at the mouth of the Ombrone and the supply port for Roselle (Sebastiani et al. 2015), for instance.

While local marketplaces like Marzuolo or direct importation from cities and ports are possible geographies of exchange, the vast majority of the data suggests a plurality of exchange points exploited simultaneously. The sheer heterogeneity of the ceramic assemblages points strongly in this direction and the most sporadic sites, like San Martino and Poggio dell'Amore, present it most starkly. San Martino yielded 326 sherds from stratified contexts, among which were nine different classes of ceramics and 18 forms. The three different kinds of fine wares (Experimental and Italic sigillata, Black glazed ware) are themselves produced in different areas and are *not* from Marzuolo, while the variety of non-standardized cooking pots points to similarly diverse production points. Poggio dell'Amore was somewhat less diverse with five different classes and ten functional classes. Some of the Italic sigillata from here may have matched fabrics from the 50–70 AD phases at Marzuolo, while others were either earlier or seemed to come from elsewhere. The cooking pots and possibly the Tyrrhenian-originated Dressel 2/4 amphora have yet other sources.

Possibly the users of these sites purchased all these goods at a single point. However, it is far more likely that they were acquired at multiple points—ranging from local production/exchange centers like Marzuolo or Tombarelle to traveling peddlers to urban markets (cf. Bang 2008). In the case of these smaller, sporadic sites, we should imagine that pots are probably first obtained for use at the more permanent habitation and carried out for occasional use at the seasonal work huts. This would account for occasional examples of "antiques" found at these sites, like the possibly 2nd c. Black glazed ware at San Martino and early Augustan Italic sigillata at Poggio dell'Amore. Accumulated over the years from

different sources and deployed in the household's activity areas, these ceramics reflect the multiple geographies of exchange available to even rural peasants.

15.4 Conclusions

The peasant markets revealed by the data are poorly described by terms used in earlier historiography such as "autarky," "barter economies," and "subsistence production." None accurately describe the layered web of local and long-distance, household and extra-household, coined and in-kind exchanges that characterize every aspect of peasant markets as we have found them. While the scale of these exchanges may be tiny—indeed, the extremely small sample sizes for most of our datasets is one of their most notable qualities—the nature of exchange was rich and complex.

Complexity here takes place locally but gestures to the supra-local at every turn. Household production like roof tiles spins readily into local-exchange; the local ceramic factory produces for cities even as it produces for the peasant farmers who help work the kilns; Portuguese fish sauce, consumed on regional imitations of African plates, might be purchased at the city or port a day's ride away. Even in this relatively liminal region, "local" is everywhere permeated by a larger world and goods go in and out through the holes.

That permeability meant that the major sine-waves of Roman economic change were felt strongly in the locale. The supply of money broadly echoes patterns across central Italy; the geographies of imported foodstuffs—from the Tuscan coast to Gaul to Spain to North Africa, Portugal and the East—follows the trends evident in cities and villas; and rural sites continued to be connected to the markets of city and coast through, but not past, the mid-5th c. AD.

NOTES:

15.1 Note that Fig. 15.1 does *not* contain 2nd–3rd c. BC issues. These show such an enormous range (see Table 15.4), particularly an usually high number at Roselle, as to render the longer term trends illegible.

16

Architecture and Recycling

Kim Bowes

The history of Roman architecture is largely a history of elite buildings: from domus to temples, city planning to public buildings, Roman architecture is imagined as large in scale, sophisticated in form, and emblematic of the imperial project more generally. Likewise, the study of Roman architectural materials has focused on those which brought the Roman architectural moment into being, *pozzolana*-based concrete, brick, and an imperial-wide market in building stone.

The types of buildings excavated by this project, as well as their materials, are largely left out of these histories. Short-term work huts, animals stalls and pens, primitive open-air presses, field drains, even farm houses themselves stand outside the canon of Roman architecture. While more monumental farm buildings such as granaries have seen some study, particularly in the provinces (Morris 1979; Ferdière 2015; Van Oyen 2015a; Salido Domínguez 2017), non-villa rural architecture in Italy is largely ignored (exceptions: Rossiter 1978; Bacchetta 2003; Marzano 2007). Many of the characteristics of these less monumental, more ephemeral rural structures have, in contrast, been labeled quintessentially non-Roman. Earthen, wooden, and/or dry stone construction were used to periodize a proto-Roman building culture (Blake and Van Deman 1947) or have been attached to narratives of social and economic decline associated with the end of empire and the advent of the Middle Ages (Le Goff 1988:203; Brogiolo 1994; Ward-Perkins 2005). Wood particularly, but also straw and earth are sometimes viewed through an ethnic lens, their presence particularly in the late empire the evidence of "barbarian" or non-Italian traditions (Valenti 1996).

As this project has suggested, the majority of small sites found in Italian field surveys may very well represent more short-term structures, particularly in the late Republic through early empire. These more ephemeral buildings and longer-use structures like those from Pievina and Marzuolo all share a common construction technology of mortared or dry stone socles supporting pisé or cob. Thus, it is likely that the most common building technique throughout 2nd c. BC through 1st c. AD Roman Italy was, in fact, precisely these earthen and dry stone constructions. Far from being indicators of technological primitivism or decline, they may be seen to constitute the very heart of Roman building at precisely its moment of greatest expansion.

This chapter examines the form and materials of structures uncovered by the RPP. It pays particular attention to the geological data on building stones, examining this across the temporal habitation spectrum, and considers the problem of recycling, both of stone and other materials like tiles and metal. The chapter likewise addresses the relative permanence or friability of these structures, which in many cases seem to represent a relatively great investment for

possibly little use, and finds cross-cultural comparisons for similar investment in ad hoc or seasonal architecture. All of this data, particularly when considered in a comparative perspective, provides evidence for a quintessentially Roman kind of architecture, one which, while it differs in some materials, shares much in common with its monumental Roman brethren.

16.1 Materials and Form[1]

Almost every structure uncovered by the project begins with stone: from the field drain of Colle Massari Romano to the robbed-out stone press base at Case Nuove to the stone socles of Pievina, San Martino, Podere Terrato, Marzuolo, and even the robbed stone walls of Poggio dell'Amore. Roman peasant architecture as uncovered by the project is a stone-based architecture.

Most stone appears in stone socles—wall bases built of a single preserved, but likely originally double course of unshaped stones. These socles were set into shallow (i.e., 10–20 cm) trenches, cut very tightly around the planned wall so as to keep backfilling in the trenches to a minimum (e.g., Figs. 16.1 and 16.2). The stones were then laid in a rough double-faced style, with the larger, flatter surfaces used as faces and the center filled with smaller stones or more often with clay (Fig. 16.3). Socles were preserved to an average height of ca. 25–30 cm.

These stone socles were set in straight lines to form rectangular or square structures. Pievina Phase 2, Structure 4 and Podere Terrato Room 1 (two structures on the more permanent end of the temporal habitation spectrum) were both composed of stone-built rough squares (4.3 x 4.5 m and 5 x 5 m, respectively) with extensions in wood or stone (see Figs. 4.11 and 9.5, respectively). San Martino is likewise roughly square (7.2 x 6.5 m) (see Fig. 6.4), while Poggio dell'Amore (4.6 x 2.8 m estimated) and Marzuolo Phase 1, Structure 4 (11.5 x 5.5 m) are probably or certainly rectangular (see Figs. 7.5 and 10.37, respectively). None of these structures is precisely regular either in shape or alignment.

We assume that the upper structures of every stone-socled building we encountered, with the possible exception of Marzuolo Phase 2, were built of earth. Part of the evidence is negative: the surface scatter at all sites contained very few stones suitable for building, insufficient to have been the remnants of all-stone standing walls (cf. Russell and Fentress 2016:139). Of course, centuries of stone removal by local farmers could account for some of these putative missing stones. Even taking these removals into consideration, the absence of mortar in these buildings and the rough and irregular shape of the stones both mitigate against stone standing walls: mortarless walls of such stone would not have been structurally viable unless embedded in clay or other packing material. Other evidence is positive: at Pievina, Poggio dell'Amore, and Tombarelle, we found possible small pockets of particularly clean, often greenish clay-based matrix, hardened to near rock hardness (Color Figs. 16.4 and 16.5). At Pievina, too, we found fragmentary evidence of a finer exterior coat of this same material in collapse, possibly the remains of the hardened exterior of the wall. This evidence, together with the low-socles and negative evidence cited above indicates a preference for earthen construction in the upper walls. However, in no site did we find evidence for wooden frameworks or postholes, which could have supported the walls during construction. Were these walls built of earth, they must have used either non-anchored, portable frames (e.g., Houben and Guillaud 1994:204–209) or stacked construction.

These earthen walls would have taken one of two forms: pisé or cob. Pisé, sometimes known as *colata* in Italian, is an earthen construction built by ramming earth into moveable wooden formwork. Earth for pisé is extracted locally and is chosen for its particular mixture of alluvium, clay, sand, and gravel (Houben and Guillaud 1994). The wooden forms are placed atop the stone foundations and the sieved and prepared earth rammed into place, the forms being moved longitudinally and vertically as the building progresses (Figs. 16.6 and 16.7). The formwork, typically of wood, can be anchored by temporary posts driven into the ground, or with movable quoins (Centre de recherche et d'application - Terre 1979:12–72; Houben and Guillaud 1994:200–211). The exterior may be covered with a coating of either refined clay or lime plaster or left uncovered. This technique, with regional modifications, is well documented in both the Etruscan period and the Middle Ages and only vanished from Italian practice in the post-war period (Francovich, Gelichi, and Parenti 1980; Stopani 2004:28).

Fig. 16.1 San Martino, wall elevation (SU 4012).

Fig. 16.2 Marzuolo, Area II, (SU 11011/11013) wall elevation.

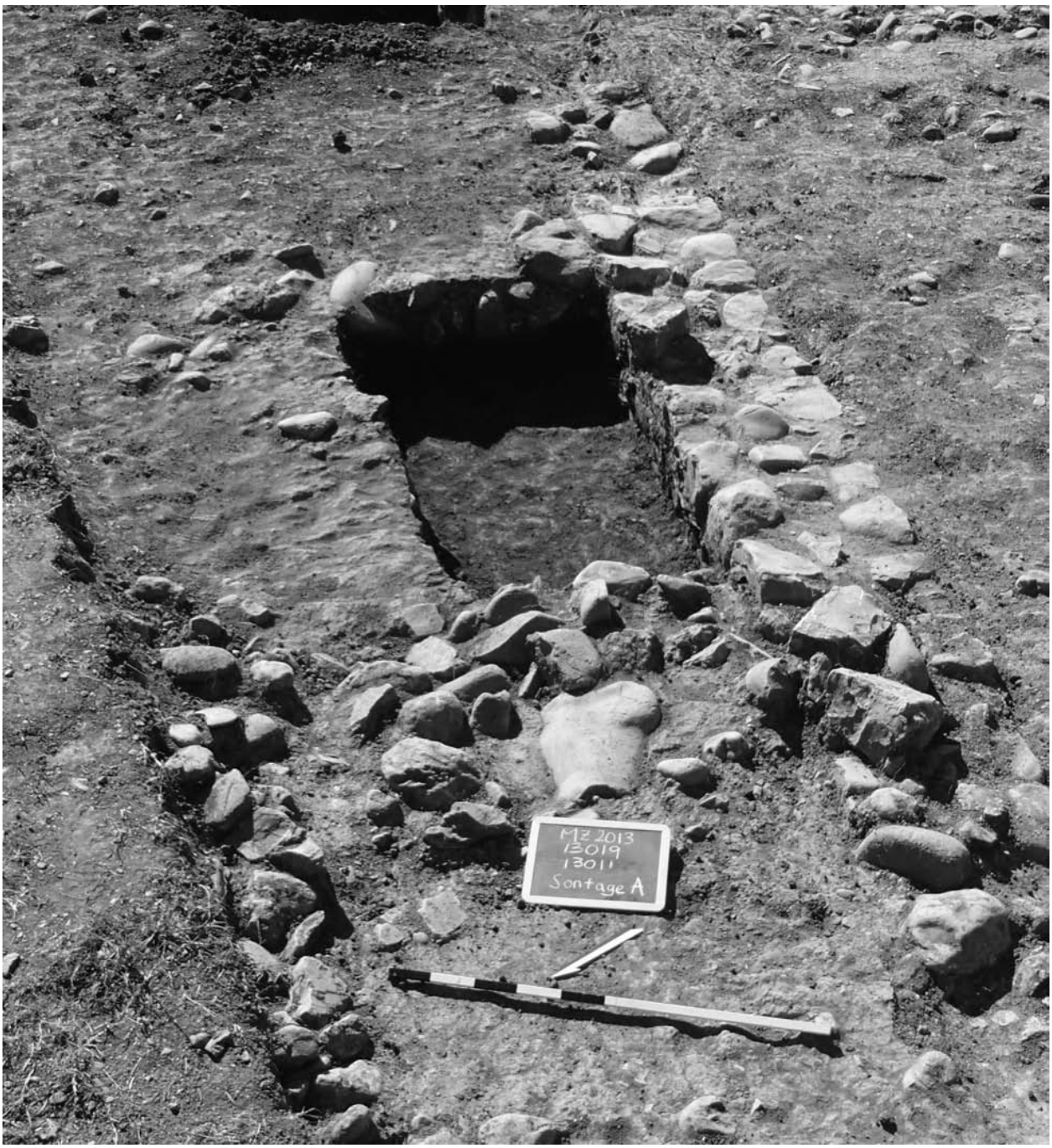


Fig. 16.3 Marzuolo, Area III, wall detail (SU 13011) showing two-faced wall construction

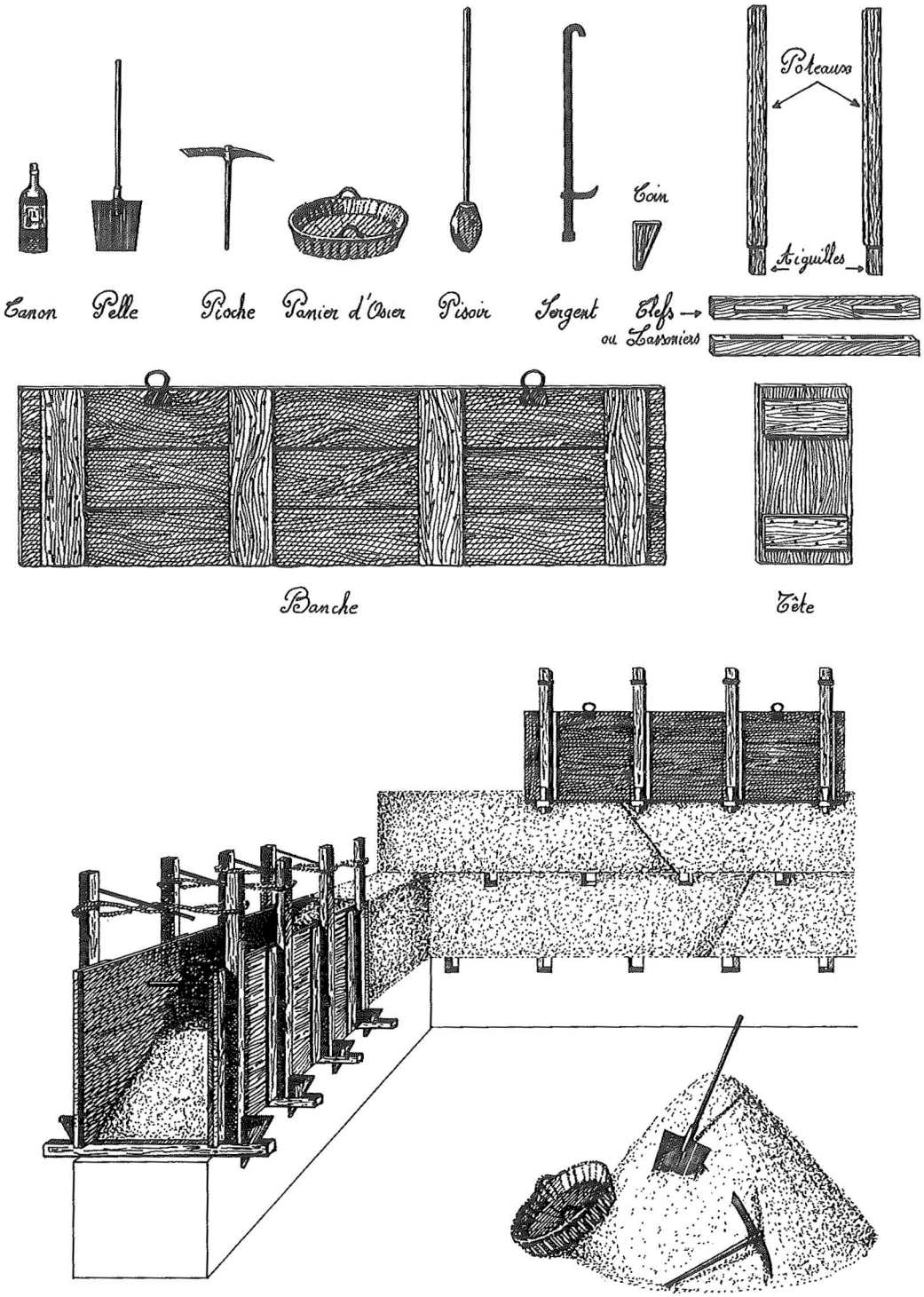


Fig. 16.6 Diagram of tools and formwork used in pisé construction (CRAterre, 1979. « Les outils du Piseur ». In: DOAT, Patrice, HAYD, Alain, HOUBEN, Hugo, MATUK, Sylvie,VITOUX, Construire en terre. Paris: Editions Alternatives. Coll. AnArchitecture. p.14. ISBN 2-862227-009-1.)

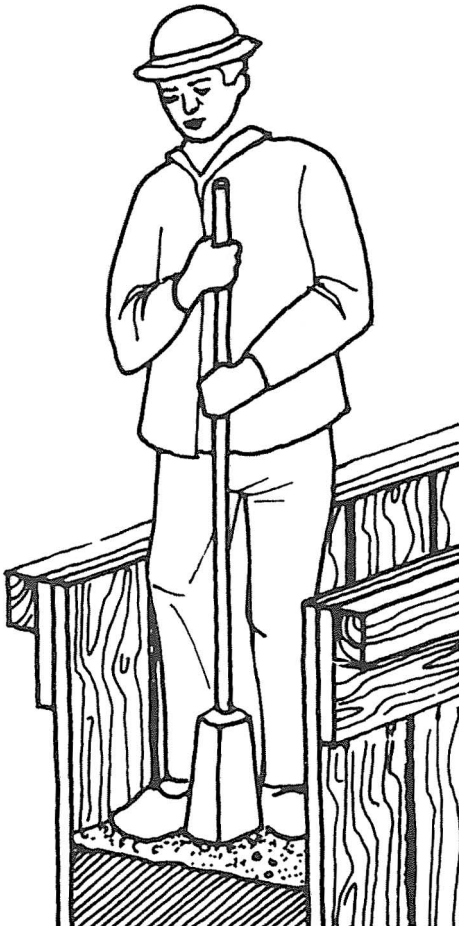


Fig. 16.7 Diagram of pisé ramming technique with formwork (Houben, Hugo, and Hubert Guillaud. 1994. *Earth Construction: A Comprehensive Guide*. London: Intermediate Technology: fig. 175).

In most well-studied examples (principally from France), pisé is composed of earth with a high sand/gravel content (Houben and Guillaud 1994). The Italian descriptions of modern practice (Francovich, Gelichi, and Parenti 1980:213, n. 66) emphasize clay content, and one study associates the density of early modern and modern earthen houses with geological concentrations of clay (Baldacci 1958). One of these early modern concentrations was in Tuscany, around Cortona and Arezzo, while other studies have located medieval and early modern examples throughout the province, including Grosseto (Francovich, Gelichi, and Parenti 1980:208–216).

Cob, or *bauge*, is a stacked earth technique. It uses clay-rich soils that are puddled and "degreased" with straw or chaff to improve their cohesiveness (Fig. 16.8). The resultant mixture is balled and either piled or thrown onto the wall (Centre de recherche et d'application - Terre 1979:93–105; Houben and Guillaud 1994:178–179). The best soil typically has a somewhat higher clay content than pisé, although not dramatically so, and is watered and worked by foot treading with straw or chaff before construction. Construction is slow, requiring two weeks of drying between wall levels and the outer surface is often treated to increase waterproofing. As with pisé, multistory structures can be built with cob and can last centuries. Unlike pisé, cob requires no wooden formwork, although it might be laid on a framework of cane. While common in areas of southern England and Brittany, it is, to our knowledge, not documented in Italy.

The project buildings could have been built either of pisé or cob. The very sticky clay remains from Pievina and Poggio dell'Amore point more to cob than the more gravely pisé and the heavily clay soils of the locale would also be better adapted to that method. The enigmatic pits in clay sources we discovered at Case Nuove and Tombarelle could have served as source points for cob clay, but there were no such structures at either of these sites. Wooden forms would have been potentially harder to come by in Tuscany, although later peasants certainly had them. In favor of pisé is the relatively better documented tradition of that technique in Italy; the Italian tradition for a relatively more clay-rich pisé, and the relatively quicker construction time, particularly for our more short-use buildings.

Earthen construction has seen little study by Roman architectural historians, in part due to its poor preservation and also because archaeologists have not thought, until recently, to look for it. The paucity of Roman sources on its use is in large part to blame. Vitruvius' *structura latericia*, sun-dried brick construction (*De arch*. 2.8.17–18), his *opus craticium*, half-timbered wattle-and-daub construction (*De arch*. 2.8.20), or his mention of mud/cane roofs (*De arch*. 2.1.5) are quite different from cob or pisé, on which the author is silent. Varro (*Rust*. 1.14.4: *ex terra et lapillis compositis in formis*) and Pliny the Elder (*NH* 35.48; *terra parietes, quos appellant formaceos*) both make brief mention of a technique in which earth is placed in formwork, seemingly a description of pisé packed earth construction. Both authors,

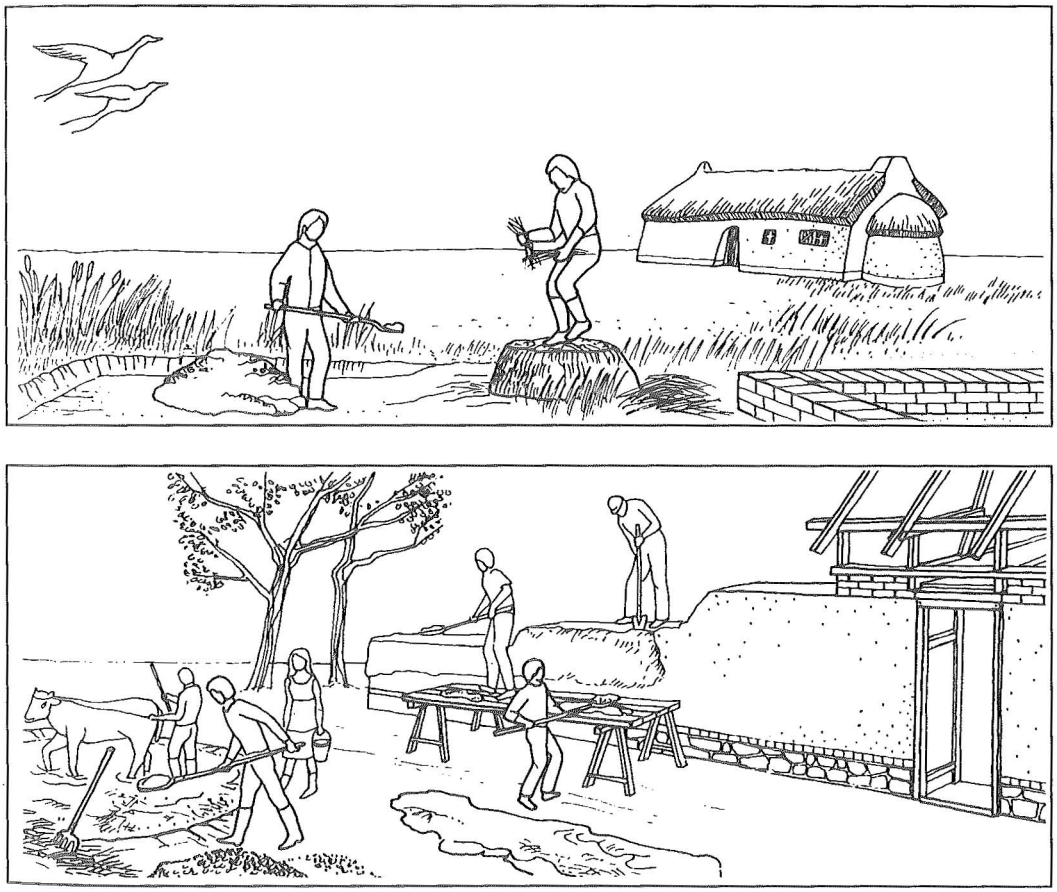


Fig. 16.8 Diagram of cob puddling and wall building (Houben, Hugo, and Hubert Guillaud. 1994. *Earth Construction: A Comprehensive Guide*. London: Intermediate Technology: fig. 179).

however, attribute the technique to foreign practice, particularly to Africa, Spain, and Magna Grecia (cf. Teichner, Oberhofer, and Kopf 2014; Russell and Fentress 2016).

More recent work is beginning to make a case for the ubiquity of pisé in Roman Italy, particularly, although not exclusively, in rural contexts. The excavations at Settefinestre were among the first to make particular note of the technique in rural central Italy (Carandini 1985a:119; Regoli 1985:64–66), and it has subsequently been identified in many urban and rural constructions on the peninsula. Most of the known peasant houses from central Italy are said to use it (see Ch. 5), as do urban houses in Cosa and Fregellae, and, while often glossed over, the outbuildings of many, if not most, rural villas throughout Italy (Rossiter 1978:10–15; Bacchetta 2003:127–137; Pasquinucci and Menchelli 2005; Russell and Fentress 2016). It should be noted that, in the majority of the above cases, the material could be cob rather than pisé, as the sparse remains of the superstructures do not permit distinction. While the archaeological record is still too poor to provide proof, it is entirely possible that some style of earth-atop-socle construction was the most ubiquitous wall technology in rural Roman Italy (cf. Russell and Fentress 2016:139).

Mortar was not typically used in the structures we excavated and its presence was usually reserved for structures of specific function. The cistern at Pievina Phase 1 had mortared walls and hydraulic *opus signinum* fragments were found in adjacent contexts (see Ch. 4). The rest of the buildings of this phase (Structures 2–3, granary and kiln, respectively) were made without mortar: its use in the cistern was clearly dictated by the water-carrying function of the structure. Similarly, the tank and foot press at Case Nuove Phase 1.1 both had mortared walls and were covered with *opus signinum*. Other components of the press

apparatus, like the press itself, were seemingly built of stone and wood components, the mortar again being reserved for liquid-bearing elements.

The case of Marzuolo is particularly instructive not only because it was the largest and materially richest site excavated by the project, but also because it combines the stone socle-earthen forms with other variants. The construction techniques in Areas I, II, and III differed: Area I included a building in a rough or quasi-*opus reticulatum* (Structure 2)—a technique of cut, diamond-shaped stones laid lengthwise in two faces and bound by hard white mortar (see Figs. 10.27 and 10.28). This style is common in late Republican and early imperial buildings in cities and elite villas but more rarely found outside those contexts. In our region, the earliest occurrences of true *opus reticulatum* date to the Julio-Claudian period, as at Roselle in the amphitheater and at the nearby villa of Santa Marta (Duvernoy and Poggesi 1998; E. Vaccaro, pers. comm.), while some rougher or quasi-*reticulatum* may date to the 1st c. BC (Nicosia and Poggesi 1998:195, 203). While the function of this *opus reticulatum* building remains unclear, its construction style alone made it a building that carried particular prestige.

The fragmentary walls of Structure 3 in Area II and Structure 4 in Area III, on the other hand, while on the same alignment as Area I, were stone socles of the common type, but in this case bound with small quantities of mortar. The functional and chronological contexts for these three areas still remains somewhat unclear, although we have assumed Structures 3 and 4 to be more or less contemporary and the *opus reticulatum* Structure 2 to have been later. Ongoing excavations on the site (Van Oyen and Venarrucci 2017) may clarify the functional difference and why different construction techniques were employed.

Most of the roofed structures excavated by the project had ceramic tile roofs. Tile roof collapses were found at Marzuolo Phase 1 and Poggio dell'Amore, while significant tile was reused in the yard near Podere Terrato and we have assumed that it, too, bore a tile roof. While the roofing solution to the granary (Structure 2) at Pievina Phase 1 was unclear, the adjacent contemporary kiln may have produced tiles for its roof. At San Martino, the absence of a clear tile collapse led us to reconstruct the roof in straw (see Fig. 6.12), but subsequent analysis of the tile fragments in stratified contexts suggested a much higher presence of roof tiles on the site than we had thought, and a possible, if not probable, tile roof (see Table 6.4). The most likely straw roof we located at Pievina Phase 2, the stone-built portion of the Structure 4 house, was covered by a clear tile roof collapse which terminated at the interface with the post-built extension. We reconstructed this as a mixed roof, half in tile (over the stone-built portion) and half in straw (over the added post-built portion) (see Fig. 4.11).

It is rarely possible to reconstruct the pitch of these roofs with any certainty. At San Martino, a narrow gravel drip edge was found abutting the S wall (Fig. 16.9), leading us to reconstruct a single-pitch roof angled to the S and leaving the northern doorway sheltered. Given its small size and span and absent evidence of internal supports for a central ridge, we assume that Poggio dell'Amore had a single pitch. Pievina Structure 4 with its post built extension and half-tile, half-straw roof, we have reconstructed with two pitches (see Fig. 4.11) and Podere Terrato with its room and porch may have had a similar solution.

The construction of the stone field drains was somewhat different than the stone-socled, load-bearing walls of buildings. The drains at Pievina, Colle Massari, and Podere Terrato were all constructed in approximately the same way: a somewhat deeper (20–30 cm) foundation trench was excavated and then backfilled with a loose assemblage of stones, generally smaller (ca. 10–15 cm) than those used in stone socle construction (see Figs. 4.13, 8.6, and 9.7, respectively). At Colle Massari and Podere Terrato these stone drains were simply loose assemblages. At Pievina, rough "walls" of the drain were composed by laying a line of stones along the side of the cut and then heaping cobbles atop these. The result in all cases was a very loose structure with numerous air pockets: this would have allowed the drain to act as filter for debris-filled runoff entering the drain from above, while using the base of the drain as a channel to carry that run-off away from the site. According to conversations with local farmers, these types of filter-drains were built until recently in Tuscany and are termed "*draino/draini*" in the Tuscan dialect and might also serve as property and field boundaries.

The predominant use of stone and earth as building materials is as notable as the limited presence of wood. A post-built structure was attached to Structure 4 of Pievina Phase 2, with its interstices seemingly filled by cob or pisé. Wood posts anchored and

Fig. 16.9 San Martino, detail of drip edge (SU 4030).

supported the primitive press at Case Nuove Phase 1.1 (see Fig. 5.18, reconstruction) and possible post holes of uncertain function were present outside Poggio dell'Amore and in the yard in front of Structure 4 at Marzuolo (see Figs. 7.5 and 10.37, respectively). A wooden post may have served as a buttress repair at San Martino (see Fig. 6.12, reconstruction) and the seemingly portable forms for pisé construction would have been made in wood. Altogether, these wooden elements are few and, with the exception of Pievina, mostly reserved for installations and mechanicals, rather than building elements. This stands in sharp contrast with the one medieval structure excavated by the project, Colle Massari Medievale (Bowes, Vaccaro et al. forthcoming): an approximately 4 m long structure built atop a structured earthen terrace and protected by a drain. This small building was not unlike Poggio dell'Amore in its dimensions, however, it was seemingly entirely constructed of wood, of which only the beam slots remained.

Far from being foreign, primitive, or barbaric, the techniques and materials of the project's buildings are broadly shared with Roman Italian buildings of all kinds. The ubiquity of pisé buildings in all kinds of structures throughout Roman Italy suggests that in rural contexts pisé was as common as mortared construction and that mortar should not be regarded as a requisite Roman cultural marker, even in Italy. The near ubiquity of stone socles as the base of walls and tiles on roofs indicate a use of the most fundamental of Roman building materials. These fundamentals are absent or diminished in Iron Age and medieval architecture before and after the Roman period. Roman peasant architecture, in short, is Roman architecture and shares its propensity for solidity and a certain monumentality.

16.2 Recycling

New work on the Greek and Roman worlds have described a world of ubiquitous recycling, in city and country and among poor and wealthy alike. The surface scatters of Greek farmsteads, it has been suggested, were heavily impacted by ancient recycling habits: textual and archaeological studies have documented the movement of stones, tiles, wood, and other structural features from old house to new (Pettegrew

2001, 2006). While still in its infancy, studies of recycling in the Roman world points to an even more systematic and comprehensive cultural *habitus*. Ceramics, weaving implements, even jewelry might all be reused and/or repaired as need arose, and a phenomenon once assumed to be restricted to late antiquity (cf. Lavan and Mulryan 2013) is increasingly documented throughout the Roman period (Swift 2013; Peña 2007). Building materials—particularly tiles but also ceramics and building stones—were reused in a systematic fashion, materials being separated by size/function and sold to middlemen or directly to the new user (Peña 2007:250–271; Mills 2013; Dicus 2014).

As part of the effort to study as many aspects of peasant material culture as possible, all of the building stones used at RPP sites were studied and sourced to their nearest outcrop (see Ch. 2). Surface outcrops are relatively rare in this region (see Ch. 3), and, thus, readily available building stone was and remains at something of a premium. Because the collection of building stones represented a certain effort, the source of those stones is potentially revealing not only of construction methods, but also of mobility patterns, time investment priorities, and, as it turns out, ancient recycling. Table 16.1 summarizes each site's building stone geological profile, noting the number of different geological types of stone and the range of distances at which such stone might be obtained. Figure 16.10 maps sites and the nearest geological source for their respective building stones

The data suggest a number of trends. Certain kinds of sites on the sporadic end of the temporal habitation spectrum tend to be constructed with stones from a great number of origins than more permanent ones (Fig. 16.11), although this trend is not pronounced. Thus, temporary roofed structures like Poggio dell'Amore and San Martino are built of 4 or even 9 stone types, while Marzuolo Phase 1 and 2 and Pievina Phase 2, Structure 4 contain only 1–3 stone types. The exceptions to this trend are the granary at Pievina Phase 1 (6 types) and the strange tiled pavement at Tombarelle Phase 3 (5 types), both of which appear to be agro-industrial structures.

The relationship between distances to geological sources and the temporal spectrum of habitation is more pronounced. In general, the more permanent the site, the greater the distance to the most geologically distant stone type (Fig. 16.12), while more

Table 16.1 Geologically distinct building stones from project sites, quantities and distance (KB).

Sites/Structures	Number of geologically distinct building stones	Minimum distance to furthest geological source (km)
Pievina Phase 1 (Structures 1–3)	6	12
Pievina Phase 2 (Structure 4)	1	10
Case Nuove Phase 1.1 (well)	2	6.5
Case Nuove Phase 1.2	N/A	N/A
Case Nuove Phase 2 (square pit)	1	6.5
San Martino	9	7
Poggio dell'Amore (single wall)	4	6
Colle Massari Romano	2	6
Podere Terrato	4	8
Marzuolo Phase 1 (Structures 1–3)	3	8
Marzuolo Phase 2	N/A	N/A
Marzuolo Phase 3	N/A	N/A
Tombarelle Phase 1 (cistern)	3	15
Tombarelle Phase 2	N/A	N/A
Tombarelle Phase 3	5	15

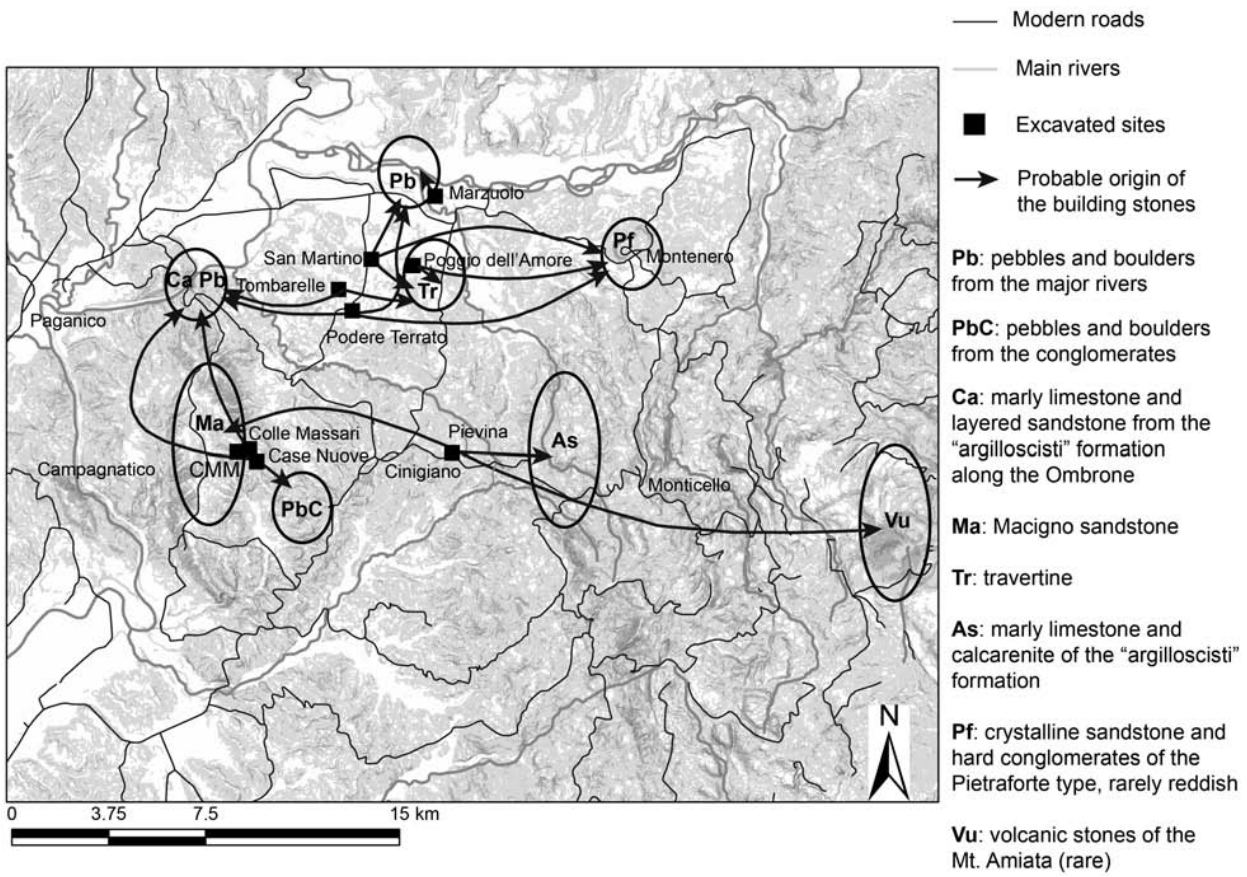


Fig. 16.10 Map of project sites and the location of their respective building stones (AA/ERZ).

sporadic sites tend to use more proximate sources of stone. The data from Marzuolo is somewhat misleading here as the vast majority of the stones from the Phase 1 *opus reticulatum* Area II and III structures probably come from the adjacent Orcia or Ribusieri Rivers. It is the much less frequent Montenero and "macigno" sandstones some 6–8 km away that produce the higher distance number.

But why should buildings of any kind or duration of use utilize more than one stone type? Why should builders seemingly travel such great distances to quarry what was often only a few stones from a given outcrop? Almost certainly the builders of these structures are not doing this, and the data instead represents other activities. One possibility is that movement to these distant areas took place for other reasons such as working distant fields, trade and exchange trips, family visits, etc. Given the difficulty of obtaining good building stones in this area, builders picked up examples of stone wherever they encountered it, carrying them back to wherever their potential project lay, and gradually assembling a sufficiency of stone (cf. Ch. 17, below).

Perhaps even more likely is that the variety of stones represents a palimpsest of recycling activities. As actually witnessed at Poggio dell'Amore, where the majority of the stone socles were removed in antiquity, stone structures were disassembled presumably for reuse of their building stones, roof tiles, and other materials. As was true at Poggio dell'Amore where only three of the four walls were recycled, it was probably most often the case that building stones were rarely recycled in a single moment, but rather piecemeal, to build new structures of different dimensions and requirements. In this way, what may have originated as a homogeneous collection of building stones became variegated via the admixture of stones from different earlier structures, resulting in a palimpsest of stones from different geological origins.

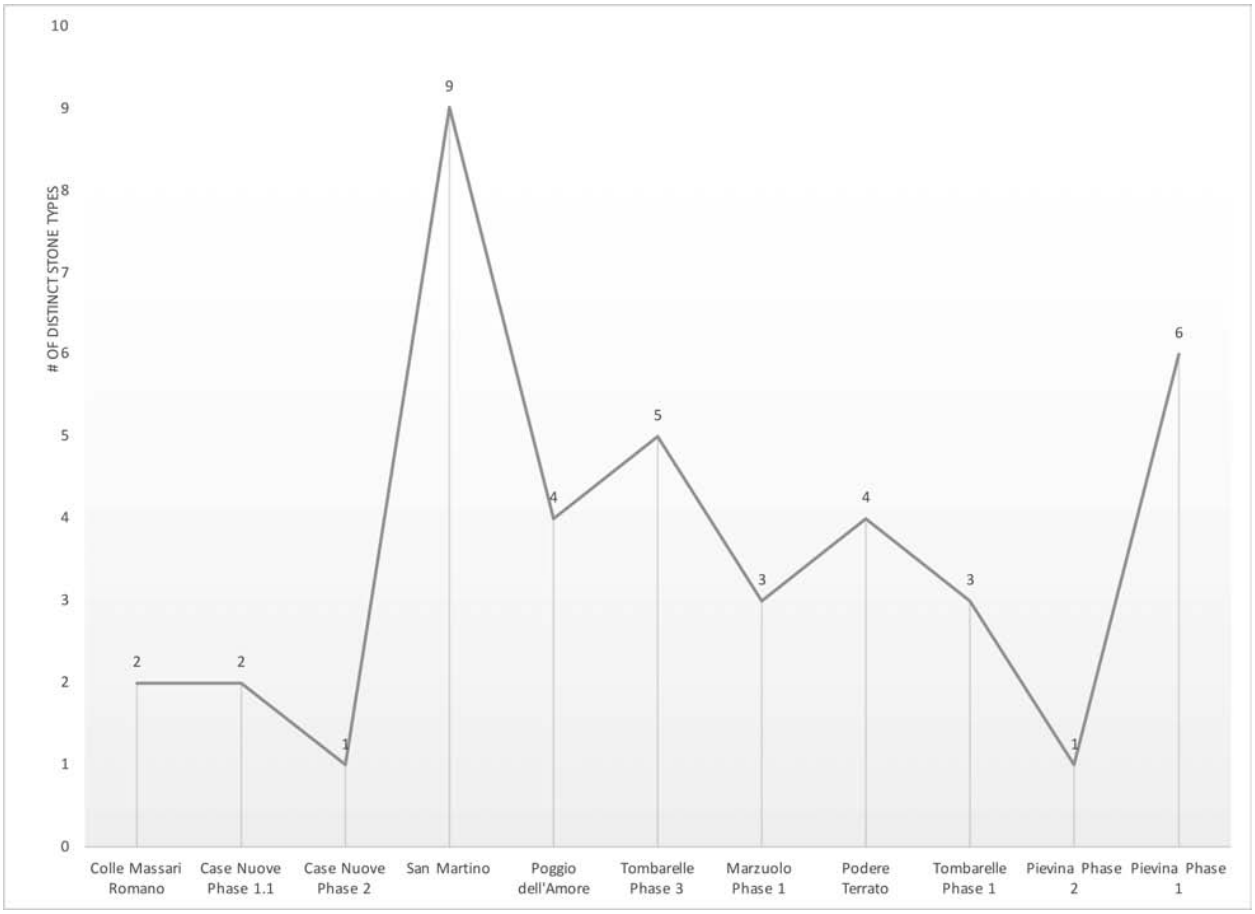


Fig. 16.11 Number of geologically distinct types of building stones used in sites along the spectrum of habitation (KB).

Assuming that a high degree of mobility and/or recycling is responsible for the heterogeneity of building stones in some structures, it is important to note in which sites such activity is concentrated. Some of those sites on the more sporadic end of the temporal habitation spectrum tend to be built with a greater variety of stones, but from nearby sources. These work huts, stables, and other short-use sites were more likely to be constructed via recycling of earlier structures or the gradual accumulation of stones via other journeys. This seems to have also been true of some buildings of agro-industrial function, like Pievina's granary or Tombarelle's paved area. Structures intended for longer-term use like Pievina Structure 4 or Marzuolo were built from more homogeneous collections of stones, presumably purposely collected at a single moment from one source, often quite distant from the site.

These observations gives us some insight into the planning arc for sites of different function, which seem to have varied even while the construction technique may have been identical. The construction of longer-term use structures was done with a greater degree of deliberateness and initial investment, while that of sporadically used buildings was more ad hoc and may have taken longer to complete as stones were accumulated via chance encounters with earlier structures or occasional outcrops.

In addition to building stones, roof tiles were demonstrably recycled in project buildings. Poggio dell'Amore is our best evidence for this: here the whole roof was removed and only a line of fragments, broken either during the recycling process or earlier, remained. We recognized the same in retrospect at San Martino where 17.5 kg of 326 tile fragments were recovered from the site (see Table 6.4), leading us to

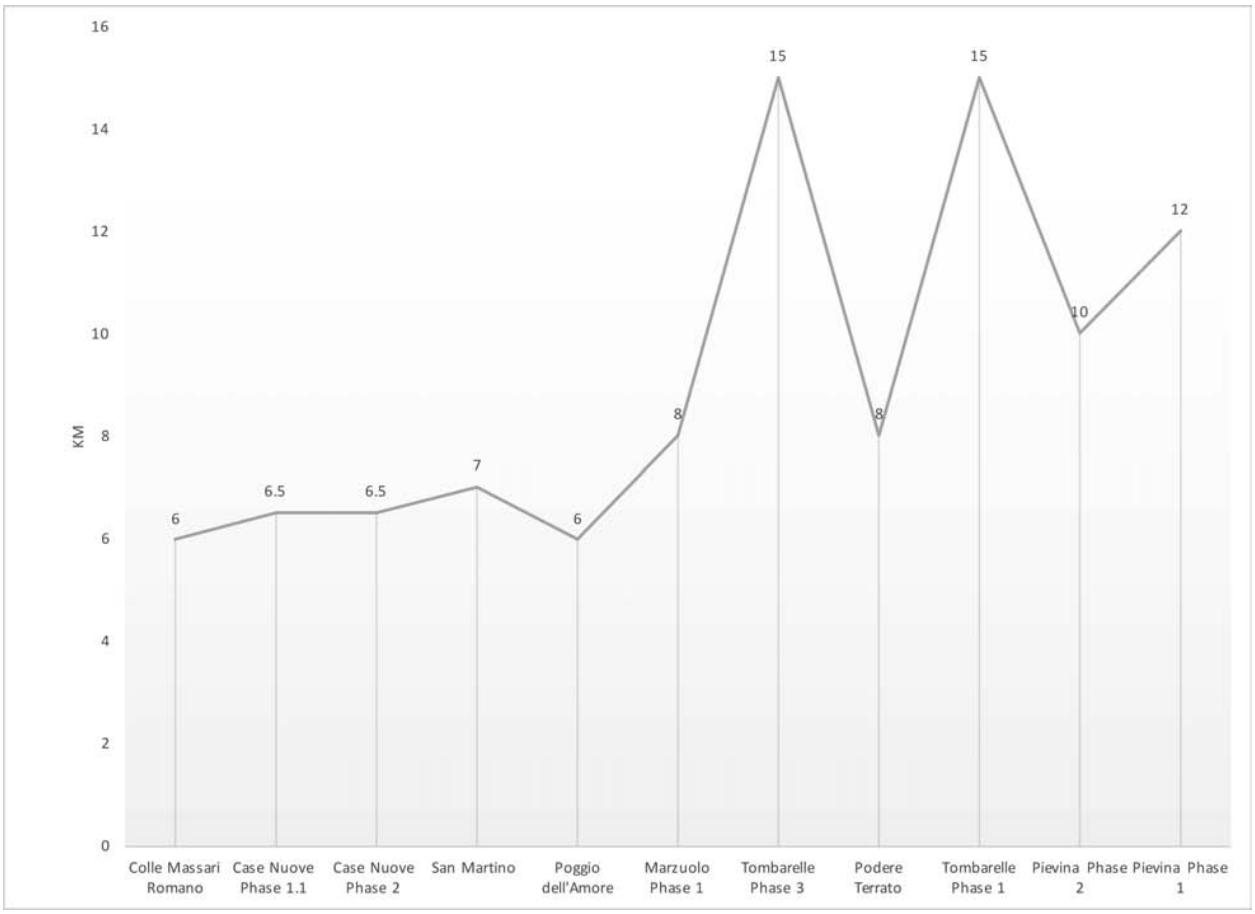


Fig. 16.12 Distance to furthest geological source for building stone in sites along the spectrum of habitation (KB).

rethink our initial assumption about a straw roof and postulating instead an original tiled roof, which had been recycled, leaving only broken remnants. In both cases, whole tiles were completely removed from the site (Pettegrew 2001, 2002; cf. Bintliff et al. 2002:260).

The recycling habit has a potentially important impact on the archaeological record. A tendency to recycle not only building stone, but also roof tiles, metal, and other objects reduced or removed them from what Schiffer (1972, 1996) has termed the "systemic context" and, thus, reduced their presence in the archaeological context. As a consequence, that record preserves only imperfectly the material culture of the site's use period and may further distort the data for certain materials more than others. At Poggio dell'Amore, we were fortunate enough to find a site partially recycled, whose obvious roof tile recycling detritus led us to rethink the seeming lack of a tile roof at San Martino. When we reexamined the fragmentary remnants of tiles at that site, we were able to reconstruct a probable original tile roof, again recycled after abandonment.

It is harder to reconstruct the impact of metal recycling. We have noted in earlier chapters the almost total absence of agricultural tools at our sites, as well as particular patterns of coin loss that point to careful conservation and reuse. Instances of more catastrophic destruction such as that at Marzuolo Phase 2, where metal objects might be lost without the opportunity for recovery, present a picture of a more metal-rich world, with a wide variety of tools from anvils to buckets that are totally absent from most of our sites.

Nails make a particularly interesting case: nails are present in consistent numbers in more permanent sites but almost wholly absent from sites on the

sporadic end of the spectrum (Table 16.2). The exceptions to this rule are production sites like Marzuolo Phase 2 or Case Nuove, which have high nail counts. Case Nuove had no roofed structures and, thus, nails there must have derived from agricultural production equipment. Likewise, the ceramic production phase at Marzuolo Phase 2 produced exponentially more nails than any other site and was the only site (together with its Phase 4, the medieval phase) to have produced copper alloy nails (Table 16.3). In general, however, despite having roofed structures that might have used nails, the other sites on the sporadic end of the spectrum (Colle Massari Romano, San Martino, Poggio dell'Amore, Podere Terrato) yielded virtually no nails. More rigorous recycling of these sites, as well as a paucity of nail-bearing furniture and other items probably accounted for this. Metal recycling was potentially significant, particularly on sites at the more sporadic end of the habitation spectrum, and probably had a dramatic, if differential, effect on the archaeological record.

Table 16.2 Presence of iron nails from project sites, organized by weight (g) (SCE).

Sites	Weight (g)	Number[a]	MNI
Colle Massari Romano	0	0	0
Poggio dell'Amore (single wall)	5	1	1
Tombarelle Phase 3	11	1	1
Podere Terrato	13	3	2
Tombarelle Phase 2	19	1	1
San Martino	30	3	3
Case Nuove Phase 1.1 (well)	50	6	3
Marzuolo Phase 1 (Structures 1–3)	78	6	6
Pievina Phase 1 (Structures 1–3)	109	9	6
Tombarelle Phase 1 (cistern)	156	10	10
Case Nuove Phase 1.2	182	17	16
Case Nuove Phase 2 (square pit)	243	22	15
Pievina Phase 2 (Structure 4)	441	45	31
Marzuolo Phase 3	473	38	34
Marzuolo Phase 2	4153	169	144
TOPSOIL CONTEXTS			
Case Nuove Topsoil	6	2	2
Tombarelle Topsoil	49	2	2
Marzuolo Topsoil	514	25	22
Marzuolo Phase 4	91	4	4

[a] fragments+intact pieces

16.3 Negative Space: Installations and Yards

In addition to adding a new perspective on the Roman built environment, the project deliberately structured its excavations to examine the empty space around buildings. Yards, basins, drains, and other "negative" space outside buildings were, as noted in Chapter 12, an important part of peasant architecture. The proximate exterior seemed to be a kind of "third space," a natural extension of the interior and the area where certain kinds of activities, particularly water storage, was concentrated. We wanted to understand more about these "negative" spaces so extended our excavations 5–10 m or more outside the built structures to capture some of these activity areas.

Perhaps the most prominent component of this exterior space were arrangements for drainage, particularly, if not exclusively, in sites on the more permanent end of the spectrum. Drains were found outside Pievina Phase 2, Structure 4 and Podere Terrato, although in the former case, the distance between structure and drain may indicate a field drain rather than a domestic drain (see Figs. 4.9 and 9.5). At Pievina, the drain was Y-shaped, seemingly carrying runoff from two different waterlogged areas to the N of the structure, near the former cistern, around the E side of Structure 4. As both sites were on slopes and set near subsurface water sources, water would have been both a blessing and a curse and needed to be managed accordingly.

Again at Pievina and Podere Terrato, the exterior yards outside the buildings were covered with a combination of beaten earth and broken ceramics, producing a kind of water-resistant surface (Figs. 16.13 and 16.14). At Area II in Marzuolo, an area seemingly between two ranges of buildings

Table 16.3 Presence of copper alloy nails from project sites (SCE).

Sites	Weight (g)	Number[a]	MNI
Marzuolo Phase 2	115	6	6
MarzuoloPhase 4	17	1	1
Marzuolo Topsoil	15	1	1

[a] fragments+intact pieces

was provided with a rough cobbled surface (see Fig. 10.36). These water-shedding yards were likewise intended to keep the exterior areas from becoming mud pits. It is likewise important to note the absence of such provisions at the sites on the more sporadic end of the spectrum. The structures at San Martino, Poggio dell'Amore, and Case Nuove were all surrounded by unmodified earthen spaces. Presumably because they were not intended for frequent, heavy use, no effort was made to prepare these surfaces for water and wear.

As discovered at previously excavated sites like Podere Tartuchino, Monte Forco, Podere S. Mario, and Luni (see Ch. 12), these exterior yards were also the principal site for various types of permanent installations. A possible seat for a jar and a possible dolia or hearth were found outside the E wall of Poggio dell'Amore and outside the N wall of Structure 4 of Marzuolo Phase 1 (see Figs. 7.4 and 10.38); hearths were found in the exterior yards of Pievina Phase 1 and possibly at Marzuolo Phase 2 in the ceramic production area (see Figs. 4.6 and 10.12). Cooking and water storage seem to be activities that took place outside.

The absence of certain kinds of installations we might expect to find in these negative spaces is also important. Unlike much of the earlier corpus of peasant buildings and with the exception of Case Nuove, we found no wells near our sites. The prevalence of near-ground subsurface water may account for this, particularly the presence of so-called *fontone* or small pools, near many of our sites. Animal pens or fences were likewise absent, even as post-built structures

Fig. 16.13 Pievina, beaten earth surface (SU 1538) from Phase 2.

Fig. 16.14 Podere Terrato, detail of beaten earth surface in "yard" (SU 8004, 8007, 8010, 8026).

near the more permanent structures, despite faunal evidence for small, closely managed herds. At Pievina, it will be remembered, we hypothesized that the Phase 2 built extension may have housed animals in the house itself.

Finally, and perhaps most importantly, only Marzuolo Phase 1 and Pievina Phase 2 produced any domestic rubbish tips. The Phase 1 and 3 tips at Tombarelle were both purposeful efforts to fill voids, rather than regular domestic rubbish, while Case Nuove Phase 1 was mostly a construction dump and the trash in the tank during Phase 1.2 seems to have been an abandonment. This relative paucity of nearby rubbish tips is consistent both with what we have observed about recycling and with what little we know about Roman practice more generally. Given the efforts to recycle materials, we should expect little in the way of permanently discarded trash, particularly near sites on the sporadic end of the spectrum. Indeed, those tips we have tend to appear in more permanent sites or are a mixture of domestic and ceramic production detritus. Recent work on trash management in Roman urban sites has suggested that only very rarely was domestic rubbish trash simply left lying near living quarters. Rather, it was characteristically recycled, in whole or part, or removed to disposal areas outside the city walls (Dicus 2014). The paucity of dumps reported from excavations of Roman rural villas is likewise important, while at the peasant houses of Poggio Grillo and (perhaps) Monte Forco, rubbish tips were found some distance from the main house (Gadd 1986; Barbieri 2005b). Roman habit among rich and poor, urban and rural, seems to have seen waste transported away from living spaces.

This habit is said to have broken down in late antiquity, when some sites have large middens accumulating near houses and in streets and what appears to be a general change in the management of waste (e.g., Freed 1983; Wilkinson 1995; Gering 2013:272–273; Cossalter and Depalo 2017). While this hypothesis may be supported by the large trash tip in Pievina Phase 2, it must be remembered that the "house" (Structure 4) was abandoned prior to the formation of this dump. Thus, the data from this project is insufficient to support or deny this claim.

16.4 Permanence and Friability

The architecture of Roman peasants as revealed by the project is considerably more substantial than has sometimes been imagined (cf. Pettegrew 2001; Rathbone 2008; Witcher 2011). Not only are all buildings from temporary work huts to agro-industrial buildings to habitations in part built of stone, but, in many cases, this stone-pisé mixed technique seems capable of lasting for a considerable length of time (cf. Francovich, Gelichi, and Parenti 1980:213–216). Structure 3 at Marzuolo remained in use for around 300 years and even San Martino may have been in use for 50–75 years. Both of these longer-life buildings were repaired during their use period: the E wall of Marzuolo Structure 3 show signs of a major repair, while the W wall of San Martino was buttressed.

Except for the *opus reticulatum* structure at Marzuolo and the pressing equipment at Case Nuove, the other structures excavated by the project were built with stone socles and pisé techniques and all seem capable of theoretically long use periods. As has been noted throughout this book, however, most of these structures were actually used for a relatively short period. Table 16.4 summarizes the estimated total use life of the structures excavated by the project based on ceramic dates. The average use period is estimated at about 44 years for all sites with a range of 30–100 years. Even within longer phases, the actual use may be shorter as less finely grained ceramic chronologies, like those for black glazed ware, de facto produce longer potential ranges.

In part, this seeming disparity can be explained by certain properties of earthen construction. In non-desert climates, cob or pisé construction is durable only as long as it is kept dry, that is, its exterior surface is renewed and the roof protecting it is maintained. As soon as maintenance on the wall surface or roof ceases, the mudpack of the walls essentially melts (Centre de recherche et d'application - Terre 1979:28). In other words, the theoretical long use life of these structures, which can extend to centuries, is conditioned in reality by maintenance patterns that clearly varied enormously and/or were absent. On

Table 16.4 Duration of use for project sites (KB).

Sites/Phases	Duration of use (maximum)	Duration of use (minimum)	Most likely duration of use (years)
Pievina Phase 1	2nd c. BC to late 1st c. BC	late 1st c. BC to late 1st c. AD	100
Pievina Phase 2	early 4th c. AD to early 5th c. AD	early 5th c. AD	50
Case Nuove Phase 1.1	mid- to late 1st c. BC	mid- to late 1st c. BC	30
Case Nuove Phase 1.2	10–40 AD	10–40 AD	30
Case Nuove Phase 2	late 4th to mid-5th c. AD	early to mid-5th c. AD	30
San Martino	2nd c. BC to late 1st c. BC	mid-1st c. BC	50
Poggio dell'Amore	late 1st c. BC to mid-1st c. AD	50–70 AD	30
Colle Massari Romano	50 BC to 2nd c. AD	10 BC–40 AD	50
Podere Terrato	9 BC–55 AD	0–40 AD	40
Marzuolo Phase 1	30–10 BC	30–10 BC	20
Marzuolo Phase 2	50–70 AD	50–70 AD	20
Marzuolo Phase 3	late 2nd to early 4th c. AD	late 2nd to early 3rd c. AD	100
Tombarelle Phase 1	40–10 BC	40–10 BC	30
Tombarelle Phase 2	10 BC–40 AD	10–40 AD	30
Tombarelle Phase 3 (mid-5th c. AD) (17000s)	3rd c. AD to third-quarter of 5th c. AD	early to third quarter of 5th c. AD	50
AVERAGE USE (years)			**44**

the other hand, earthen walls are easily and readily repaired, as witnessed at San Martino and Marzuolo (Matero 2012).

The disparity between relatively robust construction and short use life should also be seen as part of a general cultural pattern of building investment. Roman rural buildings in Italy, no matter their intended use or length of occupation, seemingly were simply built in this way. In specific circumstances, particularly in hydraulically oriented structures, mortar might be added, but otherwise peasants drew on a limited, if robust, palette of materials and techniques. Using more friable and potentially easier, less time-consuming techniques—such as post-built structures or omitting the stone socle or even the use of straw instead of tile roofs—seemingly was not a cultural option. Of course, these other options may not have been easier or cheaper. Straw and wood construction each require their own specialist expertise (e.g., Hodges, Buckley, and Sennis 1994; Ulrich 2007). Major forests for wooden materials, as shown above, were not widely present in the area. Building stone was a relatively scarce resource, but was collected, sometimes at great distances, nonetheless. In short, the consistent investment in potentially long-lived, short-use, stone-earth architecture described by the project seems evidence of a strong cultural habit.

It should be emphasized that this tendency to invest in temporary architecture, seemingly above and beyond the occasional use to which the buildings are put, is not limited to the Roman world. Other Mediterranean cultures/periods exhibit similar habits, habits that seem particularly associated with moments of agricultural change/expansion. The Provançal *bories*, for instance, are extraordinary monuments of dry-stone construction and include whole seasonal villages of small "houses," animal stalls, beehives, and threshing structures, many of which are covered in corbel vaulting. Yet they were used only for the summer months by peasants whose "homes" remained in their nearby villages (Specklin 1976:270). While presumed to have neolithic origins, most *bories* date from the 17th c., and above all the 19th c., moments of massive land clearance episodes and the expansion of agriculture into more liminal areas but with ever lower peasant populations to manage the expanding territory (Mansuy Chevalier-Drevon 1994). Less grand are the Greek *kalivia* or field houses, which in the late 17th to 18th century may have even agglomerated into *sevgolatia*, or seasonal villages. The remains of these small, single-story, stone structures continue to dot many Greek landscapes and were originally used as threshing, stalling, and, in the 19th to 20th c., as wine-pressing points, as well as offering shelter for a few nights' stay. Like the *bories*, the *kalivia/sevgolatia* were used to extend the range of village-based peasants, allowing them to effectively work distant plots (Forbes 2007). In the Venetian, Turkish, and immediate post-Independence period, their use seems associated with low populations managing a largely pastoral agriculture over large, often distant land areas worked with slow oxen (Clarke 2000; Forbes 2000b). The best-known impermanent structures, perhaps, are pastoral structures built by shepherds in Mediterranean mountain environments. These shepherds usually had village bases, but spent various periods moving flocks either in vertical transhumance or around a disparate network of pastures (Barker and Grant 1991). Pastoral communities of the sub-Alpine and Apennine valleys had long used a network of temporary sites to house animals as they moved between mountain pastures. While Roman and medieval huts and pens have been found (Barker and Grant 1991; Baker 2007; Sauro et al. 2013; Pani Ermini 2015) the real expansion, monumentalization, and systemization of these structures only occurred after the 15th c. and above all in the 17th c. and later, when the global market in wool produced a massive expansion and intensified use of Italian (and Spanish) mountain pastures (Marino 1988; cf. Rendu 2003).

16.5 Conclusions

The RPP buildings shine a light on a different, but nonetheless still very Roman kind of architecture—temporary in use but more permanent in form, a mixture of stone and earth and tiles. Quantitatively, these kinds of structures would have constituted the most numerous structures in Roman Italy and their use in villas and peasant sites alike describes, as so many other aspects of this project, a shared cultural practice, albeit one with a particularly rural cast.

Rather than being simply places, our buildings are also points on paths that connected the distributed habitation network of activities in landscapes.

McFadyen (2008) has made a case for seeing architecture as a nexus of distributed practice, spaces that come into being through a set of activities—quarrying, post-cutting, tile making, purchasing of tools—that are dispersed in space. Our sites are particularly strong examples of this distributed quality of architecture: the product of both long-distance recycling activities and locally quarried earth, born of and integrated into a network of spatially separated activities. Conceived this way, peasant architecture embodies the particular mode of dwelling that characterized this locale and, perhaps more broadly, the late Republican peasant experience in Roman central Italy.

NOTES:

16.1 Thanks to Frank Matero for his advice on earthen construction and to Lisa Fentress for sharing some important new work on pisé in Italy.

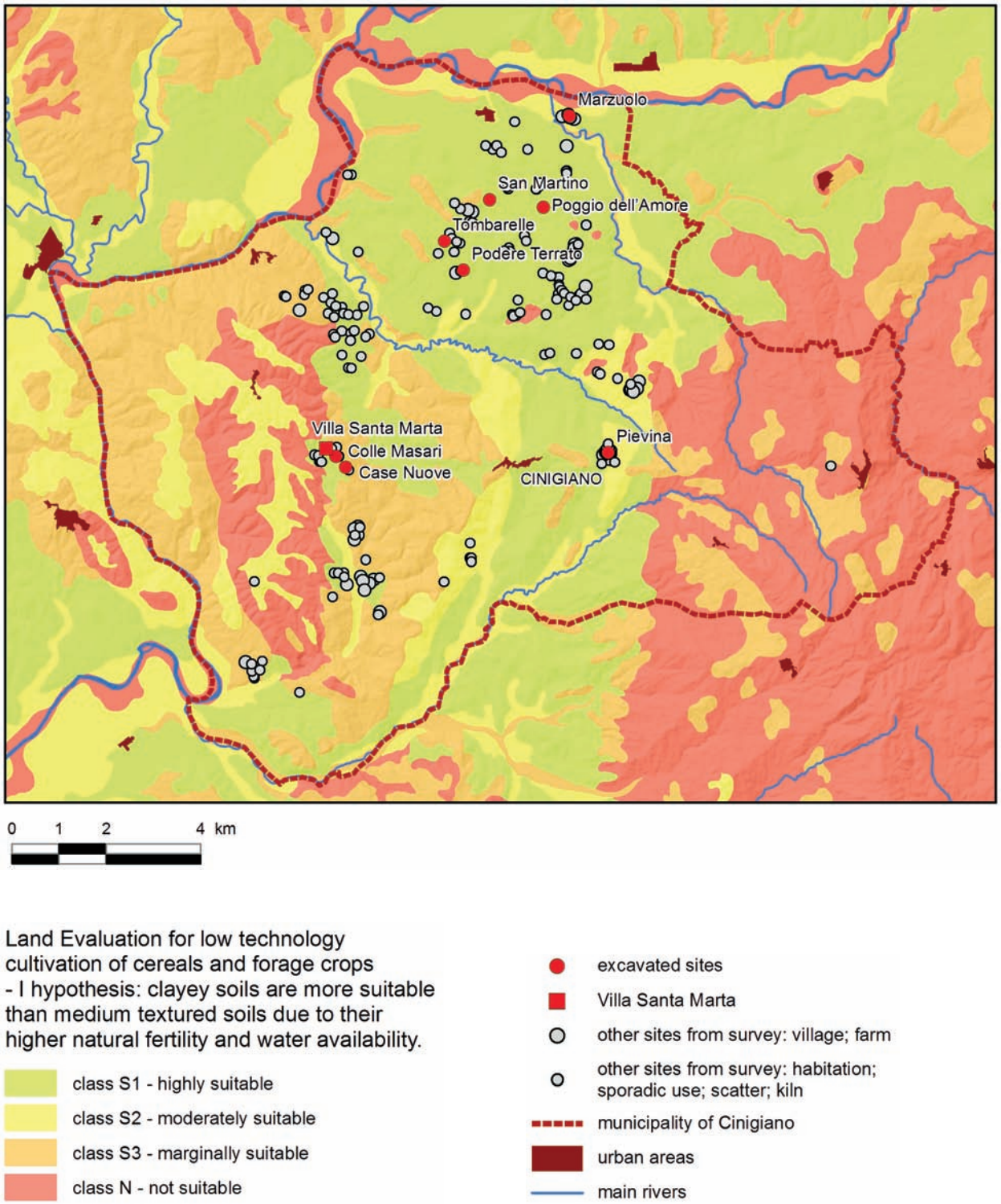


Fig. 13.3 Land evaluation from Hypothesis I, combined with late Republican/early imperial sites from Ghisleni 2010 (AA).

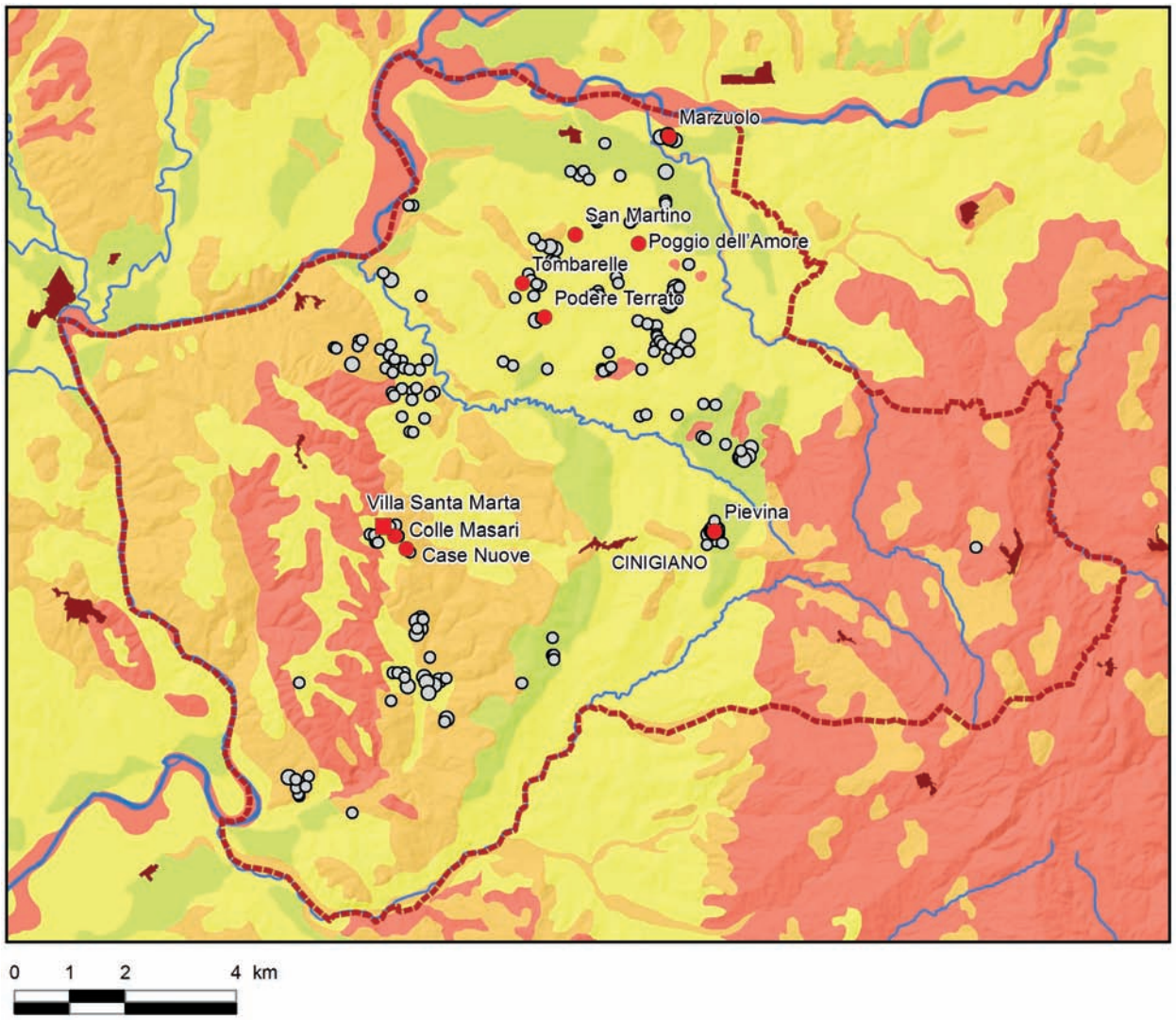


Fig. 13.4 Land evaluation from Hypothesis II, combined with late Republican/early Imperial sites from Ghisleni 2010 (AA).

Fig. 16.4 Pievina, detail of pisé (?) in collapse (SU 1105).

Fig. 16.5 Poggio dell'Amore, detail of pisé (?) in collapse from wall SU 6004.

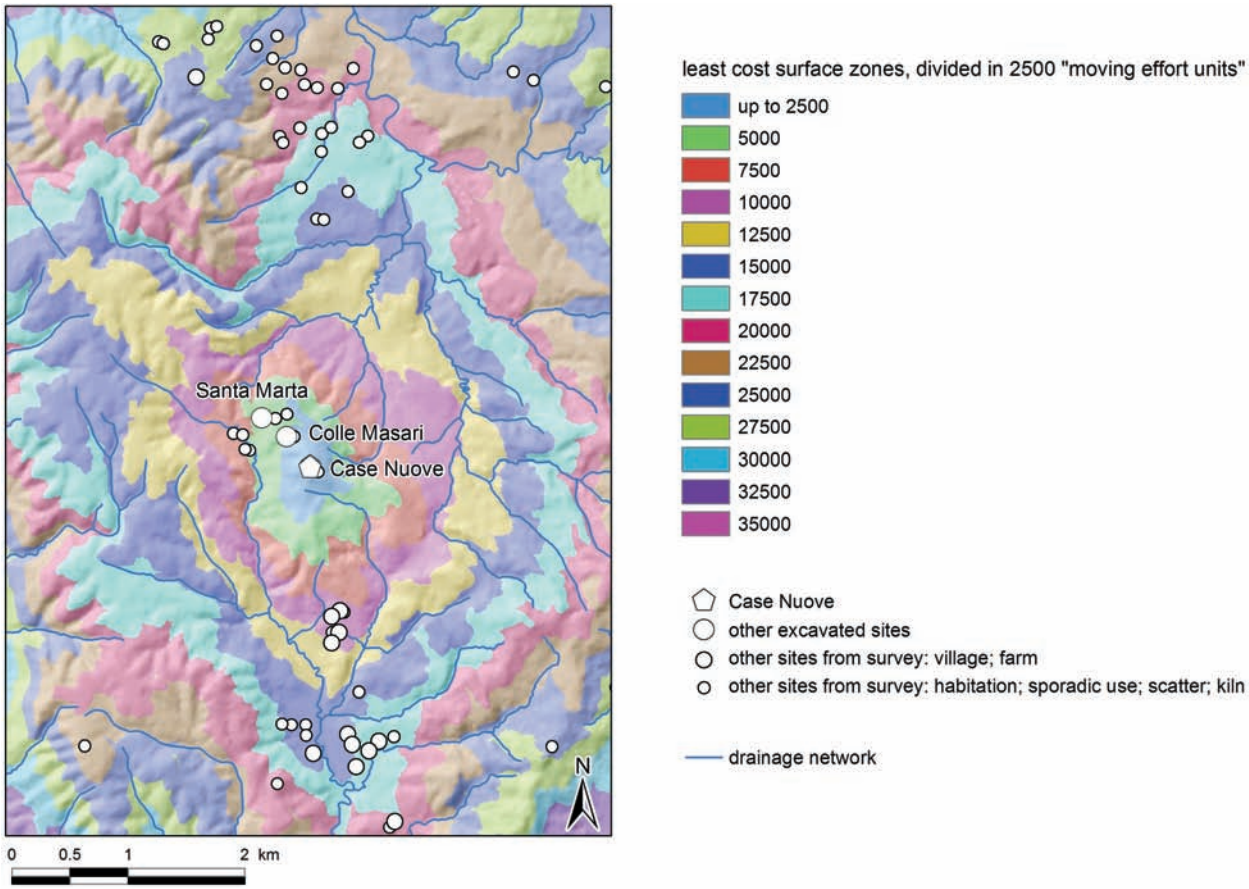


Fig. 17.10 Case Nuove least cost path with cost distance sliced into 2500-size "effort units," and least cost paths (in green). Formula for cost raster: [Cini_slope] * 0.50 + [sm_rivers_sw] * 0.10 + [me_rivers_sw] * 0.15 + [mj_rivers_sw] * 0.25 + [st_valleys_sw] * 0 (AA/ERZ).

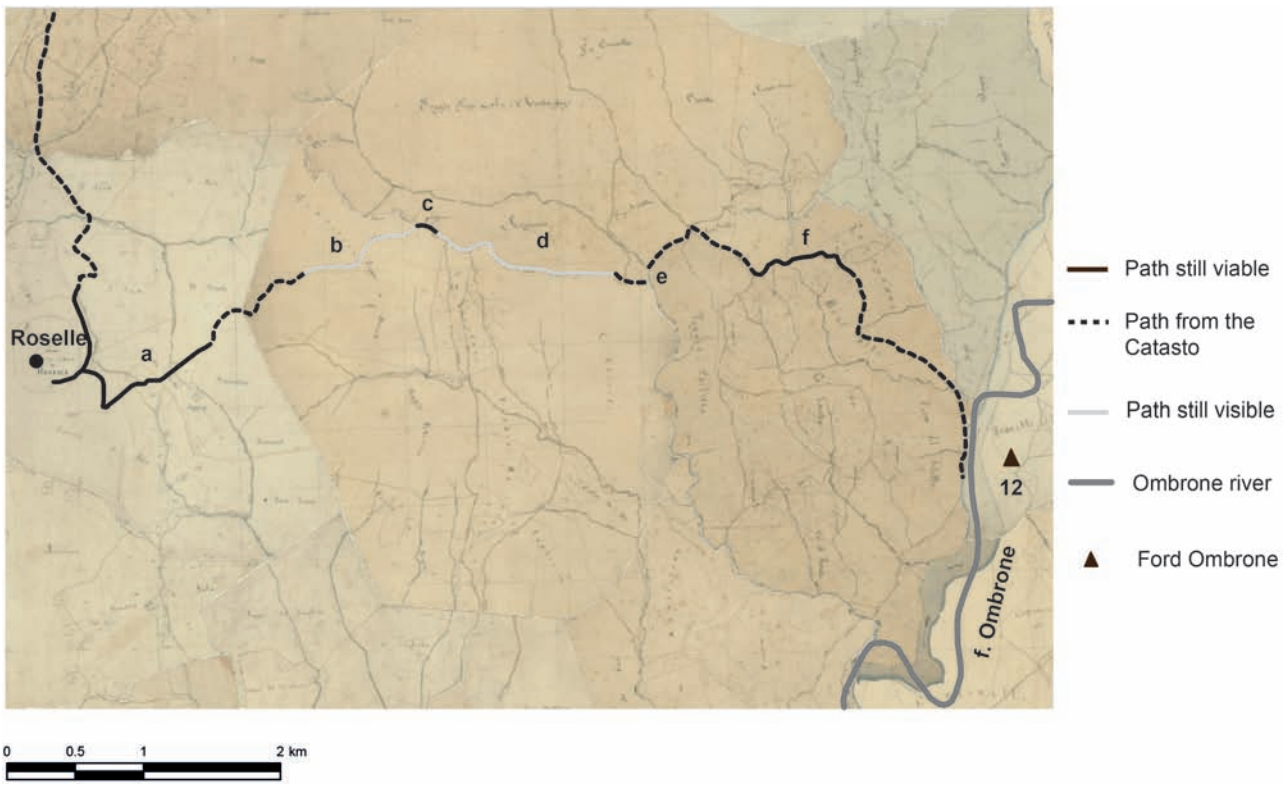


Fig. 17.18 Reconstructed path through the hills between Roselle and the Ombrone River overlain on the Catasto Leopoldino. The fording point is number 12 on Fig. 11 (AA/ERZ).

Fig. A.1 Elementary school archaeology unit, Scuola Primaria di Cinigiano G. Alfieri, 3rd-5th grades, archaeological timeline (MC).

Fig. A.2 Elementary school archaeology unit, Scuola Primaria di Cinigiano G. Alfieri, 3rd-5th grades, archaeological ceramics workshop (MC).

17

Mobility

Cam Grey and Antonia Arnoldus

The economic activities described in the foregoing chapters presuppose movement at a range of scales: from the occasional or episodic arrival of goods for sale from the town of Roselle, through the distribution of ceramics produced at Marzuolo, to regular movement by peasants between habitations, specialized sites, fields, and pastures as part of their daily, weekly, or seasonal economic regimes. In recent scholarship, the various scales at which even supposedly "sedentary" populations move has received increasing attention. In a seminal study of the topic, Robert L. Kelly notes (1992:43): "[M]obility is universal, variable, and multi-dimensional. It is important that we learn to recognize the various forms of mobility archaeologically, because the ways people move exert strong influences on their culture and society." Additionally, scholars have become increasingly sensitive to movement as a fundamental mechanism for the individuals living in a landscape to engage meaningfully with that landscape and, consequently, as a crucial element of that landscape requiring analysis at theoretical and conceptual levels. As Michael Given has recently observed (2013:8), "landscape without movement is inconceivable" (cf. Ingold 2011; Vergunst and Árnason 2012).

Our objectives in exploring movement within, across, and beyond the locale were twofold (Fig. 17.1). First, we wished to access the everyday experiences of living, working, and moving in this region. This objective was predicated on the realization that the functional heterogeneity we observed between sites mandated that the inhabitants of this region combine activities and resources from different sites in their socioeconomic toolboxes—a phenomenon we have labeled in Chapter 12 as "distributed habitation." We were interested in determining where, why, when, how, and how often Roman peasants might have traveled. The majority of the sites excavated by the project yielded use or occupation levels dating to the late 1st c. BC through 1st c. AD. Therefore, the observations that follow are focused in particular upon this period. We return to the implications of this phenomenon in the concluding sections of the chapter. We found that mobility around this region can most effectively be understood as operating within a so-called meshwork of connectivity combining trans-regional movement that runs predominantly E-W with intra-regional movement that responds to the topography and hydrology of the region and, as a consequence, is predominantly oriented N-S. This meshwork should be envisaged as a combination of paths and decisions that are dialectically connected (Grey et al. 2015:197; cf. Ingold 2011; Gates-Foster 2012; Snead 2009; Given 2013).

Our second objective was to explore the implications of this movement for both the contours of everyday life in this locale and the construction of meaning and identity by the denizens of the region.

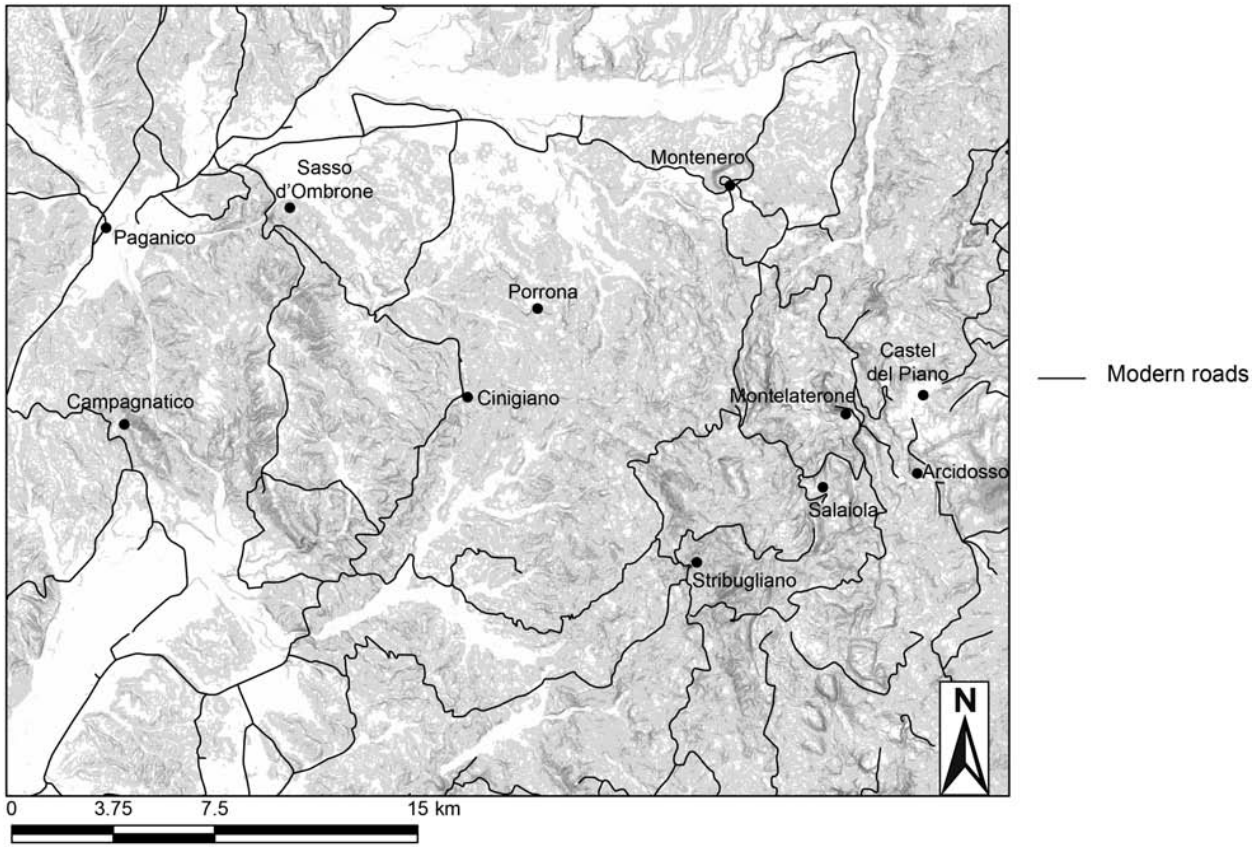


Fig. 17.1 Map of the modern commune, with roads and major population centers (ERZ).

While the project did not discover any clear evidence for activities or places that could be described as religious or ritual, nonetheless we would argue that the acts of movement explored in this chapter had closely analogous functions in this regard. In theoretical terms, our findings contribute to existing debates on mobility, landscapes, and locales in three ways. First, by explicitly acknowledging both the unavoidable influence of our own experience of this locale and the intimate knowledge of it possessed by its modern and ancient inhabitants, we hone scholarly approaches to familiarity as an analytical concept (cf. Close 2000; Gibson 2007; Given and Hadjianastasis 2010; Given 2013; Grey et al. 2015). Second, by recognizing regular, season-to-season variation in the height and flow of rivers, the denseness of vegetation, and the characteristics of the soil that underlay the routeways and paths trodden in this locale, we add further support to the proposition that seasonality underpinned and shaped the patterns of everyday life for Roman peasants (cf. McCarthy 2013; Shaw 2013; Halstead 2014). Finally, by espousing the model of distributed habitation and focusing upon the innumerable, short-distance, largely pragmatic trips undertaken by peasants as part of their routine economic practices, we emphasize the fundamental importance of quotidian movement for both the physical and the metaphysical dimensions of peasant lifeways in this locale and elsewhere.

17.1 Landscapes and Movement

Given's pithy observation about the intimate relationship between landscape and movement sits atop several decades' worth of scholarly discussion of mobility and sedentism, landscape and agency. We have already introduced the locale as a tool that allows us to occupy the productive analytical space between environmental determinism, on the one hand, and over-emphasis of human agency divorced from context, on the other. Likewise, we have noted

the utility for our project of Ingold's notion of the "taskscape," the array of human actions within a particular socially constructed space (Ch. 3). Here, we exploit consonances between these two analytical constructs and suggest that a locale should be understood as characterized by movement (cf. Ingold 1993:162). Movement occurs at different scales, on varying periodicities, and with a range of regularities from quotidian to occasional.

As discussed in Chapter 12, placing movement at the center of the experience of peasants necessitates moving beyond the convenient but analytically unhelpful dichotomy between sedentism and mobility, a dichotomy that has been exhaustively and convincingly deconstructed in the last quarter-century. Most particularly, the intuitive but simplistic distinction between mobile hunter-gatherers and sedentary agriculturalists has largely been rejected. In a seminal series of studies focused on hunter-gatherer societies, Binford (1980, 1982) shifted attention away from typologizing social groups according to their mobility, in favor of an approach that focused on identifying different forms of mobility. Those forms of mobility, which he labeled residential, logistical, tactical, and territorial, should not be taken as static, prescriptive categorizations of those societies (cf. Kelly 1992; Close 2000). Rather, they may be used as conceptual tools for understanding the organization of groups, their relationships with each other and with the resources and topography of the landscape in which they lived. Meanwhile, the assumption that sedentism is the inevitable and irreversible concomitant of a move from a hunter-gatherer, pastoral, or nomadic lifestyle to an agricultural one, has been jettisoned. Scholars now recognize the potential for variation between the sedentism and/or mobility of individuals within a given group, between groups or individuals that interact with each other regularly, and over time in the experience of any given individual—whether that variation be seasonal, inter-annual, or according to the life path of the individual (Kelly 1992; Close 2000:49–50; Horden and Purcell 2000:377–383; Grey 2004, 2011:46–49).

For archaeologists, this process of deconstruction is both necessary and challenging. The shift away from typologies and toward the analysis of the function of movement and mobility as practiced by a particular individual, group, community, or society encourages consideration of the ways in which movement across a landscape is implicated in the processes of identity formation and the construction of meaning: that is, it paves the way for phenomenological approaches to landscapes, such as have been developed by Ingold and Tilley and will be evoked in the concluding section of this chapter (Ingold 1993, 2011; Tilley 1994). Methodologically, it throws into high relief the difficulties that attend any attempt to analyze mobility archaeologically. Mobility tends to be inferred from proposed sources of building materials, such as stones, as well as ceramics and other diagnostic small finds. However, a posited connection between two sites in a landscape is by no means a straightforward indicator of a route, let alone a journey between the two. On the contrary, it is most likely that objects move in indirect and circuitous ways between their putative sources and their eventual findspots (cf. Kelly 1992; Close 2000; Grey et al. 2015; and Ch. 16). In the present context, the proposition can be aptly illustrated with reference to a fragment of millstone discovered during the excavation of the site of Pievina, and sourced to the Vulsini volcanic complex, some 60 aerial km away (see Ch. 4). It seems unlikely that this millstone took a single journey from its point of origin—perhaps Orvieto—to the posthole from which it was ultimately recovered. Evidence from within our locale also encourages caution about constructing neat point-to-point journeys. The likelihood is that building materials were recycled regularly in this locale, and we should likewise not expect that ceramics discovered at a particular site traveled there from their point of origin by the most direct route.

In Chapter 3, we described the physical characteristics of this landscape, its hydrological regime, and the topographical features that result in a series of discrete yet connected zones. Movement within and between those zones entails a constant series of evaluations about the relative costs and benefits of traversing slopes and of effecting crossings at the innumerable large and small waterways. We have argued elsewhere (Grey et al. 2015) that the "meshwork of connectivity" that is so intimately implicated in this multidimensional calculus may be characterized as a combination of corridors of movement, pathways that combine broad continuity over time with minor seasonal, inter-annual, or episodic variations; and "focal points," locations where barriers (particularly waterways) can be more easily crossed (cf. Bell and

Lock 2000; Gibson 2007; Llobera, Fábrega-Álvarez, and Parcero-Oubiña 2011). Here, we build on that argument and suggest that these pathways, and the act of movement along them, defined this landscape and transformed it into a locale.

17.2 Evidence for Mobility

In our analysis of mobility around this locale, we combined a range of materials and methodologies (see Ch. 2). During the excavation of each of our sites, the building stones found in all structures were identified, and the closest naturally occurring geological outcrop located. (Fig. 17.2) The relationships between the two presented proxies for different kinds of journeys undertaken for a variety of possible purposes around and across this landscape. Specifically, we generated and tested routes between the site of San Martino and an outcrop of travertine adjacent to the site of Poggio dell'Amore; between Pievina and the volcanic complex of Monte Amiata; and between several of our sites and the small hill of Montenero, which we deemed to be the source of the red conglomerate and crystalline sandstone building materials found in those sites (Figs. 17.3–17.6).

Botanical evidence also provided proxy data for movement by individuals. At the smallest scale, the presence of cereals and fodder crops, legumes, fruits, and other edibles in and around the dwellings of this region encourages us to consider the short distance journeys that characterized quotidian mobility. Much longer-distance movement is implied by the presence of charcoal from beech (*Fagus*), fir (*Abies*), and tamarisk (*Tamarix*) at the site of Marzuolo. We have already noted in Chapter 13 that, while there is evidence that *Fagus* grew at lower altitudes in Roman antiquity, nonetheless it is most likely that the macro- and microcharcoal remains recovered from Phase 2 of the Marzuolo excavations derived from the slopes of Monte Amiata. Cautiously, we may place this evidence together with the building stone discovered

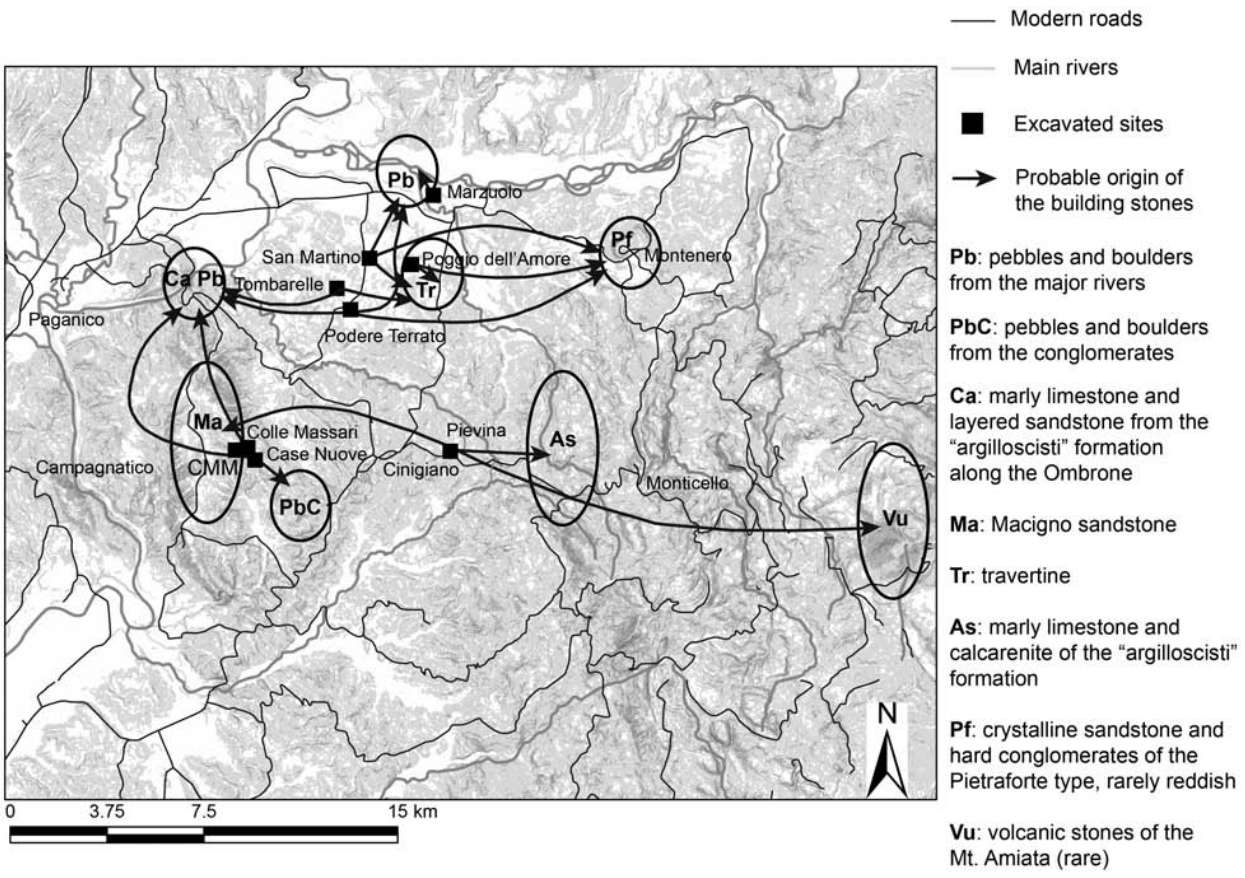


Fig. 17.2 Map of excavated sites with nearest outcrops of building stones (AA/ERZ).

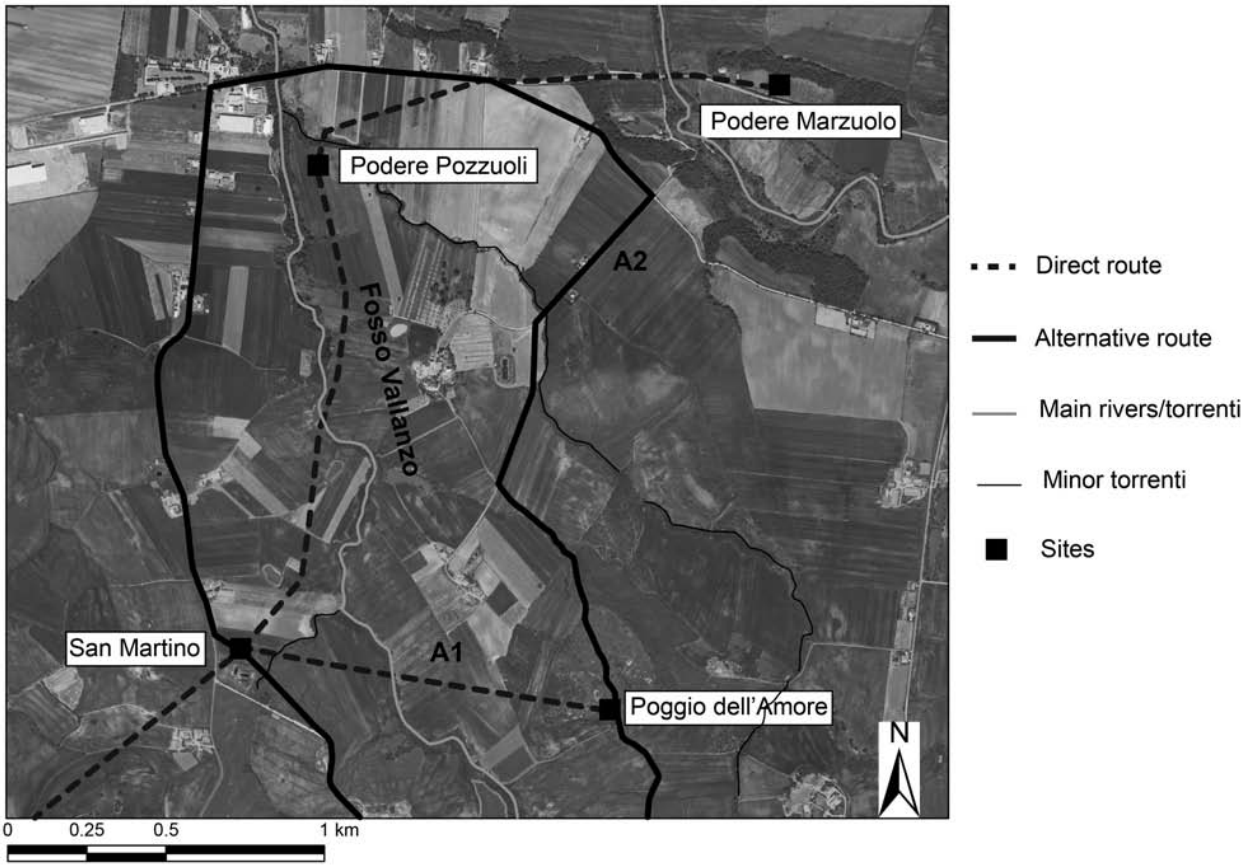


Fig. 17.3 San Martino-Poggio dell'Amore Route 1: A1 is a hypothetical direct route that takes the shortest possible path between the two locations. A2 is the N route that proceeds downslope from Poggio dell'Amore to the plain of the Orcia in the N, turns W to cross the Fosso Vallanzo and then south again, to ascend the slope to San Martino (AA/ERZ).

at Pievina and sourced to the same area and posit a relatively well-established and, perhaps, multidimensional relationship between this region and the volcanic complex.

Faunal evidence offers hints of mobility practices, especially the differential distribution of animal bones across the various sites of the project. We have hypothesized above that this differential distribution reflects strategies for arriving at a balance of consumption across the locale (see Ch. 13). At Marzuolo, we may also be witnessing the (seasonal?) culling of younger sheep and goats, perhaps connected to flock-management practices (see Ch. 14). Cautiously, we have inferred a preponderance of sheep over goats, on the grounds that sheep congregate together in flocks more effectively, and we will return to the implications of small-scale sheep herding in this locale for mobility practices and knowledge of the landscape below. The presence of deer bones at Tombarelle offers hints of hunting and may, perhaps, be connected to botanical evidence that suggests utilization of woodland resources and thus regular or episodic travel to and from wooded areas of the locale.

The ceramic evidence is especially illuminating for our analysis of movement within and beyond the bounds of this locale. Three kiln facilities were identified, at Pievina, Tombarelle (tentatively), and Marzuolo, while Ghisleni's survey identified a further seven. Sigillata sourced to Marzuolo was recovered from a number of surveyed and excavated sites across the locale, and this provided a basis for modeling connectivity at the episodic scale (Fig. 17.7). Equally, it is possible that coarse wares and tiles produced at Pievina and/or Tombarelle found their way onto other sites in the region—although this remains speculative. Imported wares, if in relatively small quantities, were recovered from the majority of sites excavated in the locale (see Table 15.6). For example, the Phase 1 levels of Marzuolo reveal the presence of amphorae largely drawn from the surrounding region. In Phase 2, these were supplemented by amphorae from the Aegean and Asia Minor, as well as a single Baetican fish sauce amphora. The presence at

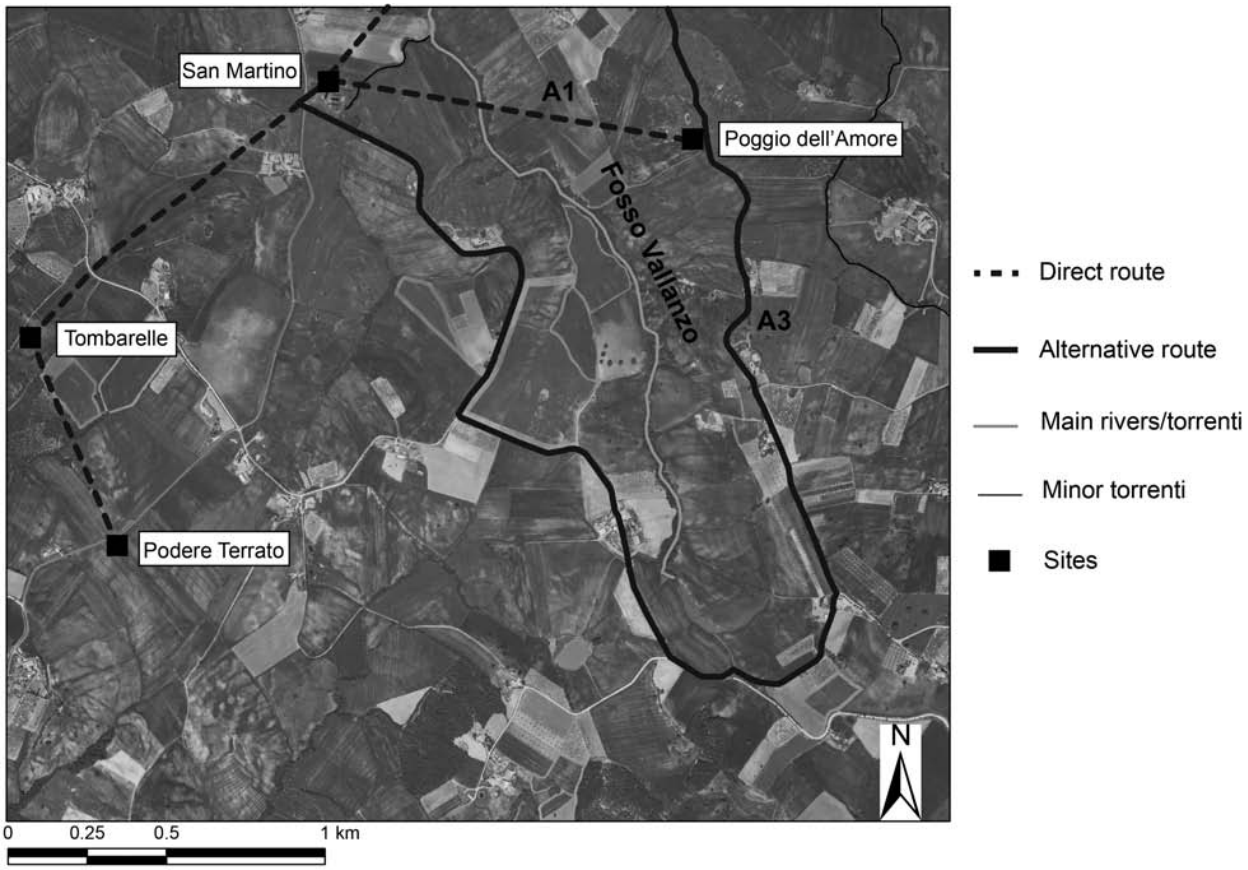


Fig. 17.4 San Martino-Poggio dell'Amore Route 2: A1 is the same hypothetical direct route as in Fig. 17.3. A3 is the southern route that heads upslope from Poggio dell'Amore, passes the headwaters of the Fosso Vallanzo and turns W then N, to descend the slope to San Martino (AA/ERZ).

the site of potters' stamps attributed to MANNEIUS and VMBRICIUS, names attested also at Torrita di Siena during the middle of the 1st c. AD, also hints at connectivity to the northeast. This connectivity is complemented by hypothesized links between ceramic assemblages recovered from the late antique levels at Pievina and contemporaneous assemblages at the Roman town of Roselle (Ch. 5).

In employing these various sources of data as proxies for mobility and in addition to the paths already noted above (see Figs. 17.3–17.6 and cf. Grey et al. 2015), we produced least-cost paths with varying weights and parameters that traversed the entire locale from east to west (between Monticello Amiata and Paganico) (Figs. 17.8–17.9) and an analysis of cost-distance of the whole *comune* from the site of Case Nuove (Color Fig. 17.10). These exercises employed aerial photographs, kriging and raster-based methodologies in various combinations, which we have outlined in more detail elsewhere (cf. Ch. 2 and Grey et al. 2015). We also consulted the Catasto Leopoldino, an early 19th c. cadastral map, and its surrounding area, for evidence of paths, routeways, and roads, as well as putative ferry and fording points across the waterways of the region. In the first instance, our objective was to trace the pre-modern meshwork of connectivity that existed in this locale. Further, we wished to extend our analysis of mobility beyond the bounds of the locale, to include the large Roman-era settlement of Roselle to the SW, as well as the Via Cassia to the N, which would lead, in turn, to Siena and Chiusi. We also gathered anecdotal information from the region's current inhabitants. In combination, this data provided us with suggestions and possibilities for mobility within, around, and across this locale. Those suggestions were then evaluated through extensive prospection by vehicle and on foot (Ch. 2).

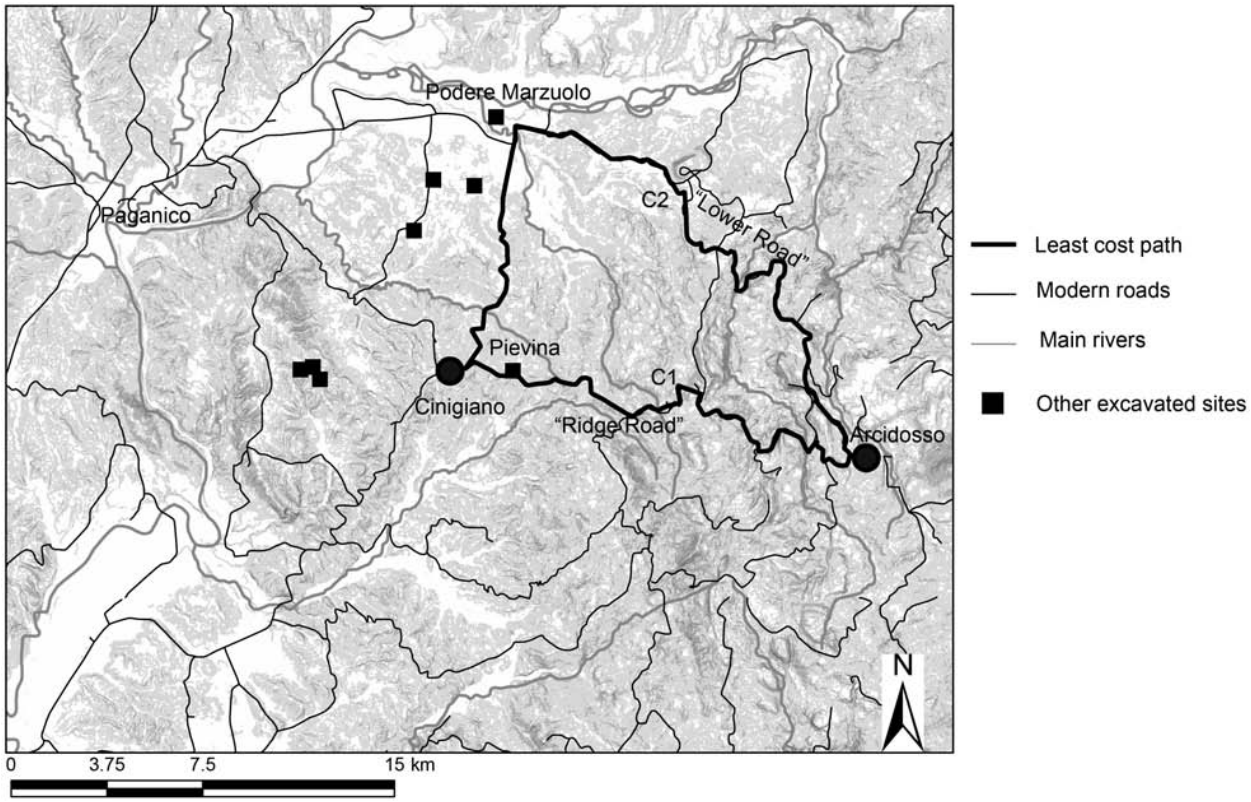


Fig. 17.5 Least cost path for Arcidosso-Cinigiano routes: C1 is the "ridge road," which follows the highland route between the two locations. C2 is the "lower/river terrace road," which descends the slopes to the northwest of Arcidosso toward the terrace of the Orcia River, heads west to the vicinity of Podere Marzuolo, then turns south to climb up the slope to Pievina (AA/ERZ).

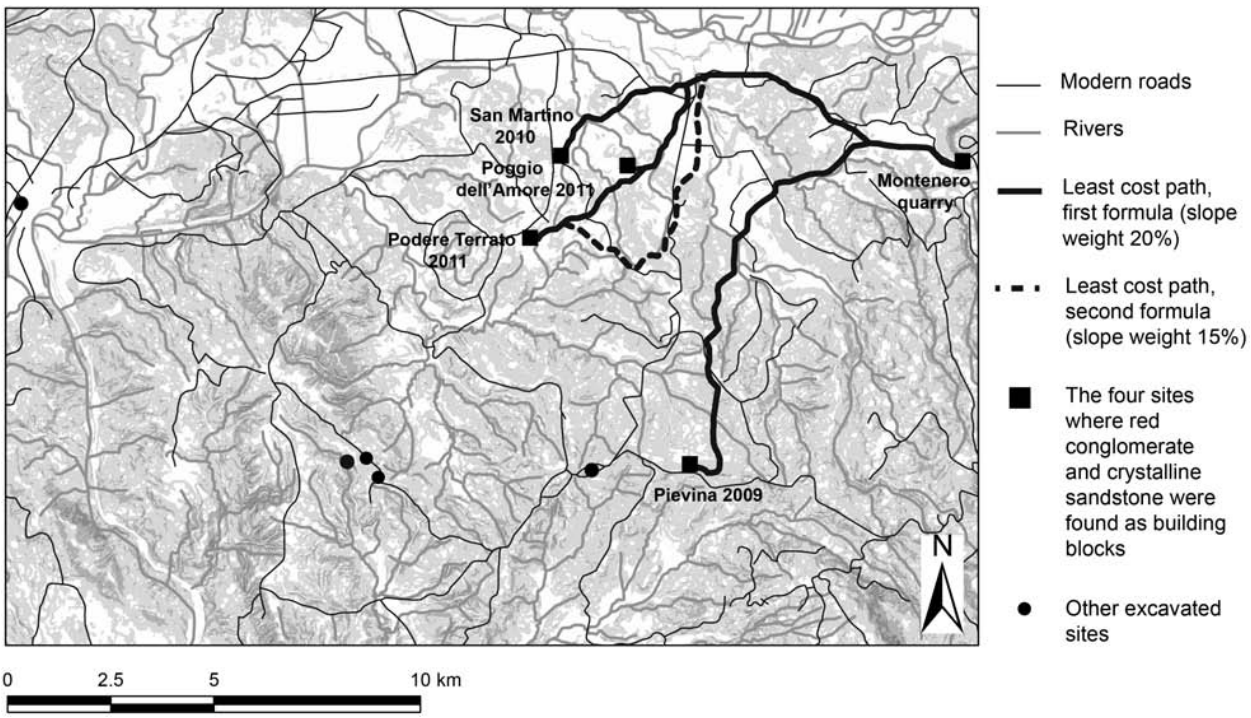


Fig. 17.6 Least cost path from the four sites where red conglomerate and crystalline sandstone were found as building blocks, to the quarry of Montenero; first formula, continuous line, with slope weight 20%; second formula, dashed lines, with slope weight 15%.

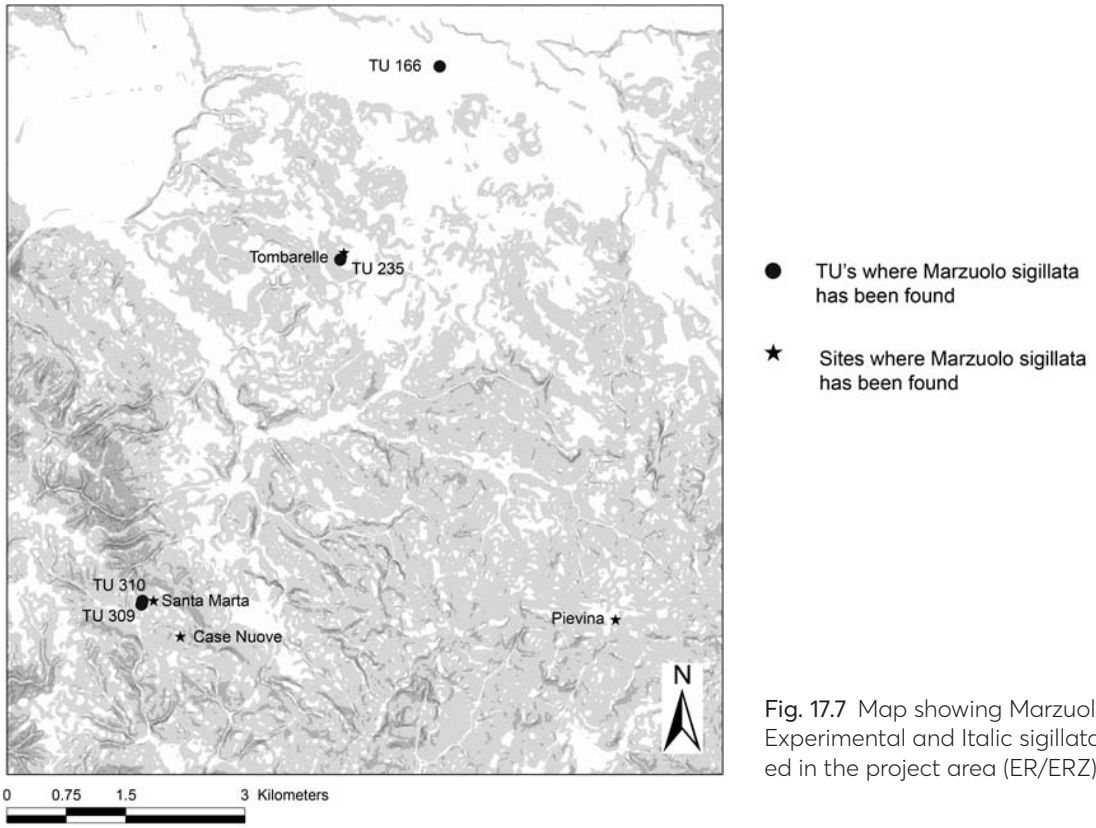


Fig. 17.7 Map showing Marzuolo wares (both Experimental and Italic sigillata) as distributed in the project area (ER/ERZ).

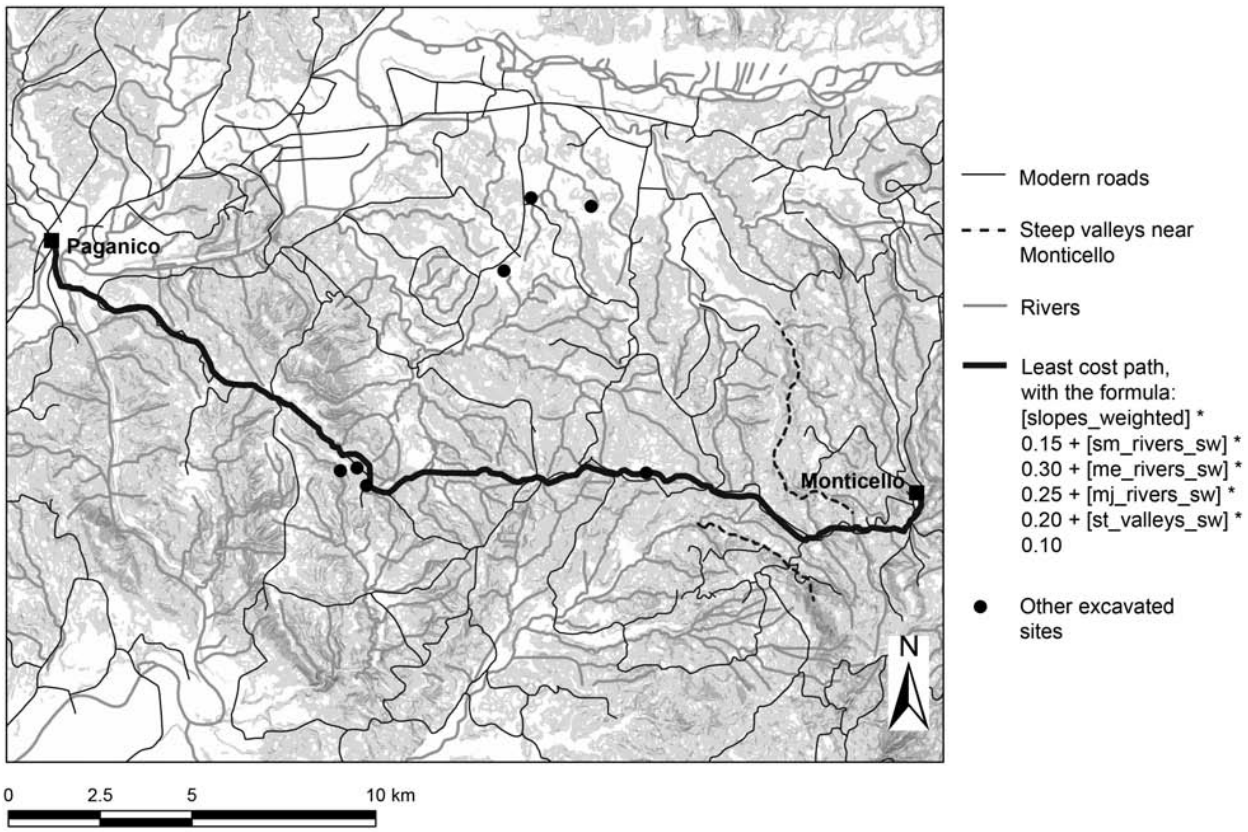


Fig. 17.8 Monticello to Paganico least cost path between Monticello and Paganico with the formula: [slopes_weighted] * 0.15 + [sm_rivers_sw] * 0.30 + [me_rivers_sw] * 0.25 + [mj_rivers_sw] * 0.20 + [st_valleys_sw] * 0.10; black dots are the sites, red lines the roads, blue lines the rivers, brown lines the steep valleys near Monticello (AA/ERZ).

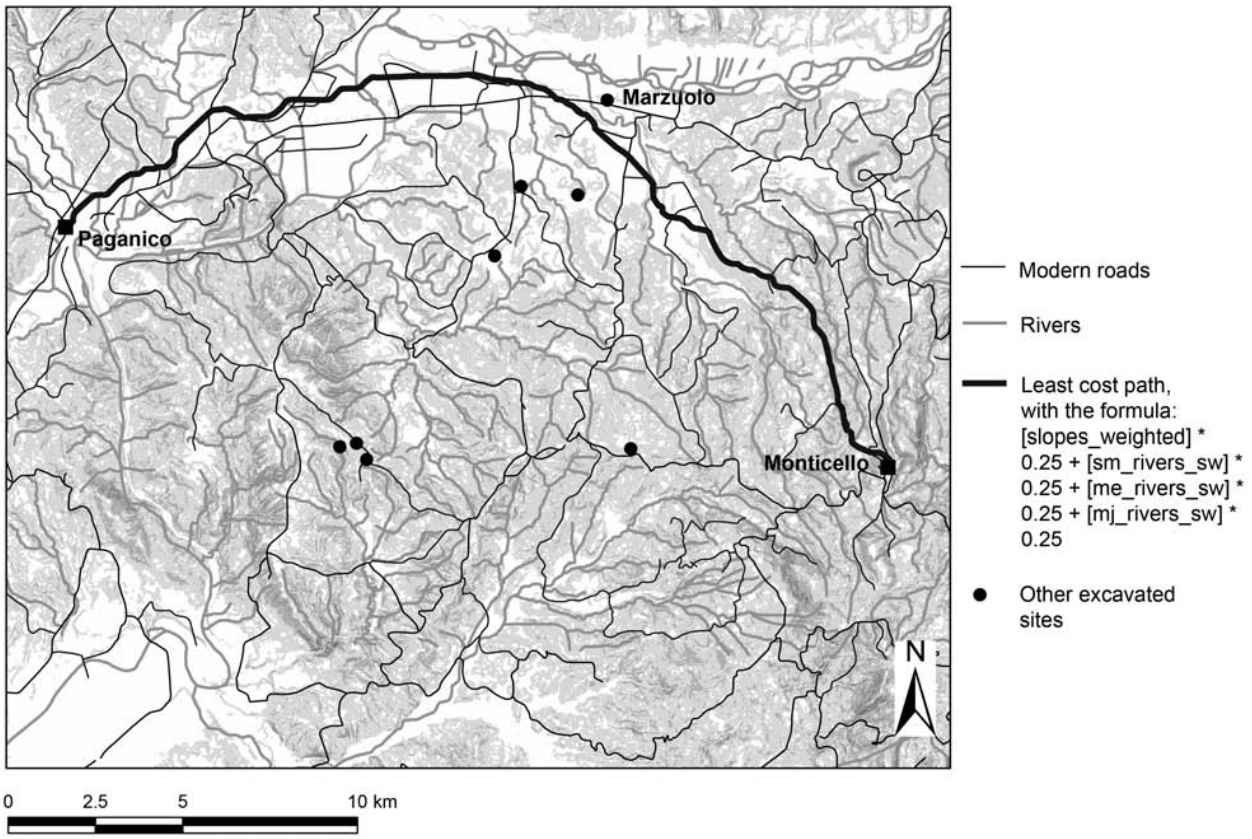


Fig. 17.9 Monticello and Paganico least cost path with the formula: [slopes_weighted] * 0.25 + [sm_rivers_sw] * 0.25 + [me_rivers_sw] * 0.25 + [mj_rivers_sw] * 0.25 ;black dots are the sites, red lines the roads, blue lines the rivers; yellow dot, the site of Marzuolo (AA/ERZ).

17.3 Landscapes, Ancient and Modern

In order to embrace the experience of moving across this landscape, we must countenance a constant interplay between the mental maps that individuals construct—whether based on physical artifacts such as the Catasto Leopoldino, GIS reconstructions, personal experience, anecdote, memory, or indeed any other comparable foundation—and the specific realities of the routes they take when they move (cf. Certeau 2002; Fitzjohn 2007; Forbes 2007; Gibson 2007; Given 2013). For our purposes, this intense (and intensely self-critical) focus upon the individual experience of landscapes has two significant consequences. First, it highlights the disjunction between the experiences of living in this locale on an ongoing basis and of episodically visiting it for purposes of fieldwork. The meshworks of pathways that we perceived during our fieldwork, and the decisions that we made about where and how to travel those pathways both engendered and resulted from our own changing understanding of and familiarity with the locale. But, while we derived meaning from this landscape and embedded memories within it from year to year, our experience was based on one month of intensive fieldwork, carried out over six successive summers. It could never replicate the experience of permanently dwelling in the locale and participating in its seasonal rhythm: planting, cultivating, and harvesting grains and pulses; maintaining flocks and herds of animals; constructing and maintaining work sheds, fences, and gates; traveling to visit friends and family, or to take on temporary, seasonal, or permanent employment; and so on (cf. Forbes 2007). To be sure, we attempted to mitigate this through campaigns of systematic driving and walking on the roads, and tracks of the region; through serendipitous exploration of chance-encountered routes and

pathways; and through extensive conversation with the current residents of the locale. Nonetheless, it is necessary to acknowledge explicitly the limitations that circumscribed those attempts (cf. Fitzjohn 2007:41–42; Forbes 2007:21–22; contra Tilley 1994).

Alongside these impediments to our familiarity with this locale, especially with regard to its annual seasonal cycle, our interaction with this landscape is conditioned by certain features that are decidedly modern—or, at least, post-ancient. Cinigiano, the current administrative center of the *comune* and, consequently, a hub with roads linking it to all of the other towns in the vicinity, betrays no evidence of having been settled in the Roman period. Similarly, the hamlets, villages, and towns that serve as focal points for the road system largely trace their history to the medieval period and, in the case of the *frazione* of Borgo Santa Rita for example, to agrarian reforms in the Maremma region beginning in 1951 (Mangiavacchi 2011). As a consequence, the bulk of the major roads in the region are either links between medieval settlements or the result of modern construction projects (see Fig. 3.2).

Such sites and the roads now linking them exercise a powerful influence upon modern-day access to and exit from the locale (see Fig. 17.1). On the westernmost edge of our region and to the S of the bisecting ridge, a long modern bridge serves as the link between Cinigiano and the town of Campagnatico (founded as a fiefdom of the Abbadia San Salvatore on Monte Amiata, which itself traditionally traces its origins to the 8th c. [Ascheri and Kurze 1989]). To the N, there exists a major bridge at Sasso d'Ombrone (formerly Sasso di Maremma and originally founded as a castle in the 13th c. [cf. Guerrini 1999]), a point that is attested on the Catasto Leopoldino as a ferry crossing and bears traces of previous bridges. East of this bridge is another, linking Paganico directly to Borgo Santa Rita across not only the Ombrone but also the rather deep and steep-sided Fosso Lanzo and Torrente Gretano, while further east still is yet another, spanning the entirety of the Orcia's floodplain on the way north to the Castello Banfi vineyard. Meanwhile, in the SW corner of the region at the *frazione* of Arcille (founded contemporaneously with Borgo Santa Rita [Mangiavacchi 2011]), living memory records a ferry while the modern elevated road traverses the so-called "Via dei Laghi" on its way to the vicinity of Roselle. These modern bridges threaten to distort our analysis of ancient movement in this landscape, for they constrain and channel our modern movement.

As already noted, no Roman road comparable to the Via Cassia, the Via Clodia, or the Via Aurelia ran through this region (Ch. 3; cf. Citter and Arnoldus-Huyzendveld 2011). The routes that we drove, walked along, and observed in this region provided no unambiguous evidence that they had been in use in the Roman period. Nonetheless, it seems reasonable to assume that the patterns of movement necessitated by the model of distributed habitation that we have observed were enacted repetitively, or at least episodically, in antiquity. Moreover, while we eschew a stance of environmental determinism, it is also true that the physical geography of the region renders some strategies and routes of movement more likely than others—a phenomenon which, we assume, was as true in antiquity as it is today.

17.4 Establishing Parameters for Movement

In physical and topographical terms, and as outlined in Chapter 3, this locale is divided into three broad sub-locales. As documented by Ghisleni's survey of the *comune*, the E and SW regions appear to have been relatively thinly populated in antiquity, whereas the central region (the focus of the project's excavations) boasted a much denser and more diverse collection of sites. In our geological and topographical survey, we posited that the river plain north of the Orcia and the site of Montenero and its immediate vicinity were naturally a part of this locale in antiquity—a proposition supported by the presence of Montenero-sourced building stones at most of the sites in this locale. Finally, the western sub-locale was the location of the region's only villa, Santa Marta, an installation that appears most naturally to be part of the villa system around Paganico, immediately across a bend in the Ombrone River to the northwest. By contrast, the S and SE parts of the *comune* beyond Monticello Amiata are largely excluded from the present study, on the grounds that prospection of the ridges and roads in this region strongly suggested that the riverine plain of the Melacce was not physically a part of this locale. Together with the

five movement zones we have hypothesized on the basis of topographical and hydrological features, this division into three connected yet discrete sub-locales has implications for our interpretation of movement within and across this locale.

Our campaigns of landscape prospection revealed that mobility around this landscape is characterized by the interaction between these physical elements and human decision making and pragmatism. The dynamics of this interaction are well illustrated by our experience of plotting and then ground-truthing routes between the sites of San Martino and Poggio dell'Amore as proxies for quotidian mobility within this locale and between Pievina and Monte Amiata as proxies for episodic mobility. We have explored these routes in more detail elsewhere (Grey et al. 2015). The first was suggested by the presence at San Martino of a travertine building stone sourced to an outcrop adjacent to the site of Poggio dell'Amore. The exercise employed GIS and aerial photographs of the region from the 1940s and 1950s to generate three alternatives (see Figs. 17.3–17.4). Ground-truthing by car determined that the first of these (A1), a direct point-to-point connection, was highly unlikely due to the steep sides of the Fosso Vallanzo, the most significant waterway that separated the two sites. Meanwhile, the alternative routes A2 and A3 navigated the barrier presented by water in two complementary ways. Route A2, the northern, lowland route, descended along spurs running N-S to the river terrace of the Orcia and then proceeded along that river terrace, thereby avoiding the need to cross the majority of the small tributaries of the Vallanzo. This route crossed the Vallanzo itself at a point characterized by relatively shallow slopes on both sides and traversed from at least the time of the Catasto Leopoldino by a bridge. Meanwhile, route A3, the upland route, crossed the bulk of those streams and rivers in its path at or very close to their headwaters, where they were relatively easily traversable, while avoiding the challenge presented by the Fosso Vallanzo altogether.

Detailed prospection of the rivers that border this region—namely, the Ombrone to the W and NW, the Orcia to the N, the Melacce to the S, and the Zancona in the NE—as well as the major tributaries within the region, including the Ribusieri and Trisolla, further emphasized the fundamental influence of waterways in shaping the direction, timing, and means of walking in and around this locale. (Fig. 17.11; see also Figs. 3.9 and 3.17). In each case the various combinations of river course and/or incised valley, slope of the approaching banks, and topography produced only a limited number of viable crossing-points. This interpretation is supported also by the evidence of the Catasto Leopoldino, which records a rather small number of irregularly distributed fords and ferry points. Broadly speaking, we may envisage around six points of ingress/egress to the locale, although these points may have varied or changed their location in small ways from year to year or season to season, as the rivers in question moved across their beds and floodplains or varied in the rate of flow and volume of the waterway.

Connectivity to the W and N, exemplified by routes in the direction of Paganico, Siena, and Roselle seems possible from a number of different points. But connectivity between the micro-regions that utilized each of those points appears to have been transacted only with some difficulty. The challenges to movement in this part of our locale presented by the Ribusieri have already been alluded to in Chapter 4 above, so here we concentrate on the impediment presented by the steeply incised valley of the Zancona, a tributary of the Ente which runs S/N into the Orcia to the west of Arcidosso. Crossing this river is a crucial part of any route between the Monte Amiata volcanic complex and the site of Pievina some 12 km distant as the crow flies. This second exercise in route-plotting and ground-truthing was prompted by the presence of a building stone at Pievina that was sourced to Monte Amiata. Initial phases of least cost path modeling using a raster GIS program yielded two complementary routes between the towns of Arcidosso and Cinigiano. Arcidosso provides a convenient proxy for Monte Amiata while Cinigino approximates the site of Pievina located a short distance to the NE. The first was a route that travels along the ridge bisecting the region (dubbed the "ridge road"), which results in a journey of about 20 km along modern roads; the second, a route that descends one of the spurs to the N of that ridge as far as the river terrace, runs along the terrace past Marzuolo and then ascends another spur to meet Cinigiano (dubbed the "river terrace road"), for a distance of about 28 km along modern roads (see Fig. 17.5).

Both of the proposed routes necessitated crossing the Zancona. The Catasto Leopoldino preserves evidence for three ferry/fording points of this river

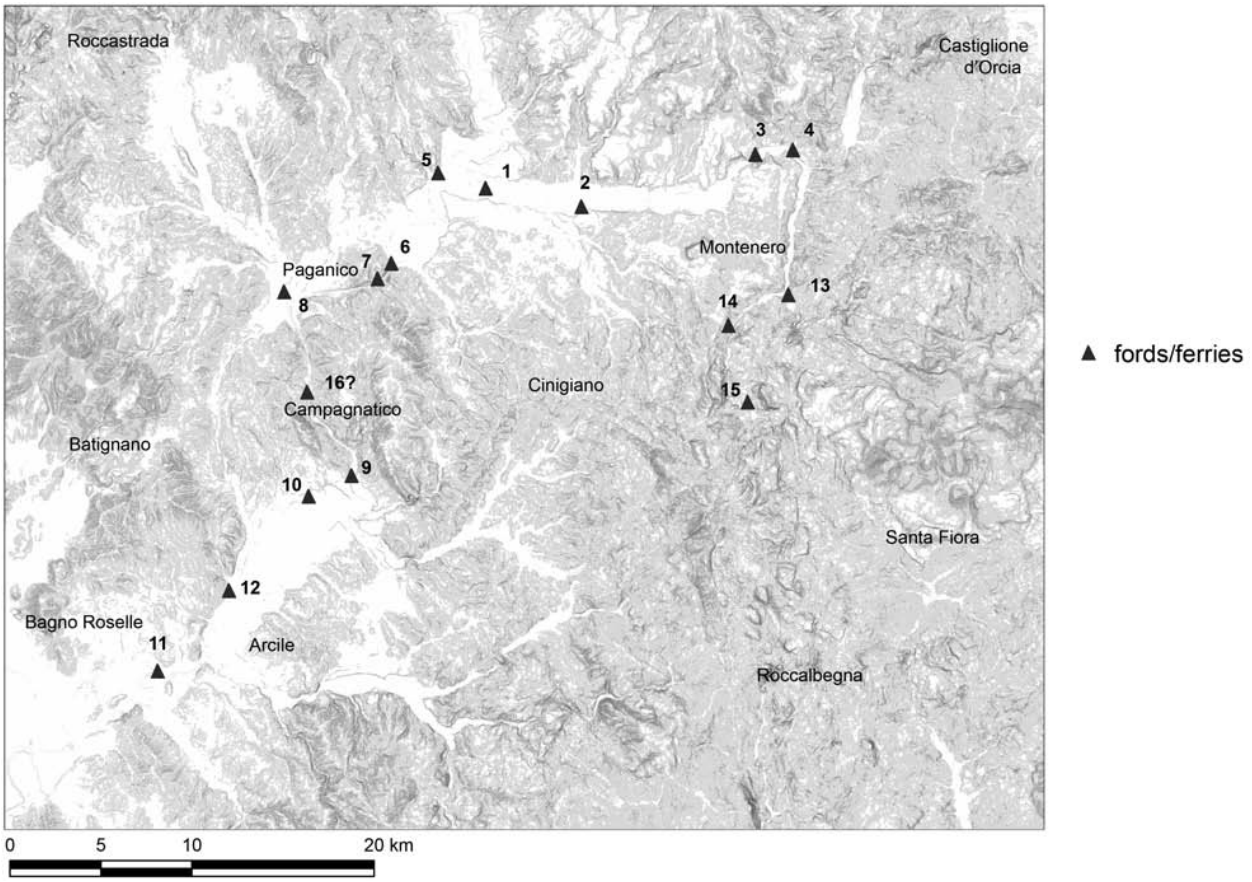


Fig. 17.11 Overview of the ford and ferry points over the Orcia, Ombrone, and Zancona/Ente in the region as identified on the Catasto Leopoldino (AA/ERZ).

(Fig. 17.12). The northernmost crossing point (13 on the map) would form a part of the notional "river terrace road," and currently serves as a link between the medieval/modern towns of Montegiove and Montenero. It is still accessible, involving an altitude drop of 80 m from the modern road onto a flat terrace bisected by the river, which at this point is shallow and gently flowing, at least during the summer months. The middle point (14 on the map) is part of an intermediate route that, in post-ancient times at least, functions as another connection between Montegiove and Montenero (Fig. 17.13). This fording point has been largely superseded by a modern bridge, which itself is a replacement for an earlier bridge that still exists, but in a state of disrepair. Local informants from the Podere Bandinaccia reported crossings of the ford by foot and with donkeys, although they also noted easier crossing points downstream, to the N. The southernmost point (15 on the map) facilitates the "ridge road." On the Catasto Leopoldino, it serves as a connection between the medieval/modern towns of Montelaterone and Monticello Amiata. The ford itself is not currently easily accessible, and positing relationships between it and the modern road system is hampered by gaps in this section of the Catasto (Fig. 17.14). A bridge visible in the aerial photographs from 1954 and located around 50 m downstream from the ford has since collapsed, although the modern bridge bears traces of an access road (now blocked) heading in its direction (Fig. 17.16). None of these crossings is completely straightforward, each involving either a tricky descent or a detour out of what might be deemed a more direct route. Alongside our experience with traversing or avoiding the Fosso Vallanzo outlined above, this offers eloquent illustration of our proposition that waterways function as "focal points" in this region, tethering the meshwork to certain points and necessitating, in metaphorical terms

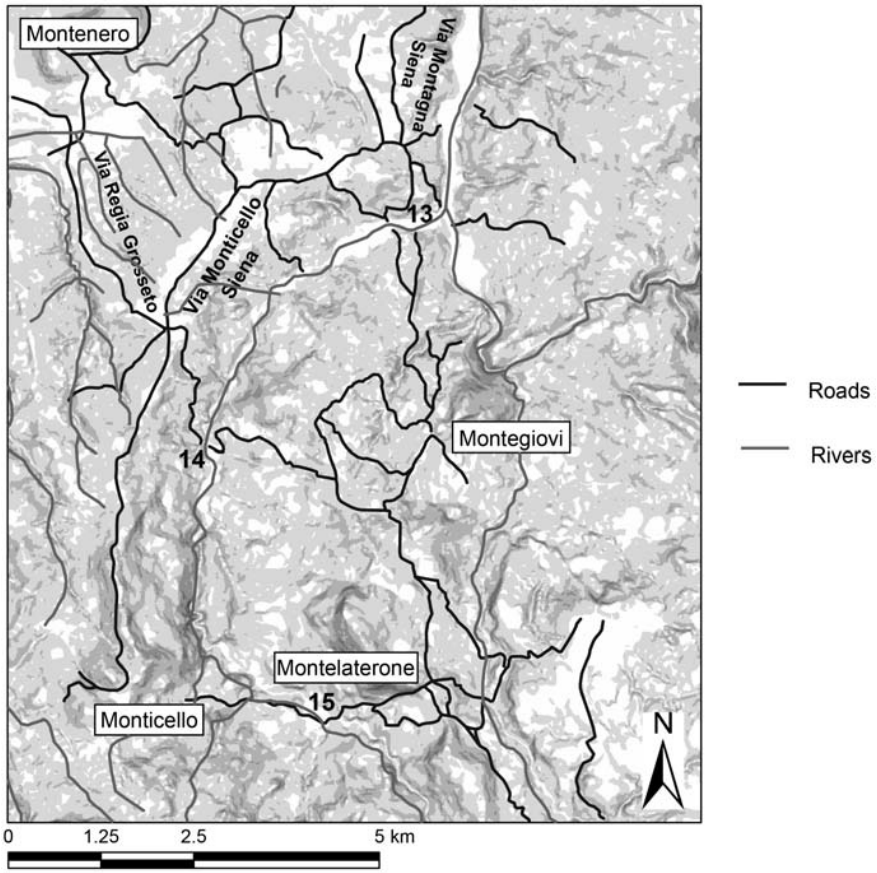


Fig. 17.12 Detail of Fig. 17.11, showing possible crossing points of the Zancona valley, as identified on the Catasto Leopoldino (AA/ERZ).

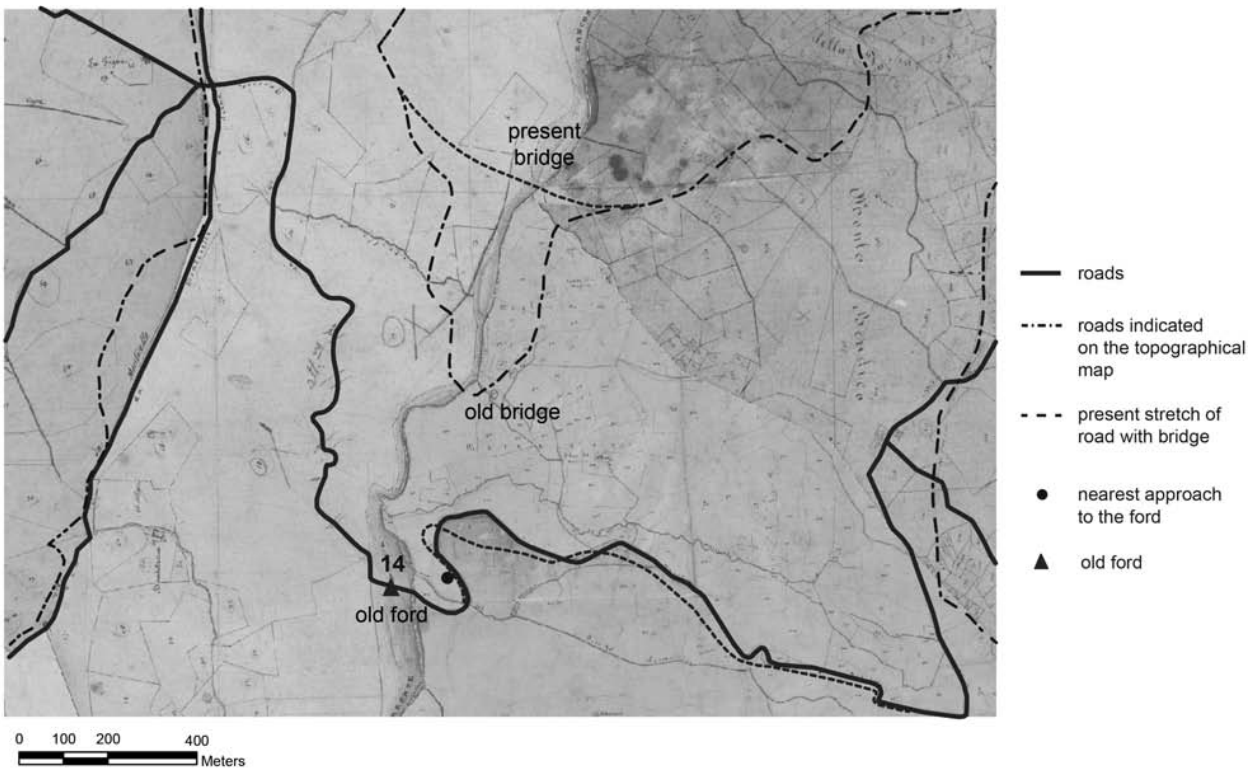


Fig. 17.13 Detail of Fig. 17.11, central crossing point (number 14 from Fig. 17.11) of the Zancona valley identified on the Catasto Leopoldino. Roads are those marked on the Catasto. The black dot indicates the nearest approach made to the ford during ground-truthing (AA/ERZ).

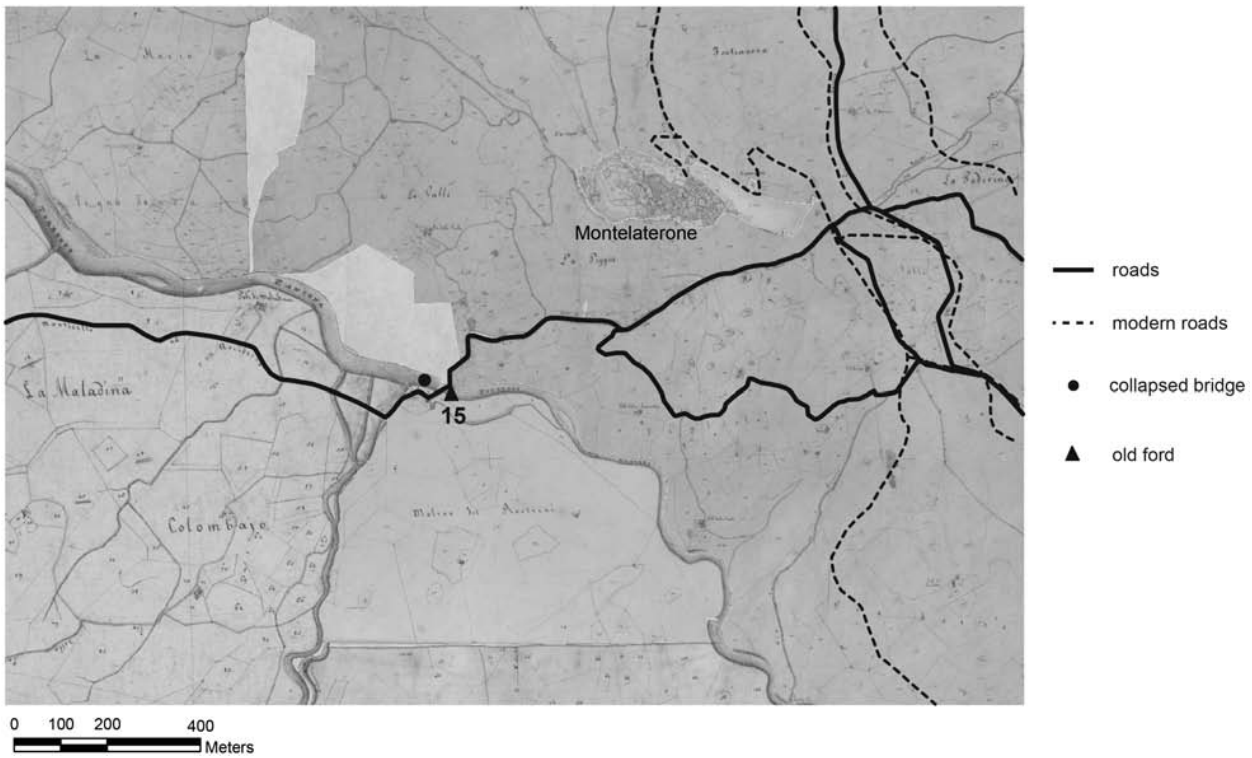


Fig. 17.14 Detail of Fig. 17. 11, southernmost crossing point (number 15 from Fig. 17.11) of the Zancona valley according to the Catasto Leopoldino. Roads are those marked on the Catasto. Black dot is indicated the collapsed bridge found during ground-truthing (AA/ERZ).

Fig. 17.15 Photo, Torrente Zancona area, at modern bridge over the river, intersection with an old road leading to a crossing-point higher up the river valley (CG).

Fig. 17.16 Fording point at Podere de Noce, near Paganico, according to the Catasto Leopoldino. Roads are those marked on the Catasto (AA/ERZ).

at least, a certain bending and/or stretching of that meshwork to accommodate them.

The experience of establishing crossing-points of the Zancona also highlighted the crucial role played by human decision making in movement around this locale. There are two aspects to this. First is the unavoidable, pragmatic fact that, if one is to move between our region and Monte Amiata—movement that we may surmise on the basis of both the presence at Pievina of volcanic building material and the presence at Marzuolo of trees that most likely grew on the slopes of that mountain—then the Zancona needs to be crossed, regardless of the effort cost involved. In sum, finding a way across the Zancona seems an essential component of connectivity across this region, so much so that the effort required to effect and maintain such crossings is expended on the basis of a pragmatic calculus of necessity (cf. Fitzjohn 2007:39–40; Forbes 2007:178–184, 389–390). This pragmatic aspect to mobility entails the kinds of routes that one is prepared or constrained to choose. Given evidence for the movement of building stones, wood, and ceramics across this locale, we determined that routes would need to be passable by individuals on foot together with laden pack animals—rather than carts, which are unsuited to the topography and geology of the region and rare even into the middle of the 20th c. (Ch. 2; Grey et al. 2015). This has implications for the gradients of the slopes in question and the amount of time that we imagine these journeys to take, for ethnographic evidence suggests that donkeys and mules, especially when bearing burdens on their backs, descend slopes much more slowly than humans (Forbes 2007:186).

Alongside the unavoidable, pragmatic dimensions of route selection in this locale, the second issue illuminated by the exercise in plotting routes between Pievina and Monte Amiata (see Fig. 17.5) concerns the amount of time individuals are prepared to spend traveling. Based purely on the rather arbitrary parameters of the GIS program, both routes seemed equally plausible. Further, the results of extensive experimentation in ArcGIS, inputting different values for the weighting of slopes and rivers

as barriers in this landscape, yielded only marginally different versions of the "ridge" and "river terrace" routes, while very slight adjustments to those parameters produced a "flip" from one to the other. We, therefore, inferred that, in terms of pure effort cost as measured computationally, there was little to separate the two. Following prospection by car, both routes were walked in their entirety, entailing a four-hour walk for the upland route and slightly under six hours for the lowland route, at a speed of ca. 5 km/hour.

Ethnographic evidence suggests that the maximum distance a human and a laden donkey can travel in a day is around 25–30 km, suggesting that both these routes fall within the bounds of plausibility. By this measure, the upland, N route would seem to have been relatively easily traversed in a day, and conceivable as a return journey. The S route was also achievable as a one-way day trip but somewhat less likely as a return—although if the objective were to bring wood for fuel to the kilns at Marzuolo, it would have been shortened by around two hours. But here we encounter the subjectivity of decision making, because ethnographic evidence also suggests that the distances that farmers are willing to walk in a day is wildly subjective and notoriously difficult to substantiate (Close 2000:72; Forbes 2007:178–189; Gibson 2007:77).

In combination, exploration of the walks between San Martino and Poggio dell'Amore, on the one hand, and Monte Amiata and Pievina, on the other, provides useful parameters within which to address this issue. The two trips can be distinguished from one another on the basis of both their distance and the regularity with which they were undertaken. As we will discuss further below, these two elements are intimately intertwined. We should certainly not imagine that a walk of 25 km would be a regular part of a farmer's daily work rhythm (cf. Grey et al. 2015:197). By contrast, a walk of 5 km is more imaginable. Close's (2000:72) ethnographic account of hunter-gatherer populations suggests that trips of around 5 km are considered entirely unremarkable, although any longer may induce some grumbling. Given (2013:77), meanwhile, posits 5–7 km as a rule of thumb for the distance farmers are prepared to walk to their fields and then return. This is based, in part, upon Given, Knapp, and Coleman's (2003:316) account of agricultural practices on Cyprus, where one farmer is reported to have traveled some 7 km to his furthest-away field during the 1950s, a journey that we may imagine to have taken around 80–90 minutes of walking each way.

These examples of pragmatism, subjectivity, and decision making are powerful reminders that we should not concentrate solely upon the exigencies of the landscape, and the unavoidable influence it has on human mobility. We must, in addition, imagine a range of human interventions and actions that might render crossing points in a landscape more feasible or permanent. These include clearing and maintenance of brush, scrub, or foliage; laying of stones or perhaps tree trunks to effect or bolster a particular crossing point (such as was reported by a local informant in the vicinity of Podere de Noce, a crossing point of the Ombrone in the northwestern corner of the locale); and even the construction of tools to aid crossing, such as the stilts preserved in archaeological museums of peasant life in the region. These stilts were made from branches and could be easily carried or attached to a bag or pack. They offer ethnographic evidence for relatively regular traversal of waterways, perhaps even as part of a daily or weekly round of mobility—evidence that, in a modern context, was echoed by our discovery of tractor tire marks traversing the Melacce during our prospection of the southeastern corner of the region.

17.5 Scales of Movement

Kelly's charge to identify the various different forms that mobility took prompts consideration of movement at different scales and on varying periodicities. For analytical purposes, we envisage three forms of movement occurring in, around, and through this locale:

1. Occasional trips from the locale to destinations beyond its natural boundaries, likely to be a less regular journey that may have involved trade and exchange. These trips would encompass travel as far as the nearby Roman town of Roselle, some 40 km to the SW. Both the aforementioned "ridge" and "river terrace" roads that traverse the region extend as far as Paganico, thence onwards to Roselle, to the W, and Siena, to the N. Meanwhile, the ceramic

production site at Marzuolo encourages consideration of connectivity to the N, especially the Via Cassia and, thence, both the ceramic production site of Torrita di Siena and the Roman town of Siena.

2. Medium-distance movement within the locale, completable in a day, and likely also to have been part of the regular or periodic work-life of the locale's inhabitants or undertaken in order to obtain specific resources such as building materials or millstones, but perhaps involving remaining at the destination for a period of days or even weeks in order to fulfil particular tasks like sowing or harvesting of fields. This may be exemplified by the "ridge" and "terrace" routes that connected Pievina and the volcanic complex of Monte Amiata.

3. Quotidian, short-distance movement as part of one's daily life. This may be exemplified by the journey between the sites of San Martino and Poggio dell'Amore, separated by around 1 km as the crow flies and linked through the presence at San Martino of a distinctive travertine block sourced to an outcrop adjacent to Poggio dell'Amore. Within the context of the distributed habitation model, we also modeled different routes and connections between Montenero and the sites containing building materials and millstones sourced to its surrounding area.

This tripartite division of mobility is undertaken here principally for purposes of organization, for it is our fundamental contention that mobility in and around this locale can best be interpreted as a collection of short-distance trips, undertaken sequentially. This is not to say that peasants did not stray beyond a constrained "home territory," for their practices of living in this locale necessarily involved movement at a variety of scales and was animated by a pragmatic calculus of necessity. That said and as shown by our discussion of market activity in Chapter 15, exchanges of goods tend to be local exchanges, transacted by individuals who are known to each other. Consequently, the long-distance movement of goods is most likely to have been achieved by means of a series of interconnected shorter-distance trips. In this regard, then, we are cautious about placing too great a weight upon movement of goods as the sole proxy for mobility of peasants.

17.5.1 Occasional Mobility

Typically, a starting point for any regional or microregional study is to determine the extent to which the region is integrated into larger-scale socioeconomic and political networks. We have already noted that the apparent marginality of this locale was one of the elements that made it especially attractive as a case study. Nonetheless, we, began our study of mobility in this landscape by seeking to establish the connectivity between this locale and contemporaneous Roman sites and regions in the vicinity. Three characteristics, in particular, of this locale encourage consideration of movement at this scale. The first is the location of the agro-processing site of Case Nuove on the ridge road that runs the entirety of the locale, together with the close relationship that we posit on the basis of the landscape between the villa of Santa Marta and the villas around Paganico. Second is the location and apparent economic connectivity beyond our region of the ceramic processing site of Marzuolo, especially in its second phase of production (ca. 50–70 AD). Third, the close connections between the ceramic assemblage in the 5th c. layers of Pievina and ceramics found in Roselle. In what follows, we use these initial observations to build an impressionistic account of the connectivity that this region enjoyed with its surrounds. Here, as has been acknowledged elsewhere in this volume, it will become apparent that our initial hypotheses about the marginality of this locale were erroneous.

The collection of villas around the modern town of Paganico has received some limited archaeological attention (Barbieri 2005a), while the villa of Santa Marta is currently the subject of an ongoing excavation by a team from the University of Siena (Ghisleni 2010; Campana 2012–2014). What seems clear from the material culture evidence is that Santa Marta enjoyed some degree of connectivity to the villas around Paganico. Traces of a route running from Case Nuove northwest down the ridge to the Ombrone may be found on the Catasto Leopoldino, and local informants provided memories of fording sites and temporary bridges across the Ombrone at or near Podere de Noce, where the ridge meets the river (see

Fig. 17.16). This route was prospected on foot, beginning with a crossing of the Ombrone from Paganico and followed by a long, gentle ascent up the ridge in the direction of the medieval/modern town of Poggi del Sasso, for a distance of around 9 km. From Poggi del Sasso, the route passed by Case Nuove, located around 2 km away, before first descending to a shallow valley, then ascending another spur via the modern Strada Provinciale Voltina, which ultimately made its way up the ridge to Cinigiano and, from there, Pievina. The distance from Case Nuove to Cinigiano was approximately 5–8 km. While we determined that this valley presented some small degree of impediment to movement between the sub-locales of Case Nuove/Santa Marta (on the one hand) and Pievina (on the other), nonetheless we deemed the route relatively passable—especially given our conviction that, above all, a pragmatic, needs-based calculus informed travel in and around this region.

It seems unlikely that inhabitants of the micro-region comprising Marzuolo, Tombarelle, and the collection of associated smaller sites would have first traveled to Santa Marta to make their way to Paganico. Consequently, we hypothesized a second route or collection of routes between our locale and Paganico. The hydrological and topographical characteristics of the N part of the locale present two broad possibilities. We may imagine a route that runs W along the river terrace of the Orcia, crosses the Ribusieri, the Vallanzo, and the Trisolla, then meets the ridge road from Santa Marta/Case Nuove to traverse the Ombrone at Podere de Noce in the NW corner of the locale. This route was prospected on foot and by car as far west as Sasso d'Ombrone. Further west we encountered private property protected by a fence, although the Catasto Leopoldino preserves a route that runs along the S bank of the Ombrone, and we encountered the westernmost end of that route during prospection of the ridge route from Paganico to Case Nuove. While the Trisolla River, in particular, was found to be almost completely desiccated and easily crossed in the summer months (see Fig. 3.13), the Fosso Vallanzo was characterized by uneven, often steeply sloping banks on one or both sides, and would have required some kind of established and maintained fording spot to render it passable.

More likely, we may imagine a route from Marzuolo and Tombarelle that crossed the Orcia River much further E, then ran along its northern side before detouring around a steep hilly region to meet a historical road that connected Siena to the N and Paganico to the SW (Fig. 17.17). Manipulation of the values entered into a GIS application generated a series of least cost paths that resembled such a route, and the Catasto Leopoldino attests a number of potential fording points to the W of Marzuolo. Field testing of these routes suggested that, from Tombarelle, a crossing at the Trisolla/Infernaccio was once again likely. But such a route might have entailed an unnecessary detour from Marzuolo. The fording point just to the E and N of Marzuolo, attested on the Catasto Leopoldino and marked with a "2" on Figure 17.11 (cf. also Fig. 17.17) is one possibility for crossing the Orcia, while our GIS-generated map offered another possibility to the west. The "fit" between computer-generated routes, historical source, and personal observation here is imperfect and incomplete. Nonetheless, it seems reasonable to assume that fording the Orcia in the vicinity of Marzuolo was possible in antiquity as in the early modern period. Field testing on foot of the roughly 12 km route between Marzuolo and Paganico indicated that, once on the northern banks of the Orcia, the Torrente Gretano and Fosso Lanzo were likely to present the most significant challenges, although, again, we suspect that a pragmatic calculus existed to the effect that these crossings were an essential component of connectivity in this region. At any rate, we interpret the coexistence of these various routes as adding further support to our impression of this locale as a collection of micro-regions.

From Paganico, a relatively straightforward route exists to the urban agglomeration of Roselle, located some 20 km to the west as the crow flies. This route likely follows quite closely the contours of the modern road (see Fig. 17.1). However, from sites in the central and southern parts of the locale, we considered it unlikely that individuals would detour several hours N to exit the region at Paganico. At the same time, we deemed the fording point located at Arcille, in the SW corner of the *comune* and attested by local collective memory, unfeasible because of the large number of waterways that dotted the so-called "Via dei Laghi" just to the W, each one of which would have required a separate crossing point. The ferry point at Istia, first attested in 1572, boasting a bridge by 1872 and now, in the wake of the 1966 flood, replaced by yet another bridge, was rejected for the same reason. Consequently, we turned

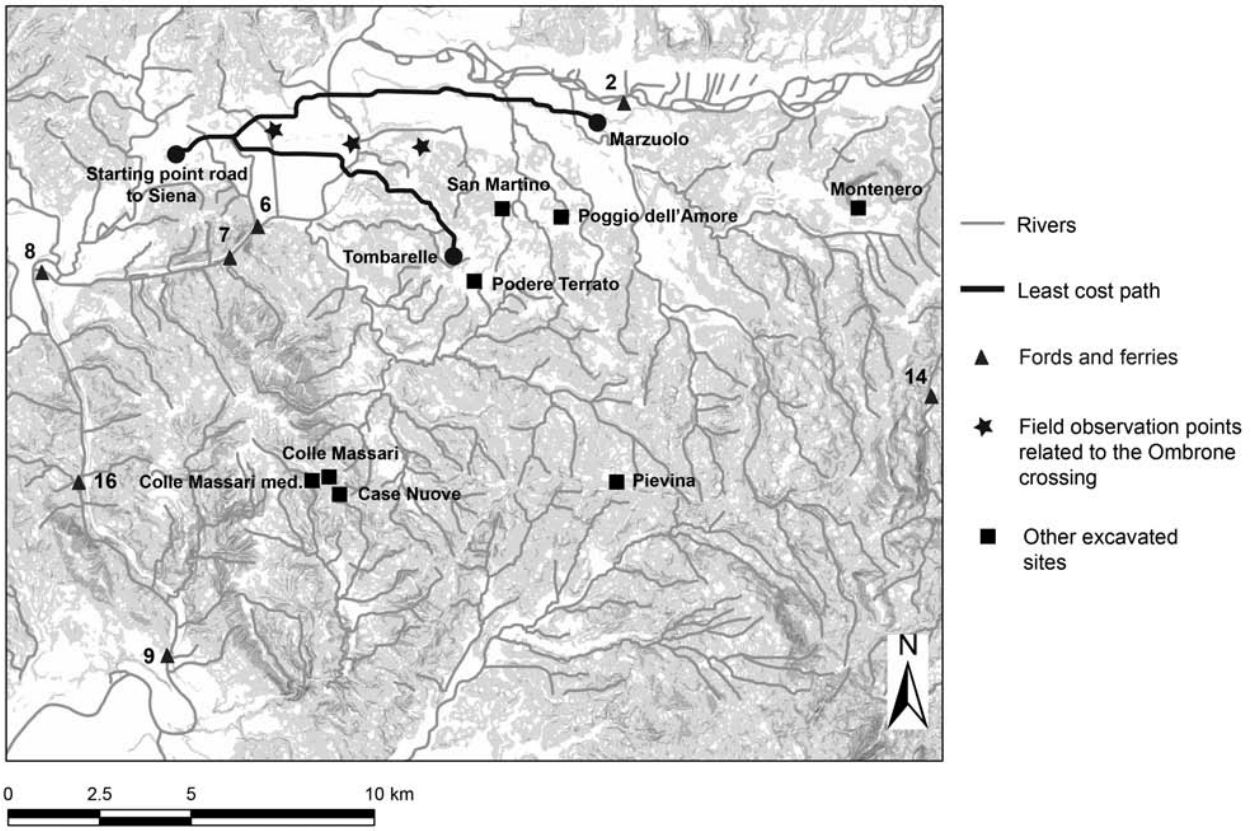


Fig. 17.17 Least cost path from Tombarelle and Marzuolo to the beginning of the road to Siena. Formula for cost raster: [slope) * 0.50 + [small_rivers] * 0.10 + [medium_rivers] * 0.15 + [large_rivers] * 0.25 (AA/ERZ).

to the Catasto Leopoldino and identified possible crossing or fording points which traversed the Ombrone in this part of the locale (cf. nos. 9, 10, 12, on Fig. 17.11). Next, we identified and then field checked a path which moved E and N from Roselle, following the hills in the direction of the Ombrone before encountering the river at one of the previously identified fording points (Color Fig. 17.18; cf. no. 12 on Fig. 17.11), a distance of around 9 km. The path includes one small river crossing, marked "e" on Color Fig. 17.18, but otherwise was characterized by gradual elevation changes between 170 m above sea level (asl) at its westernmost end and 200 m asl in its middle stretches, before descending to cross the Ombrone. While we lack a means to tie this path explicitly to the Roman period, its preservation on the Catasto Leopoldino suggests that it was a long-established route, and, given the characteristics of the river and the topography of the region, we deem it a likely approximation of connectivity between these parts of our locale and Roselle.

Connectivity to the N was also evaluated. This was suggested by the location of the ceramics production site of Marzuolo in a location close to several easy crossing points of the Orcia, the likelihood that there are some direct or indirect connections between potters' stamps found there and attested at Torrita di Siena, and an expectation that the Via Cassia would function as the most likely conduit from this locale to Chiusi to the E and Siena to the N. Possible crossing points to the west of Marzuolo have already been sketched above. To the E, local residents provided anecdotal evidence for carts crossing the Orcia in summer months in the vicinity of the Banfi vineyard, and the Catasto Leopoldino preserves evidence of ferry crossings further to the E still (cf. nos. 2, 3, 4 on Fig. 17.11). These crossing points link to a routeway, attested with minor variations on the Catasto Leopoldino. This routeway, which was driven in its entirety as far as Torrenieri, runs eastwards alongside the modern railroad, crosses a series of gentle valleys and then heads northwards from La

Sesta until it encounters the Via Cassia at Torrenieri. From there it would be relatively straightforward to turn NW in the direction of Siena, NE towards the ceramic production site of Torrita di Siena, or E for Chiusi (Fig. 17.19).

Within the context of the suitability of this route for laden beasts of burden, its slope to Torrenieri rises very gradually from 130 to 290 m asl, first over Orcia terraces and then over slightly undulating Pliocene hills, before flattening out at Castelnuovo dell'Abate, whence it follows the gentle Pliocene hills until 1 km before the village. From just before Castelnuovo, the morphology of the landscape gets harsher: inevitably one has to cross a 5–6 km stretch of geologically older, thus steeper, slopes, before reaching the gentle Pliocene hills that border the Val d'Asso, which lead without much effort to the Via Cassia at Torrenieri. Local informants identified several possible routes from Castelnuovo, and several were prospected by car and on foot. The most feasible route passes by Palazzo/Palazzetto to the *poderi* Colombaiolo and Spereto (Fig. 17.20), before meeting the Via Cassia at Torrienieri. The road stays at a level of 300 and 400 m asl but crosses three steeply incised valleys (the Fosso Ribusuoli, Fosso Marapietra, and Fosso Rigo). The total distance from Marzuolo amounts to around 24 km. According to our experience of walking in this landscape, noted above, this is equivalent to around five to six hours of walking, although it is likely that some of the slopes around Castelnuovo would have added to this. It seems reasonable to suggest that this route could be traveled over the course of a day and a half.

Our initial impression of this locale as largely cut off from the surrounding region was not borne out by our prospection of the landscape. In fact, the waterways that border this region function more as concentrators than as barriers, for they combine to produce a small number of "focal points" for movement. That is, in combination with the topography

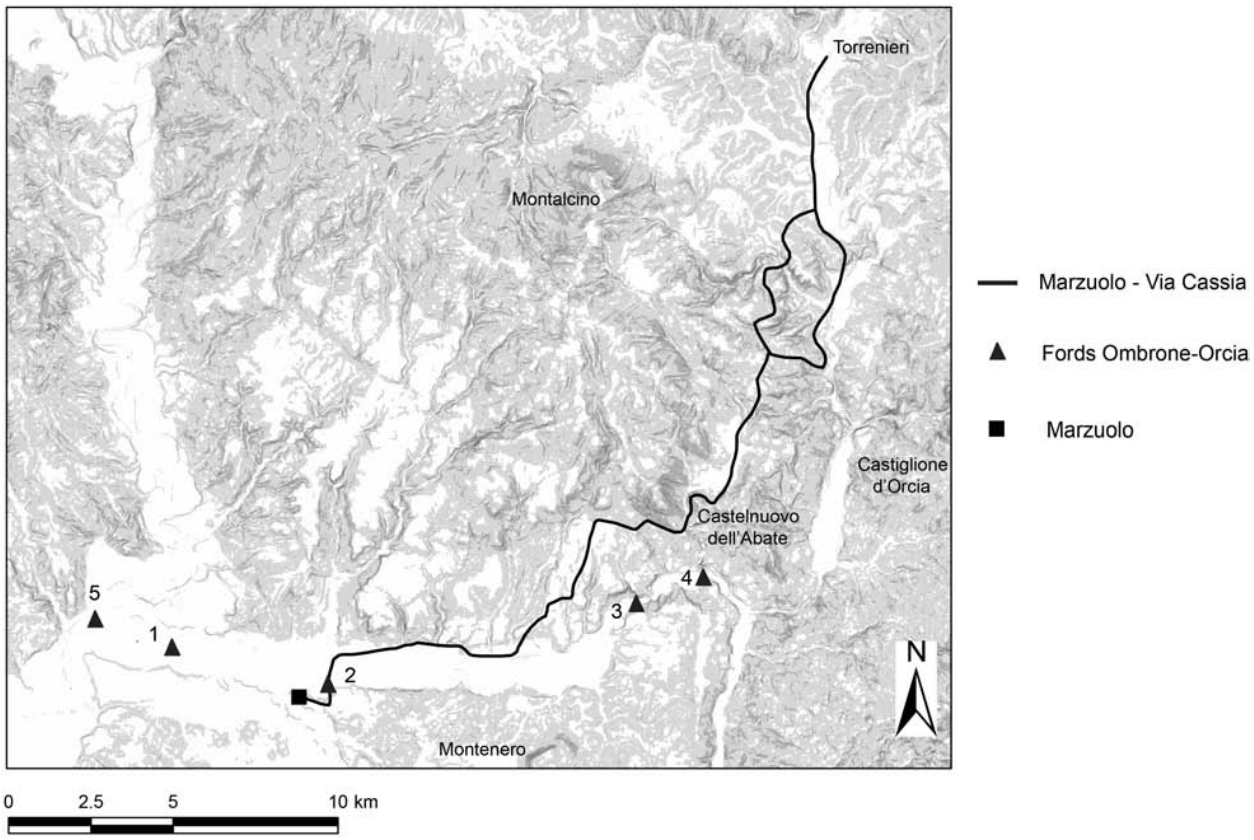


Fig. 17.19 Proposed paths between Podere Marzuolo and Torrenieri (AA/ERZ).

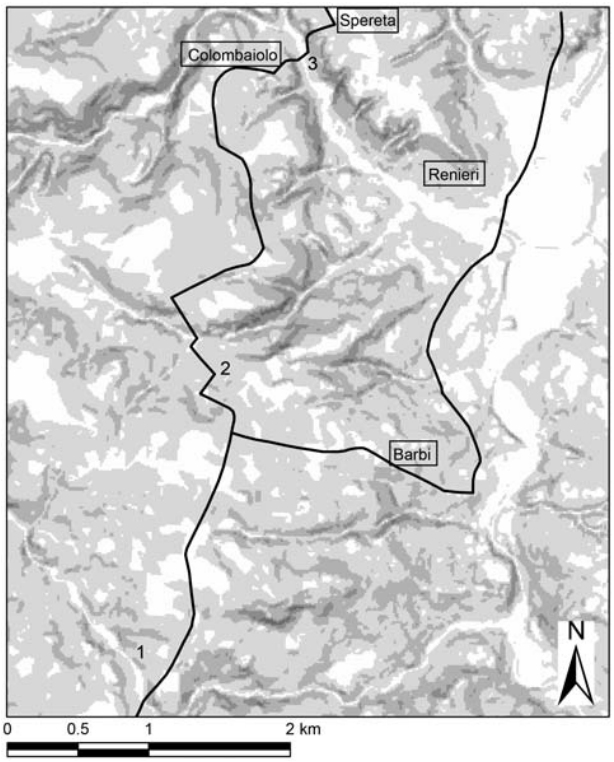


Fig. 17.20 Part of the proposed paths on the IGM topographical map; the mentioned "poderi" are circled in green; the numbers indicate the steep river valleys to cross along the western path (AA/ERZ).

of the ridges and slopes on either bank, the episodic presence of fording and/or ferry crossing points along the length of these rivers results in relatively clearly defined entry/exit points to or from the locale. It is likely that long-distance movement across and beyond this locale was seasonally inflected, both because of differential water levels and hydrological flows and because of the varying rhythms of the productive regimes in which the peasants of this locale were involved. Nonetheless, on the basis of our exploration it seems entirely uncontroversial to propose clear connections between the villa of Santa Marta and those of the region around Paganico; linkages between the town of Roselle and the micro-locales of Santa Marta/Case Nuove, Marzuolo, Pievina, and the (unexcavated) sites in the SW corner of this region; and potential markets in the vicinity of Torrenieri at a meeting point with the via Cassia for the ceramics produced at Marzuolo. These longer-distance connectivities are arguably the most visible vestiges of movement in and around our locale, but they are neither the most regular nor the most meaningful.

17.5.2 Episodic Mobility

For the purposes of analysis, we define episodic mobility across or around this locale as constituting journeys that are easily completed in a day but might involve an overnight stay or longer at one end. Naturally, this is an imperfect metric and there is a certain amount of bleed-over between this category of movement and journeys such as that between Marzuolo and Torrenieri discussed above (see Figs. 17.19 and 17.20). Nonetheless, we would argue that, because movement of this type takes place within the locale, over a landscape that is familiar, it is qualitatively distinct. Likewise, the distinction between movement at this scale and the journeys we will describe below as quotidian is fuzzy, especially given the subjective evaluation of distance discussed above. As a consequence, journeys of this sort should be regarded as intrinsic elements in the model of distributed habitation that we have sketched in Chapter 12—particularly given the possibility that sites such as San Martino might serve as episodic shelters for overnight stays, which might lengthen the distances

peasants inhabiting this region were prepared to travel for purposes of agriculture (cf. Forbes 2007:183–184). We return to the implications of these propositions below, where we discuss the relationship between quotidian movement, familiarity, and meaning. Here, we explore a series of exemplary approximations of medium-distance movement, inspired by linkages in material culture between sites or between sites and the origin points of materials discovered in them. Again, it is worth stressing that these approximations should not be mistaken for real instances of travel, but, rather, should be regarded as illustrations of potential routes around this locale.

The hypothesized routes between Pievina and Monte Amiata described above provided an opportunity to investigate patterns of mobility that traverse this locale (see Fig. 17.5). This investigation also involved evaluating the hypothesis that Monte Amiata should be identified as a source for the fuel burnt in the kiln(s) at Marzuolo. We have suggested above that the "ridge" and "river terrace" routes should be regarded as two complementary pathways across this locale, with the choice between them largely a matter of subjective decision making, combined with evaluations of the suitability of the terrain and the pragmatic reality of where one needs to go. We have already noted, for example, the difficulty that donkeys have traveling down slopes when heavily laden. If carrying cords of wood for firing kilns, it might be preferable to descend as quickly as possible to the flat river terrace rather than to spend the entirety of a ca. 25 km journey headed down slope.

The parameters established during the GIS modeling of these routes together with an assumed walking speed of around 5 km/hour provided an opportunity for evaluating mobility between Marzuolo and sites where sigillata wares were recovered both during excavation and in Ghisleni's initial survey project (see Fig. 17.7). Further, a cost-distance map of travel between Case Nuove and nearby sites was produced, working on the hypothesis that it served as a central place for the processing of agricultural and agro-industrial products. (see Color Fig. 17.10 and Fig. 5.31). Each mapping exercise produced results that allow further hypotheses about episodic travel in this locale and about mechanisms of connectivity between its various micro-locales. This latter phenomenon is illuminated also by the prospection on foot of the "ridge road" between Cinigiano and Paganico briefly discussed in the preceding section.

The complex, complementary, but incomplete ceramic chronologies of Marzuolo and the various sites in our locale on which wares sourced to Marzuolo were discovered have been outlined in Chapters 10 and 15 above. Sigillata with fabrics matching those produced at Marzuolo was discovered at the site of Tombarelle, Pievina Phase 1, and Case Nuove Phase 1.2, together with four further (unexcavated) sites from Ghisleni's initial survey (TU 166, 235, 309, 310). Additionally, on the basis of macroscopic similarities, ceramics from Poggio dell'Amore might also be traceable to the final phase of production at Marzuolo (Ch. 10; Vaccaro et al. 2017:251–252). These findings provide an opportunity to explore intra-regional connectivity in more detail. The cases of Tombarelle and Poggio dell'Amore may be dealt with relatively quickly. The presence of Marzuolo wares at these sites is, perhaps, unsurprising given their very close proximity to the ceramic workshop and the resulting likelihood that, in this distributed habitat, there was considerable overlap in the populations working, eating, and (perhaps) sleeping at each of these sites. It would seem that we observe here a material echo of the patterns of regular, quotidian movement. Likewise, Pievina is around 10 km distant on foot, a journey of around two hours via one of two spurs that connect the river terrace with the ridge road.

The presence of ceramics from Marzuolo at Case Nuove prompts more detailed exploration, for connections between zones within this locale present certain challenges. Our hypothesis that Case Nuove may be interpreted as a central place in this locale is predicated primarily upon its location along the "ridge road" that runs the length of the region, and its scale as a processing site. Further, it is worth restating that in its late Augustan/Julio-Claudian Phase 1.2 it yields extra-regional imports from Tarraco and southern Gaul, which are most likely a product of connections with Paganico and Roselle. Similarly, Marzuolo's location along the "river terrace road," together with its function as a ceramics production and distribution facility—attested by the significant proportions of imported transport amphorae, at least in the second half of the 1st c. AD, suggest that it, too, may be characterized as a central place. Additionally, faunal remains at these two sites hint at a greater

degree of external connectivity than other sites in the locale (Ch. 14). But the two routes with which these sites are associated co-exist primarily in a relationship of complementarity rather than cooperation (see Fig. 17.5). That is, walking across the locale is effected *either* by means of the "ridge road" *or* along the "river terrace road." While it would be possible to "toggle" backwards and forwards between the two by means of the spurs that descend from the ridge at more-or-less regular intervals, absent a very specific, identifiable objective that required a systematic (or wandering?) traverse of this sort, this strategy seems unlikely as a set of customary practices.

Moreover, if the objective were to deliver ceramics from Marzuolo to Paganico, and thence to markets to the W and N (or the coast), Case Nuove is far from the most natural linkage. More likely would be the route outlined above that ran along the river terrace, either crossing the Orcia relatively close to Marzuolo or hugging the S bank of the Orcia and then the Ombrone, crossing the bed of the Trisolla, then encountering Paganico at the fording point of the Ombrone in the NW corner of the locale (see Figs. 17.11, 17.16, and 17.17). We may be witnessing here complementary routes of distribution for Marzuolo ceramics. On the one hand, we find their presence at a natural "internal" destination-point, namely the micro-region containing both the seasonally employed processing site of Case Nuove and the farm-*cum*-villa of Santa Marta. While we lack any corroborating information from the excavation project underway at Santa Marta, the richness of finds in dump contexts at Case Nuove is a strong indication of the "pull" that this site appears to have exerted. On the other hand, we may postulate the presence of ceramics from Marzuolo in the region of Paganico. But Case Nuove and its associated site of Santa Marta need not have functioned as the intermediary in this movement of goods, and, indeed, the physical characteristics of the landscape strongly suggest that it did not.

This impression of complementarity is enhanced by the cost-distance map of travel to the site of Case Nuove, which reveals that the path with the lowest effort-cost from Marzuolo nonetheless still runs straight up a steep spur that meets the terrace at Podere Machiole, and then crosses the Trisolla in the middle of its course (see Color Figs. 17.10 and 5.32). This is neither a desirable nor a practicable route, especially for laden pack animals. We witness here the potential tension between physical topography, human decision making, and pragmatism, for the site is well-placed both as a visible focal point in the locale and as a location to minimize the loss of productive land and, perhaps also, to take advantage of winds to aid in the threshing process—a phenomenon strongly suggested for the late antique phase, though not well supported in this period (cf. Ch. 5). At any rate, our hypothesis that this processing site was a seasonal focal point in this locale encourages the generation of plausible routes towards it. Prospection of the region by car and on foot suggests that viable routes between Marzuolo and Case Nuove were rather circuitous: either first ascending a spur to the "ridge road" in the vicinity of Pievina and then descending the ridge; or overshooting the site along the "river terrace road" to the vicinity of Sasso d'Ombrone and then approaching from the NW. The ease of the first route once Pievina is reached signals the plausibility of peasants exploiting sites along the ridge making the decision to process their materials at Case Nuove. The practicability of the latter route, meanwhile, may be tentatively supported by reference to the presence at Case Nuove and in the nearby field drain at Colle Massari of marly limestone rocks that have been sourced to an outcrop located above Sasso d'Ombrone. On the other hand, the absence of this limestone from other sites in the locale may, equally, be evidence for a relative lack of interpenetration between the two zones.

Of course, efficiency and lowest energy cost are by no means the principle metrics that should be employed in evaluating connectivity in this region (cf. Forbes 2007:180–181), and we have already stressed both the pragmatic dimensions of connectivity in the case of crossing a river such as the Zancona and the subjectivity of decision making among peasants when it comes to the distances they are prepared to travel. The ceramic chronologies of the sites of Case Nuove and Marzuolo between the late 1st c. BC and the late 1st c. AD reveal a rather complex relationship between the two. But movement of goods around the region does not appear to have been irresistibly or inevitably hindered by physical barriers. This conclusion enhances our impression that the peasants of this region possessed some degree of agency when it came to the choices they made both about their mobility patterns and about their material culture. As we have already argued (Ch. 15), they were consumers, but not entirely passive ones.

17.5.3 Quotidian Mobility

Our analysis of the experience of living in and moving around this landscape assumes that it is the "background noise" of everyday mobility, the innumerable and largely invisible individual journeys that, in the aggregate, represent the most fundamental expression of a community's engagement with its landscape (cf. Nutley and Thomas 1995:24–25). In this particular locale, quotidian movement encompassed the morning and evening walks between residences, agricultural fields, drains, and other installations, the daily rounds overseeing the grazing of sheep and goats, the regular forays to forested areas to hunt for game or harvest woodland resources, and any of a myriad other small-scale, largely unplanned instances of walking around and across the landscape. Mobility of this sort is almost impossible to recover archaeologically. But it is fundamental to the model of distributed habitation that we have outlined (Ch. 12) and essential to the successful execution of the agricultural strategies discussed (Ch. 13). In what follows, we identify a collection of proxies for quotidian movement, posit a series of modalities that such movement might take, and signal the implications of taking that movement seriously for the present project and for the analysis of peasant lifeways more generally.

The most direct evidence for everyday mobility in this locale is provided by the archaeobotanical remains from the various sites. It is, perhaps, a rather obvious observation that a significant proportion of the (relatively limited quantities of) cereals, legumes, and fodder crops that these remains attest were transported to those sites by means of human agency, whether deliberate or accidental (cf. Auffret and Cousins 2013). But the implications of the presence of these materials in living surfaces or among the remains of cooking fires in terms of everyday patterns of mobility is rarely acknowledged. Two fundamental questions present themselves, each predicated on the assumption that landholdings were fragmented, whether as a result of a dynamic market in land or as a consequence of flexible agrarian strategies for managing risk and reward. First, how widely dispersed should we imagine an individual farmer's holdings to have been? Put another way, how far would an individual farmer be prepared to walk to a field under cultivation? Any answer we offer to this first question inflects our response to the second, namely how should we imagine travel around or between these fields and the farmer's residence: a linear there-and-back-again trip, a circuit from field to field (analogous to the "trip-chaining" described in some comparative literature), a combination of the two (cf. McLafferty and Preston 2010)?

We have employed the model of distributed habitation to emphasize the necessary interconnections between a range of complementary agricultural, artisanal, and central dwelling sites in this locale. This model demands regular, daily mobility between those sites, and we possess much of the data necessary for a hypothetical (re)construction of such mobility. We have established above rough orders of magnitude for quotidian travel based on our own experience and comparative ethnographic evidence. The physical characteristics of the region present a collection of constraints that are likely to have interacted with human decision making in determining where and how peasants and their animals might walk, and we have incorporated those constraints into our GIS models.

However, we lack the fine-grained detail to establish, for example, concrete relationships between the sites of San Martino and Tombarelle, or Poggio dell'Amore and Pievina. Likewise, our effort cost map of connectivity to Case Nuove reveals the relative ease with which the inhabitants of sites of the Piani Rossi might make their way to the hilltop processing site and our viewshed analysis reminds us that it was a visually significant feature of the locale (see Color Fig. 17.10 and Fig. 5.33). But it is impossible to determine whether crops were transported there directly from fields or first collected at a central storage facility. The problem is compounded by the absence of installations recognizable as granaries at the majority of our sites. Thus, we cannot definitively or quantitatively reconstruct the particular characteristics of the distributed habitation network for any of our sites.

But we do, perhaps, catch suggestive hints of the movement that such a network involved in the evidence for building stones from Montenero at the sites of San Martino, Poggio dell'Amore, Podere Terrato, and Pievina (see Fig. 17.6). As we have stressed above (Ch. 16), practices of spoliation in this locale make it unlikely that these building stones traveled directly from their origin point to their findspot. Nonetheless, the distances involved and the routes taken over the

terrain may be taken as plausible proxies for daily travel between these sites. The distances from Montenero to the sites of Pievina, Podere Terrato, and San Martino measure between 9 and 10 km, that is, a two-hour investment of time each way. This is, perhaps, sitting at the outer limits of what might be considered a plausible regular daily commute, but if one were to remain overnight at a work hut (as we have hypothesized for San Martino above on the strength of the cooking pots), then it is easily imaginable as part of a regular round of work stretching over several days. Meanwhile, from Montenero, the route to Podere Terrato goes past Poggio dell'Amore, the two sites separated by some 3–4 km. This allows us to imagine a potentially close relationship between Podere Terrato (perhaps, in its historical context imaginable as a "central place") and Poggio dell'Amore (a "satellite" to Podere Terrato).

Alongside regular movement between production sites we must imagine also movement by flocks of sheep and/or goats (cf. Ch. 13).The importance of ovicaprids for economic regimes is indicated by fodder and animal defecation at the sites of San Martino and Poggio dell'Amore, together with data indicating pasture and fodder crops in the immediate vicinity of these sites and of Podere Terrato. Again, we have no evidence for where, how, and for how long these herds grazed, how far they traveled in a day, a week, or a season, or what happened to them during the winter. But comparative evidence from a variety of lowland environments in Thrace, Macedonia, and Poland suggest ranges of between 5 and 8 hours spent grazing, covering a total, wandering, distance of between 4.5 and 5 km (Chrupek et al. 2006; Loridas et al. 2011; Karasabbadis et al. 2014). In most of these contexts, it is explicitly stated that the herd issues from a permanent or regular location each day to graze. The only study to measure the point-to-point distance from that location to the furthest away place reached on any given day yields a result of around 1.5 km in the semi-arid region of the Negev (Arnon et al. 2011).

The distances involved in these rough orders of magnitude resemble the distances encompassed by the mobility study concerning connectivity between the temporary work sites of San Martino and Poggio dell'Amore (see Figs. 17.3 and 17.4). The sites are around 1.5 km from one another, while the two posited walking routes traveled around 5 km. Both sites attest the presence of ovicaprids, and we have hypothesized above that the huts themselves might have served as occasional shelters for both shepherds and (at least some of) their sheep. Again, sheep do not walk purposefully from one site to the other as we did when we ground-truthed routes between these two sites. But the area encompassed by those routes (ca. 8 km^2, assuming a circumference of around 10 km) may offer a rough approximation of a hypothetical range for a small herd of sheep. If we imagine episodic relocation of such a herd around this landscape—from season to season, year to year, or according to the longer-term dynamics of a convertible husbandry regime as outlined in Chapter 13—then we may gain an impression, however imperfect, of shepherding in spatial terms, in this locale. If we then place these metaphorical representations of sheep grazing activities alongside the experimental reconstruction of routes between sites utilizing the Montenero data, we may be able to catch glimpses of the complementary, partially overlapping, yet distinct patterns of movement between agricultural, pastoral, and woodland management activities that the topographical features of the landscape and the particular economic regime of its denizens combined to produce. These patterns are likely to have complemented the patterns of movement that we have cautiously posited between Marzuolo and sites where ceramics produced there have been found.

17.6 Conclusions: Meaning and Familiarity, Time, and Place

The fine-grained detail of these exercises in imaginatively reconstructing walking routes permits us to "thicken" our analysis of everyday movement in and around this locale—even if that thickening is self-consciously speculative. We may suppose, for example, a combination of out-and-back trips for specific, individual purposes such as weeding or tending of olive trees or woodland resources; and trip-chained movement around agricultural holdings, perhaps strung out over days or weeks by taking advantage of the shelter provided by small work huts such as at San Martino and Poggio dell'Amore. We should expect that some of those trips were multipurpose, as perhaps is exemplified by the evidence for stones sourced to the vicinity of Montenero at the

sites of San Martino, Poggio dell'Amore, Podere Terrato, and Pievina. Others, for example those indicated by the presence of Marzuolo ceramics at Case Nuove, may with caution be interpreted as undertaken to achieve a single objective.

What unites these journeys, at least in the late Republic/early empire, is that they are all carried out within and across landscapes that are intimately known and regularly experienced. That knowledge has been built up through daily journeys alongside sheep and goats as they grazed pastures and woodland fringes; regular trips between site or sites of residence and fields sown with cereal, legume and/or fodder crops; episodic returns to the points of origin of clays and building materials, or to huts or other buildings from which such building materials might be spoliated; seasonally inflected journeys to processing sites such as Case Nuove; and journeys undertaken to collect or distribute ceramics produced at Marzuolo, an installation that is never more than around a half-day's travel from any point in this locale, but which is nonetheless accessible with varying degrees of ease according to the direction one is traveling.

Journeys of this kind—what we have termed the "background noise" of everyday mobility—have attracted only limited attention in the scholarly literature (cf. Forbes 2007:28). More commonly, attention has focused upon long-distance trade, pilgrimage, processions, and instance of ceremonial or ritual travel. Certainly, it is intuitively simpler to extract kernels of meaning, intimations of claims to power, and expressions of individual and collective identity from journeys of these sorts (e.g., Tilley 1994). As a consequence, phenomenological approaches to landscape have tended to revolve, whether explicitly or implicitly, around notions of appropriation and to entail concretization of a sense of distance and separation between the traveler and the landscape over which they travel (cf. Forbes 2007). However, the scholarly attention devoted to these journeys is disproportionate to the regularity with which they occurred and to the numbers of individuals they implicated. Moreover, journeys of this sort do not appear to have been common in the region under discussion here.

We have suggested throughout this chapter that there existed in this locale a high degree of mobility, undertaken on a variety of scales by the majority of the population, as a part of their everyday practices of living. Constant, repeated mobility has recently been identified by Ingold as fundamental to the lived experience, which he defines as "to be embarked upon a movement along a way of life....Along such paths, lives are lived, skills developed, observations made and understandings grown" (Ingold 2011:12). Paths interact with other paths to form meshworks, and movement along and between those paths—both physically and metaphorically—instantiates the state of being, expressed both consciously and unconsciously as an aggregation of individual decisions. We would argue, further, that the journeys we have described in this chapter, the collection of small-scale, repetitive trips that constitute a peasant's quotidian existence, represent a particularly intimate means both to inscribe meaning into the landscape, and to derive meaning from it—that is, to transform it from an abstract space to a socially constructed place (Ingold 1993, 2011; Gibson 2007; cf. Cresswell 2006). That sense of intimacy reinforces and is reinforced by the feeling of familiarity that infuses each individual trip, a familiarity that emerges and evolves over the lifetime of an individual, and, by extension a family and a community (Forbes 2007; Gibson 2007). We have already emphasized the perils of assuming that our perceptions as periodic visitors to this landscape in any way resemble those of its more permanent inhabitants, whether contemporary or ancient. Nonetheless, we must acknowledge that, for its inhabitants, this locale was a place imbued with memories and experiences, no matter how unrecoverable we may deem those memories and experiences to be.

The link made here between time, place, and mobility is deliberate. In a recent meditation upon this relationship, it has been suggested that mobility serves both to temporalize space and to spatialize time (Cresswell 2006:4). This observation allows us to enlist Ingold's notion of the taskscape as a mechanism for understanding how the actions of individuals and groups serve as markers of meaning, simultaneously defined as social constructs in both time and space (Ingold 1993:158–612; cf. Vergunst and Árnason 2012:148). The realization that the temporality of a landscape is socially constructed prompts investigation of the various scales at which that temporality might be interpreted. We briefly sketch a series of complementary temporalities that inform and structure peasant lifeways in this locale.

The first, the familiar trajectory of birth, growth, and death along which any individual's life path

inevitably travels, is entirely unknowable to us. Nonetheless, we may surmise that familiarity with a landscape develops or, perhaps, evolves both over time and with reference to the set of spaces with which it is concerned. We may therefore reasonably ask how the familiarity of individuals with the landscape(s) in which they lived might have been expressed over time. In this context, it is tempting, for example, to speculate about the identity of the shepherds who accompanied the sheep and goats who wandered parts of this locale and sojourned from time to time in huts like San Martino and Poggio dell'Amore. Were they children, entrusted with responsibility for tending the household or community's sheep until they developed sufficient strength and stamina to take on the various tasks associated with agriculture? Were they designated members of the household or community, who carried out the role throughout their lives? Or (most likely, perhaps) a combination of the two? For our present purposes, these alternative patterns of labor and their corresponding patterns of mobility produce complementary collective experiences of space. Perhaps an individual's knowledge of the region aggregated over time as they took on new and different roles, gradually expanding their experience of the locale over the course of life. Alternatively, and as attested in some comparative ethnographic literature, different individuals possessed complementary stores of knowledge and experience of the locale according to the activities they undertook, the pathways they traveled along regularly, and the decisions they made with reference to those pathways (Fitzjohn 2007). In each case, a distributed habitation model is central to the experiences of both individuals and the community, but the specific implications of that model are expressed in rather different ways.

A second temporality has woven in and out of our discussions throughout this chapter, namely, the annual seasonal cycle that informed the work calendars, ceramic production schedules, travel strategies, and market behaviors of this world. Broadly speaking, a notional mobility calendar for this region might involve patterns of relatively intensive movement between and around fields in the spring and into the summer, when harvesting and processing of crops would have taken place. This would have likely overlapped with the periods of highest intensity in the ceramic production workshop at Marzuolo, entailing regular movement to and from Monte Amiata to obtain fuel, as well as travel within and beyond the bounds of the locale to distribute the wares produced there. In fall, it is likely that peasants traveled to sell some surplus goods, to distant fields to harvest and then press the fruits of that harvest, and perhaps also engaged in hunting activities. Winter was the period of least and shortest-distance movement, perhaps involving limited stubble grazing for herds of sheep and goats. As a consequence, we must imagine that the peasants of this region possessed an intimate knowledge of seasonal changes, and expressed them not only in cropping, sowing, and animal management strategies but also in decisions about when, where, and how to travel, practices of tending drains to manage water runoff, and so on (cf. McCarthy 2013). Thus, again, mobility and labor patterns are intimately interconnected.

Certainly, waterways in the region changed their character dramatically from summer to winter, with the result that travel both beyond the bounds of the locale and within it is likely to have been severely circumscribed during the colder, wetter months of the year. This seasonal fluctuation in the depth, rate of flow, and path of rivers also has implications for when and how individuals or groups might be involved in clearing brush and maintaining paths at points where those waterways might be crossed. We have already observed that the agricultural and ceramics production calendars are likely to have overlapped closely. It would appear that practices of tending routes should also be included in our calculus of the seasonal rhythms of lifeways in this region. Moreover, tending of routes has in recent scholarship been identified as "an embodied, mediated, meaningful, and collective practice" (Gibson 2007:78), that is, as both an expression of and a response to an intimate, ongoing relationship with the landscape, manifested in a repeated and repeatable set of actions (cf. Dobres 2000:152). Here, then, regular and episodic mobility, undertaken with specific purposes in mind and envisaged as a chain of trips around a particular part of the region, has the effect of confirming the mutual interdependence of the landscape and the population that dwelt within it.

Finally, there is a third temporal dimension to this place, namely the few short generations between the late 1st c. BC and the mid-1st c. AD, during which time the collection of residences and huts, industrial

and agricultural installations coexisted in this locale, and constituted that distributed habitat which is the distinctive feature of the region's peasant lifeway in this period. We have argued in Chapters 12 and 13 above that we can observe in this region a moment of intensification, consonant with contemporaneous processes discernible elsewhere in Italy and the Mediterranean. But what of the other period attested in our excavations, that is, late antiquity? What does the archaeological record reveal of labor and mobility, familiarity, knowledge and meaning of this locale in that period? The granularity with which we can answer this question is nowhere near as fine, for, among our excavated sites, 4th and 5th c. activity is attested only at Case Nuove, Pievina, Marzuolo, and Tombarelle. As demonstrated in Chapter 12, what data we do have from those sites can be statistically manipulated to produce rather different pictures of the nature of late antique dwelling in this locale. But, already, this paucity of sites signals a contrast with the earlier period. If there are sites comparable to San Martino or Poggio dell'Amore, indicators of a dispersed model of living and working in this late antique landscape, they do not appear to have been located in the same places as these late Republican/early imperial sites. And small surface scatters analogous to those overlying these episodic huts or worksites were not discovered during Ghisleni's survey of the region.

Meanwhile, the small finds and geological materials from 4th and 5th c. phases suggest a different articulation of the relationships between occasional, episodic, and quotidian mobility in and around this locale (see Chs. 12 and 16). The contrast with late Republican/early imperial phases is especially evident in the choice of building stones (cf. Table 16.1). For the earlier period, where the pattern of distributed habitation combines longer-term and shorter-term structures, we observe a complementarity in both the number of different stone types and the distance those stones have traveled from their origin points. More permanent structures tend to comprise a smaller number of different stones, drawn from further afield, while sites at the more temporary end of the habitation spectrum contain a larger number of stones with closer origin-points. We have emphasized above that this evidence is most likely an indicator of recycling practices, the dismantling of older structures in order to build newer ones, rather than a direct attestation of point-to-point travel for the specific purposes of collecting building materials. Nonetheless, in the late antique phases of our sites, this heterogeneity in both the number of stones and their origins is much reduced. Indeed, at the 4th and 5th. c. phases of Pievina and Case Nuove, only one type of stone was recovered and the distance to origin-point was much smaller, as compared to late Republican and early imperial phases. It seems likely that this contrast reflects a fundamental change in the regularity of episodic mobility around this locale.

The similarities between late antique ceramic assemblages at Pievina and Roselle, a catalyst for contemplating connectivity between this region and the nearest urban center, offers hints of longer-distance mobility. Our initial imagination of this connectivity is enshrined in another image similar to the one with which we began this volume, but this time illustrating the site of Pievina (see Fig. 4.11): we began from the hypothesis that the inhabitants of this locale did not actively seek out goods but, rather, traveling merchants transported them around the region. This is certainly possible, although the particularities of travel around this locale, especially the rather tightly constrained points of connectivity between the various micro-locales explored above, would suggest that this model is rather more complex than we had initially imagined. If a model of this locale as principally a passive consumer of goods deriving from Roselle in late antiquity were to be embraced, we would still argue for the coexistence of the three complementary entry points identified above, namely in the vicinity of Campagnatico, at Podere de Noce, and to the west of Marzuolo. These three entry points would respectively serve the cluster of sites located south of the ridge, the region comprising the sites of Santa Marta and Case Nuove, and the (seeming) farm houses of the Piani Rossi.

If, on the other hand, we were to posit travel by the inhabitants of this region to obtain those ceramics, we may imagine that, for the N and NW zones, at least, the area around Paganico continued to function as a natural intermediary point, with mobility again focalized around fording points in the NW corner of the locale and at the western end of the Orcia terrace in the vicinity of Marzuolo or, for Tombarelle, perhaps a little further west (see Figs. 17.11, 17.16, and 17.17). This hypothesis encourages consideration of the episodic dimension of mobility across the locale, since we estimate the distances from Pievina

or Tombarelle to Paganico to be around 20 km and 12–20 km (depending on where one crosses the Orcia) respectively. A three- to four-hour walk each way from the Piani Rossi is certainly imaginable as a there-and-back journey. From Pievina, meanwhile, the journey passes by Case Nuove and Santa Marta, and encourages us to consider a burgeoning influence for this complex in the period, especially when we consider the richness of finds in the dump contexts of this phase and the stronger evidence for the use of Case Nuove as a hilltop threshing site (see Ch. 5).

The faunal evidence for late antique phases indicates an increase in the proportion of ovicaprids relative to pigs and cattle. We may countenance a continuation of the patterns of quotidian mobility, entailing an intimate, ongoing engagement with the land that we have posited as a part of shepherding in this locale. Meanwhile, the archeobotanical evidence from Case Nuove (Phase 2) and Tombarelle (Phase 3) suggests that, in this period, pasture is present in greater proportions in the vicinity of these sites than it had been previously. Cereals are attested too, but the most robust data comes from dump contexts (see Ch. 13), meaning it is difficult to draw any firm conclusions about relative proportions or to offer any well-supported propositions about the underlying exploitation regime.

Our data for the period is limited, but it is hard to avoid the impression that this locale is less integrated than in the period that has been the principal focus of this chapter. Patterns of occasional, episodic, and quotidian movement can be glimpsed, but they are not articulated and expressed in the same ways, nor with the same degree of coherence. It would seem, then, that contraction of economic networks, and the accompanying localization of production strategies, in this locale at least, manifested not merely as a reconfiguration of long-distance market activity and the reorientation of pastoral practices. Rather, these processes were also encoded in fundamental changes to patterns of episodic and quotidian movement around this locale, themselves intimately connected to strategies of economic exploitation. In particular, we observe a marked contrast in the quantities and diversity in origin points of building stones. The collection, transportation, and use of building stones form part of a nexus of activities dispersed in both space and time which, collectively, call a building into being (cf. McFadyen 2008:308–309). While we catch only glimpses of those practices here, we should imagine that changes in the distance traveled to obtain materials and in the time spent over that travel will have had an impact upon other elements in that nexus of activities.

If, as we have argued implicitly throughout this chapter, those patterns of mobility function to bind time and place together into a collective expression of identity, then two implications follow. First, the relations that the denizens of this world enjoyed with their landscape were markedly different in the two periods for which we have evidence. The earlier was characterized by coherence and integration, the locale rendered known and familiar by regular travel that operated simultaneously at the occasional, the episodic, and the quotidian scales. Late antiquity yields evidence for each of those scales, but they do not cohere and complement one another in the same way. Whether the result is a locale characterized by fracture and fragmentation would require a clearer understanding of the dynamics of mobility and exploitation in late antiquity than we have been able to achieve in this project. But it is certainly the case that we cannot judge the 4th and 5th c. by standards developed with reference to the late Republican and Augustan periods.

The second implication follows closely upon the first. While the physical characteristics of this region appear to have changed little over a period of several thousand years, its collective identity as a locale has undergone significant changes, up to and including the present day, a factor to which we have alluded earlier in this chapter (cf. Gaggio 2016). As a consequence, we can accept neither the notion of peasant as a timeless unchanging category (cf. Ch. 1), nor the idea that the temporality of a landscape can be regarded as a constant, abstract phenomenon, somehow separable from the particularities of the individuals and groups dwelling within it (*contra* Ingold 1993). Mobility around and across this locale, the ways in which space has been rendered meaningful in time and time rendered meaningful in space, is historically contingent and specific.

18

Conclusions

The Roman Peasant Reframed

Kim Bowes and Cam Grey

The two photographs with which we began this book, the Pontina peasant girl and the Inklink reconstruction of San Martino, are twin objects of atavism—both seek some kind of return to a peasant past and imagine that the present can access that past in some more or less unproblematic way. The contents of this book have, we hope, addressed that urge in some ways by laying out a path to access Roman peasants. But it is one across unfamiliar landscapes, populated in unexpected ways, and through very specific temporal rhythms. If, as Ingold would have it, the passage of time is the unifying structural principle that shapes lives and landscapes, this project has demonstrated that the time of these Roman peasants, as well as their activity and landscapes, has an insistent particularity that belies the notion of an eternal peasant and introduces us instead to a historically specific one. The atavism and activism with which we began has, in the process, become complicated by an unfamiliar, very particular "then."

This concluding chapter both outlines some of the lessons learned during this journey and situates them within the broader arcs of the historiography with which we began and of current debates in Roman history. The character of the Roman landscape, debates about Roman demographics, the practices of Roman agriculture, land tenure, urban/rural relationships, wealth and poverty are subjects that have been pursued with only limited consideration of the majority of the population who shaped them, namely peasants. With at least some peasants, from a particular place and time, added into the historical mix, how do these issues look different? Above all, how can the lessons of these insistently present, historically specific peasants offer some insights into particular late Republican and late antique moments, and thereby the character of Roman history itself? In many cases, the most important lessons may be those of contingency, specifically, cotningency of data normally regarded as absolute, of landscapes whose use is in no way environmentally determined, and of time and place all of which constantly frustrate our urge to generalize.

18.1 Landscapes

The Roman landscapes revealed by this project are quite different from those typically envisaged by historians, or those imagined and then investigated by archaeologists. Those landscapes are dominated by "houses," by habitation—a reflection in part of the modern habitus, which sees the house as the locus of cultural production, and, in part, of Latin terminologies, which seem to parse such habitations in a legible hierarchical sequence from villa to *tugurium* (a hut or cottage).

However, as the Roman archaeologist Fédéric Trément (2017) has urged, it is time to let go of houses,

or at least, houses as singular spaces of "domestic" activity, somehow distinct from places of production. In excavating eight surface scatters, from the 20 x 25 m scatter at San Martino to the 2.5 ha spread at Marzuolo, the project has uncovered only one possible "house" as archaeologists might have imagined it. Instead, we have been confronted throughout by an insistent archaeology of production. Granaries, cisterns, animal stalls, field drains, artisanal sites, and agro-processing sites loomed far larger in the landscape we investigated than did houses. In Chapter 12, we suggested that the mistake is not to assume that houses existed, but rather to assume that the peasant "house" corresponded only with a singular dwelling where all activities were concentrated. Instead, we outlined the notion of "distributed habitation," a term meant to gesture to the spatial separation between different aspects of household activity, scattered throughout specific points in the landscape. Ingold's "taskscape," glossed as activities defined in specific time and space, echoes this revised notion of peasant "house"—a domestic taskset scattered in the landscape and performed for various lengths of time, perhaps around a central point we termed the "central dwelling."

That terminology, of course, still carries with it vestiges of the assumptions about identifiable, recoverable hierarchies of "settlement," assumptions that we have noted and critiqued in the survey methodologies of projects in Italy and elsewhere. The dwelling practices of the peasants we have excavated, at least during the period with which we have been most concerned throughout this volume, were anchored to a single central place. But that central place was itself as dependent upon its "satellites" as they were upon it. The lifeways of these peasants—the "where" of where they lived—was manifested in an interconnected set of mutually implicated actions, carried out at a horizontally articulated, complementary collection of places. Those places were, on the whole, functionally specific. As a consequence, they were only rendered viable as sites of action and, therefore, of meaning by constant acts of movement between them.

While we used the specific terminology and theoretical framework of "distributed habitation" to define this idea, the phenomenon of Roman landowners owning multiple plots of land in different ecological zones and managing them separately and intensively has long been known and acknowledged by Roman historians. Our project's contribution is to locate this practice not only among large landowners, but among smallholders as well, and to recognize in it a strategy not only for managing land, but also for living in the landscape, that is, a specific way of dwelling.

The massive excavations that have reframed the Roman countryside in France have found a version or rather several versions of this phenomenon. Above all, and to Trément's specific point, they have consistently found landscapes dominated not by houses, but by the physical detritus of agricultural work: stock pens, watering holes, sheep dips, terraces, irrigation canals, presses, and kilns. This impression is deepened as botanical studies, which emphasize human-plant landscapes, not simply human settlement, are brought to bear. Farms and other dwellings were, of course, present in those landscapes. But Trément's fundamental point is that they do not characterize the Roman landscape, rather, that landscape may be defined as the network of productive activities represented by all these different spaces together. "Il' s'agit de passer de la notion d'habitat à celle d'exploitation agricole" (Trément 2017:21).

We will take up the problem of the extendability of our results specifically at the end of this chapter. Suffice it to say that the very surface data that we based this project on and whose functional definitions we found so unreliable is the best evidence for the extendability of the distributed habitation phenomenon in central Italy. Excavation is required to test the hypothesis, but we suggest that the small (under 0.5 ha) scatters that make up the majority of scatters in most central Italian surveys (Launaro 2011) have a strong chance of representing not only houses, but also these productive spaces. As we noted in Chapter 12, in southern France, the same phenomenon has actually been excavated and hypothetically associated with intensive stock rearing practices. Here, then we encounter strategies that look similar physically but have different socioeconomic expressions according to the circumstances of their locales. In both places, the phenomenon cannot be limited to elites and "villa satellites," as sometimes supposed (Ikeguchi 2006). Rather, it should be understood to extend all the way down the socioeconomic scale. Outside central Italy and southern France, far less is known: the huge datasets in England and northern France point to other modes of dwelling, namely

ditched farmsteads with the whole productive activity concentrated and bounded in single sites.

As will also be taken up more fully below, even in our locale, the phenomenon of distributed habitation is short-lived, a product of a particular late Republican/early imperial moment of peasant dwelling, which is finished by the later 1st c. AD. Thus, as a mode of dwelling and doing, it is another aspect of peasant experience which is historically particular. We would argue that particularity can, indeed should, nonetheless be analyzed using a common heuristic framework.

18.2 Demographics

The last two decades has witnessed a surge of interest in Roman demographics, itself spurred by the new cliometric shift in Roman economic history. Departing from the classic studies of the last centuries (Beloch 1886; Frank 1924), the new arguments have revisited the same data to arrive at two rather different interpretations of the Italian population in ca. 28 BC: on the one hand, a conservative "low count" of around 4 million free persons (Frier 2000; Scheidel 2001; Ligt 2012); on the other, a much higher count of 14 million (Lo Cascio 1994; Kron 2005b). A middle count has tried to split the different (Hin 2013). Given the intractable nature of their differences—the debate hinges, in particular, on evaluating the reliability of Polybius and whether the Republican census counts did or did not count women and/or children—both camps have had recourse to, and in part based their arguments on, the putative material effects of their models. The high counters point to increasing levels of Italian urbanization and the potential positive impact of climate change; the low counters to the absence of any major technological innovations that would enable such high populations. Meanwhile, both camps make use of the ambiguous skeletal data which describes either healthy or unhealthy Romans, depending on the study (see above Ch. 14). That these arguments quickly become circular has not stopped a wave of such work in which new forms of evidence for demographic impact are used in support of one or the other side of the debate.

Despite a robust critique of the use of field survey data for demographic purposes (Bintliff 2002; Osborne 2004), archaeologists and historians have turned to Italian (and some North African) surveys to weigh in on the question (Witcher 2008; Fentress 2009; Launaro 2011; Mattingly 2011). As it is widely accepted that the majority of Roman populations were rural, the datasets from rural surveys should, they argue, provide a precious, readily quantifiable source for rural population numbers. All these studies admit the challenges that confront this data: the difficulty of comparing surveys carried out with different methodologies, the arbitrariness of population numbers assigned to particular site types, and, what is regarded as most serious, the likelihood that surface survey misses a certain, potentially significant, percentage of sites. Recent efforts to get around these problems have tried to normalize the data and look only at trends—greater or fewer sites over a specific period of time, leading to arguments for rising, falling, or static rural population numbers.

As the only attempt to excavate these scatters, our project provides some useful cautions regarding the utility of survey for demographic modeling. Most importantly, it has demonstrated that some percentage—potentially even the majority—of these "small" scatters do not represent unique population centers at all, but rather are productive activity sites being used by the same people represented by other sites. The implications are obvious: in addition to undercounting missing sites, these surveys are at equal risk of overcounting small sites by assuming that all scatters represent unique population centers. As noted in Chapter 12, if the implications of distributed habitation are taken into account, the population calculations of the major studies should, at the very least, be adjusted between 13 to 36% downward. It may, on the other hand, be argued that it is these smallest, productive sites which are most at risk of being missed in a given survey pass, as their material footprint and visibility are most subject to the exigencies of variable plowing cycles (Terrenato and Ammerman 1996). Thus, the fear of undercounting missing sites can, perhaps, be diminished. Nonetheless, the impossibility of knowing to what degree each variable should now be adjusted upward or downward adds to the already considerable difficulties.

In a sense, distributed habitation and its knock-on effects should offer support for the lower-count models: all those dots on the map probably do not equal people. But caution should be advised. As Scheidel has noted, there are already so many problems with

the low count calculation that its principal virtue lies in its being the least implausible (Scheidel 2008). Furthermore, in our area, as in some others, a certain demographic increase (in our case from virtually nothing) may also accompany the expansion of productive sites. Distributed habitation's real contribution is to strip away an uncertain number of sites from a dataset already riven by a major number of uncertainties. That is, our findings add nothing to the precision or reliability of these counts. Rather, they actually diminish their value, even as rough order-of-magnitude estimates. Better, we would argue, is to add distributed habitation to the already long list of strikes against surface survey as a reliable demographic dataset and abandon the effort all together (cf. Scheidel 2008; Ligt 2012). The phenomenon we have labeled distributed habitation does speak to demographic issues, but it does not help and may fatally doom the counting effort.

Our findings might be more useful in considering a particular component of the demographic debate—the argument that in the early and middle years of the 2nd c. BC, central Italy experienced a manpower shortage. The evidence for this comes largely from Appian and appears in the tense and rhetorically charged circumstances surrounding the Gracchan land reforms. Appian claims that the devastation of the Second Punic War left much land abandoned, which, although promised for use by small-scale agriculturalists in a share-cropping scheme, was ultimately taken over by the wealthy and used for slave-run estates. The upshot, he claims, was a peasantry pushed off the land and population decline in the countryside (Appian, *Bell. Civ*. 10). Tiberius Gracchus's subsequent land reforms in 133 BC, both Appian and Plutarch later insist, were as much an effort to guarantee sufficient manpower for military levies as to get peasants back on their land (Plutarch, *Vit. Ti. Gracch*. 9.4–5; 8.7).

Some historians have found confirmation for this narrative in excavations like Settefinestre, whose 1st c. BC villa, allegedly based on the exploitation of slave labor, seems to gesture to the slave-driven crisis of Appian's account (cf. Harris 2007:523–526). Others have correctly noted that Settefinestre and its ilk do not really get going until a century after the reforms, and that the census data from the Gracchan period belies population decline (Ligt 2012:165). Survey-derived hints of declining site numbers in the Tiber Valley around this time have also been plausibly explained as the product of ceramic supply, rather than falling manpower (Patterson, Di Giuseppe, and Witcher 2004; Witcher 2008). Meanwhile, Appian's account has been parsed as an effort at systematizing use and ownership of the *ager publicus* (Jakab 2015). It has also been reread as a retrojection of present circumstances on past events in which Appian reread the land reform acts of the 2nd c. BC as having been occasioned by circumstances (large villas) of his own day (Gargola 2008).

Our project's data on distributed habitation is physically distant from the real focus of the Gracchan debate, which is generally taken to have been somewhat closer to Rome. Moreover, we have repeatedly emphasized throughout this volume the particularity of each locale and each set of peasant lifeways. Nonetheless, our results may contribute something to the problems that attend that debate. In many areas, including our own, the proliferation of small sites that we see as part of the distributed habitation phenomenon emerges around this time, the middle and later years of the 2nd c. BC. As noted above (Ch. 13), and discussed below in more detail, distributed habitation does not necessarily reveal either a spike or a decline in population, but rather a moment of intensified use of the land by smallholders moving around between disparate plots and building specific installations for their most efficient exploitation. Rather than being pushed off their land, the peasants we have found are, at this moment, in a state of heightened quotidian and middle-scale mobility, building and abandoning sites with great frequency (see Chs. 9, 10, and 17). In other words, what Appian may have retroactively identified as a demographic crisis may reflect a moment of intensification and heightened mobility.

18.3 Agriculture and Productivity

The attempt to make our data speak to historical problems like the Gracchan land reforms forces us to see our data for what it is, as opposed to what we wish it was. Rather than providing any quantifiable input into demographic debates, what the data best describes are particular modes and chronologies of agricultural practice, which form part of the broader suite of activities carried out within this landscape by its inhabitants.

As described in Chapter 13, the debate surrounding the productivity of Roman agriculture was previously dominated by textually based work, largely but not exclusively drawn from the so-called Roman agronomists. The tendency to view those works as manuals, and their lack of a sustained argument for profitability, productivity, or innovation, at least as compared with 19th c. versions of such "manuals," led much earlier work to a pessimistic conclusion. Jongman's (1988) monograph on the economy of Pompeii was, in a sense, a last, applied version of this strand, assuming, little use of animals, poor or no pasture, alternate year fallowing, and increased labor and decreased productivity under Malthusian population pressures. Starkly different is the most recent work, ranging from Kron's readings of the agronomists' specialized vocabulary of ley agriculture (Kron 2000), to Goodchild's (2007) masterful, if ultimately flawed, attempts to calculate productivity through multivariable models in the Tiber Valley. Wilson's (2002) arguments for technical advances, including the use of waterwheel technology, have focused principally on elites and the state; more pertinent for the peasant majority are the studies on micro-scale irrigation, terracing, and drainage projects, which find smallholders micromanaging hydrological resources using simple, age-old methods, but applied systematically (Quilici and Quilici Gigli 2009; Haas 2012; Campana 2017; cf. Ouzoulias 2014; Bernigaud et al. 2015; Reddé 2016b). This new work is generally more optimistic and more diverse in its evidentiary base than the previous scholarship, but aside from the iron ard plow (cf. Spurr 1986:27–28), it has not yet convincingly demonstrated any major agro-technological "breakthroughs," hence supporting Scheidel's claim that even modest population growth was accompanied by low standards of living.

The evidence from our project most insistently points to a major moment of agricultural intensification, part and parcel of the mode of dwelling termed distributed habitation. The tendency to build on the spot of production—be it a pasture, a panoptical point near olive/grape orchards or clay sources—and to make more efficient one's use of far-flung and diverse resources, is one piece of evidence for this moment. The evidence for rotating energy-draining crops like cereals with nutrient supplying crops like legumes or pasture is perhaps the biggest breakthrough, but this probably did not amount exactly to the kind of massive outputs imagined in early modern regimes (cf. Kron 2000). Irrigation does not form part of the picture in our locale, but drainage, just as importantly, does, with the frequent presence of field drains curating not "high-value" crops like olives and grapes, but cereals or even pasture. In sum, we have found rural smallholders engaging in all the same intensive practices admitted for elite villa owners, but on a smaller scale. What is more, as noted in Chapter 13, these "intensive" practices were intensive for labor but applied to outputs normally assumed to be selected for their non-intensive needs, i.e., cereals, animals. We are cautious about extending the specific instantiations of this intensification beyond the bounds of our locale and find it more likely that other contexts will yield comparable, but subtly different expressions of the phenomenon. Nonetheless, this is a starkly different world than that imagined by Jongman.

Comparable moments of agricultural intensification have been documented by the large scale excavations in France and Britain, albeit with a different periodicity and morphology, and this data offers further support to our impression of insistently present peasants responding with sensitivity to the particularities of their own circumstances. From the expanded temporary stock facilities that dot the Narbonnaise and the rash of tiny farms, terraces, and irrigation ditches that push into "marginal" landscapes of northern Gaul, to the extraordinary density of farms now found to surround even a tiny provincial town like Cambridge, England, the landscapes of the Roman west are now emerging as having witnessed moments of unprecedented intensive use, dominated in every instance by small farms and agricultural installations whose material culture itself is characterized by agricultural production (Raynaud 2009; Ouzoulias 2014; Evans and Cessford 2015; Smith et al. 2016; Reddé 2016b; Cayn et al. 2017; Trément 2017).

Not only is this growing picture of an intensive, late Republican moment changing our view of agriculture, but our project data also finds that moment nuanced by individual agency and locally constructed exigencies. For instance, it would be simple to argue that given such evidence for intensive practice by a peasant majority, yield and capacity calculations can be assumed to be much higher. As noted in Chapter 13, we have refused to run these calculations because,

while the evidence for potential productivity is high, so, too, is the evidence for complex, contingent decisions that make such calculations difficult, if not impossible. Land given over to pasture on a long rotation is taken out of the grain cycle and negatively impacts yield calculations based solely on grain. How to adjust these for a greater percentage of both dietary meat and animal labor is not clear. As Goodchild noted for her Tiber Valley calculations, the length of the rotation cycle is a major variable and is unknown. Still further complicating, and entirely outside her study, is the fact that archaeological sites in our project assuredly do not correspond to properties and, thus, matching a putative household unit with the archaeological data for yields per hectare proves even harder. None of these are problems unknown to the field: the value of this project has been to turn what has been regarded as noise in the data into the data itself. A landscape managed in a distributed, intensive yet extensive way is highly resistant to quantification.

The same is true for calculations of "estate size." After being somewhat dismissed, this issue has returned to the scholarship, driven by the cliometric longing for datasets on which to base calculations of productivity (Goodchild 2007:78–120; Simone 2017). The data from our project strongly suggests that, at least outside the very initial stages of a colonial centuriated landscape, calculating estate size on the basis of archaeological remains is almost impossible. The fact of distributed habitation means that archaeological signatures—never very good proxies for land ownership—become even less reliable as farmers build "sites" to accommodate activities in the space those activities happen. Peasants may own these spaces, but as one of us has emphasized elsewhere, these activity sites may also be shared (cf. Grey 2011). Interpreted in these terms, the Case Nuove press becomes a key node in a community's collective taskscape, the links that it forges with other nodes in that taskscape visible principally by means of detailed archaeological work—in this case archaeobotanical work (cf. Ch. 13). Thus, even our diagrammatic attempt to render a household's distributed habitation "properties"(see Fig 12.24) is probably misleading, as the diagram depicts activities, not ownership. Indeed, it is for this reason, among others, that we have indicated above our sense of unease with the concept of a "central dwelling" in our model.

18.4 Labor

Perhaps more illuminating is what the project data suggests about labor, and the iterative decisions taken by families and individuals about which tasks it undertakes, who does those tasks, when, and where. The phenomenon of distributed habitation locates peasant labor in the landscape, indeed in a state of constant mobility around it, even as the landscape shapes the nature, timing, and location of that labor (cf. Ingold 1993, 2011). It suggests that peasant families would have to distribute their family members accordingly, assigning special tasks to particular people in particular places. Herding may, for example, have been the domain of older children (as we know from other contemporaneous and comparative contexts) supported by on-site stables where those children may even have stayed overnight, whether episodically or at particular times of the year. Meanwhile, culling and herd maintenance operations may have entailed the involvement of more members of the household, and the relocation of the herd itself to an alternative location. Plowing with cattle would have been an adult activity, but during plowing time, the need to tend multiple separate plots might have required part or all of the family to relocate for short periods (cf. Binford 1980; Hard and Merrill 1992). The same would have been true of the harvest, the cleaning of the field drains and other moments of intensive labor requirements (cf. Shaw 2013). In both cases, perhaps, the episodic huts we have identified as connected to the maintenance of herd animals, might have been utilized, or complemented by still other episodic sites in the landscape that were not excavated by the project.

The seasonality of the agricultural year with its attendant labor surpluses and shortages has long been acknowledged as a major socioeconomic factor in productivity, demographics, urban-rural violence, and political decision making (MacMullen 1974; Foxhall 2000; Banaji 2001; Shaw 2013). In a moment of intensive distributed habitation, it takes on extra meaning. Making decisions about the deployment of family labor or the decision to hire outside labor, now took place not only in time, but also in space. Peasant families would have had to maneuver their labor resources between disparate plots, responding to seasonal exigencies, but planning for them too, so that the labor needs of non-adjacent plots might be staggered or provisions for extra-family labor made.

The complexity of these decisions was further emphasized by the example of Marzuolo, the Italic sigillata manufactory. The presence of Marzuolo and its attendant demands for labor forces us away from the classical assumptions of peasant labor as strictly agricultural. Rather, and as has been emphasized by Erdkamp (2015), the glimpse that we catch here of a late Republican landscape shaped not only by agricultural intensification and the micromanagement of dispersed parcels, but also by expanding, large-scale artisanal production, encourages us to re-evaluate the importance of non-agricultural labor to the peasant household. As the recent work on contemporary peasants reminds us, in certain periods and places, a purely agrarian definition of peasants is misleading: the late Republic/early empire in central Italy seems to be one of these moments. This, in turn, should cause us to question assumptions that peasants are ever entirely sequestered from other modalities in the economies within which they participated. After all, their enmeshment in those larger social and even political structures has long been recognized as a characteristic feature of the peasant lifeway. It would not be surprising if the same were to prove true in terms of labor—especially since, as we have argued implicitly throughout this volume, labor can only with difficulty be completely separated from other elements in the taskscape of peasants.

The unexpected presence, for example, of a large-scale ceramic manufactory in this landscape, motivated, at least in its first phase, by rural demand, and staffed in part if not in majority by locals, would have presented a major opportunity and decision for peasant families. As noted in Chapter 10, the ceramic production cycle probably took place mostly in March through October, the moments of maximum agricultural labor requirements. Families would have to choose whether to invest a member's labor in an artisanal job (potting, mixing clay, hauling water or wood) or in agricultural activities. If there was underutilized family labor, Marzuolo represented an efficient place to put that to (presumably) cash-producing use. As has been documented in other societies with conflicting agrarian/ceramic seasonal regimes, women often work in potteries, slotting in ceramic tasks around child rearing (Arnold 1985:100–103). Judging from the pins, loomweights, and other small finds, it is not unreasonable to imagine women living and working at Marzuolo, possibly together with their families. Finally, it is entirely possible that Marzuolo was, in fact, a family "business," that is, that whole, possibly itinerant families worked in the pottery in the summer months, their pots or proceeds being used to purchase their necessaries from local farmers. While ultimately unrecoverable, the menu of labor options presented by Marzuolo brings home the complex collection of decisions this particular taskscape would have embodied.

Current scholarship is making it increasingly clear that the Roman countryside was as rich with artisanal production as it was with agriculture. From the great brick and tile manufactories up and down the Tiber Valley, to the ceramics manufactories of the Pisan and Volterran hinterlands to the hundreds of small coarse ware and tile kiln sites that dotted the central Italian farmlands, ceramics alone was big business in the central Italian countryside and would have involved the same peasant families in its labor as would the great moment of agricultural intensification (Helen 1975; Menchelli and Pasquinucci 2006; Olcese 2011–2012). A New Institutional Economics-canted view has assumed that peasants would gravitate to cities with their great building campaigns, potential for better flow of goods, and centralized distribution and markets (Erdkamp 2008, 2015). The data, however, show ever more vividly that city and countryside were united in complex chains of manufacturing and consumption, and that labor would have moved quite freely between them.

This moment of intensive agriculture accompanied by artisanal opportunities describes a moment of overall labor intensification, in which peasant families would have doubled down on the agricultural potential of their own lands. Such a picture seems comparable to a Boserupian scenario of labor intensification on the land, yielding greater outputs per land unit (Boserup 1965). Boserup's insistence that the relationship between land, labor, and output is not fixed, but subject to agency and historical contingency is amply supported by the project data. On the other hand, the project has also provided important complicating factors to her model, not least Boserup's' assumptions about peasants' "primitivism" and relative insulation from market economies. Not only do the peasants of this locale at this time seem to be increasing the labor of family members through agriculture (cf. Ouzoulias 2014), they are potentially also engaging in extra-household labor for wages

through artisanal work. Agricultural labor intensification here goes hand in hand with expanded options for extra-household labor—a scenario proposed by De Vries (2008) for early modern Europe. The Malthusian pressures Boserup assumes as the causal mechanisms for intensification likewise seem mild if not absent in our locale, thus, other reasons for this intensification should be sought (see more below). Moreover, the shortened fallow she notes is replaced instead by rotational schemes which would, seemingly, not only maintain soil viability, but also invest significant resources in animals. In short, the project may provide an important case study for labor intensification outside of Malthusian circumstances among peasants participating in broader economies beyond autarky and agriculture (cf. Erdkamp 2015).

18.5 Land Tenure and Power

There is an old axiom in British archaeology that, "you can dig up a villa but you cannot dig up its land tenure" (Stevens 1966:108). While archaeology rarely reveals anything about tenurial relations, or at least anything not wholly conjectural, this has not stopped scholars from trying. From Foxhall's (1990) nuanced attempt to distinguish tenancy from direct proprietorship in Greek farms, to Launaro's (2011) masterful parsing of massive field survey datasets for evidence of small proprietors' survival, the siren song of tenurial relationships is strong. It is particularly strong in Italian archaeology, where survey data and Roman landscapes generally are read through the ancient lens of a clash between large and small landowners.

Our project took the deliberately provocative stance that we were not going to try to contribute to an already top-heavy bibliography on tenurial or power relationships in Roman landscapes. It seemed to us that arguments about death or survival of smallholders that have been made for different landscapes were shaped less by the archaeology (for the obvious reasons stated above) than by the ideologies of the archaeologists. Even the model of two Etrurian experiences—a south dominated by slave villas and vanishing peasants and a north of long-lived indigenous Etruscan smallholders (cf. Carandini 1985b; Terrenato 1998)—seemed as much a product of particular theoretical, philosophical, or cultural positions as the actual data for lived experience in these landscapes.

It is here, therefore, that our descriptive, maximalist definition of "peasants," aimed as it was at contributing to a broader theoretical debate about peasant lifeways, comes into contact with the more tightly focused debates of Roman Republican history, for the question inevitably arises: who, legally, were the "peasants" we excavated? Were they smallholders, tenants, wage laborers, or slaves? We deliberately left the definition of "peasant" open to all these categories at the start of the project, but, at its conclusion, it would seem necessary to weigh in on which of these we were principally encountering. Repeating (again) the (true) qualification that we cannot know seems inadequate, and, in fact, while we cannot know, we can state some probabilities. The high degree of mobility and investment in distributed infrastructure noted throughout our sites would probably point to smallholders. The simultaneous and specialized management of multiple parcels of land would probably not fall in the first instance to slaves or, perhaps, either to tenants, but to smallholders directly managing their portfolio of land, activities, and labor.

That being said, it is important to point out that the categories "smallholder" and "tenant" were (and are) not mutually exclusive. Indeed, recent work on rural labor patterns in the ancient, late antique, and medieval Mediterranean has stressed the existence of a "logic of deployment" for both labor and landed resources, which might entail simultaneously owning land of one's own, renting some it out to other smallholders while, in turn, renting land from other landowners—all in pursuit of the patterns of fragmented landholding which, scholars generally agree, were fundamental to peasant and non-peasant economic strategies alike (cf. Banaji 1992). Moreover, small proprietors are also attested in both literary and legal sources owning slaves and exploiting their labor in a variety of ways (cf. Hopkins 1993; Grey 2011:34–41; Harper 2011:53–58) Consequently, and particularly if we imagine comparatively wealthy proprietors fronting the capital to build the specialized apparatus for distributed activities, there is no reason why the labor that such an apparatus entailed could not have been carried out by a combination of (slave and/or free) members of the proprietor's household, members of the households of neighboring smallholders seeking to supplement income by recourse to wage labor, tenants, and even itinerant laborers (cf. Grey 2011; Shaw 2013). Again, the project data suggests

that the questions we have been asking about tenurial relationships are not merely impossible to answer, but they are not really the right questions.

The colony at Roselle and the possibility that the locale's denizens were colonists should also be addressed. As there is no precise chronological evidence for the establishment of this colony, it is likewise impossible to identify even speculatively our smallholders as a new population of colonists. The chronology of the sites we excavated range from general 2nd to later 1st c. BC dates (San Martino, Pievina Phase 1), to the second half of the 1st c. BC (Marzuolo Phase 1, Tombarelle), to the Augustan period through Claudian/Tiberian periods (Case Nuove Phase 1.2, Podere Terrato, Tombarelle Phase 2), to the Flavian period (Poggio dell'Amore?, Marzuolo Phase 2). None of this points to a single moment of colonial foundation. Rather, as we argued in Chapter 2, the overall chronologies of the whole region point to generally expanding rural settlement in this period, without the need to point to forced mobility (cf. Scheidel 2004).

Similarly, there's no evidence to tie our peasants to the use of that *ager publicus* that our ancient literary sources present as so hotly contested by smallholders of the late Republic. By the time settlement expands in our area, as Roselaar (2008) has documented, the *ager publicus* that could be used by any Roman citizen, the *ager occupatorius*, was almost wholly gone from central Italy. And, in any event, the small bits of *ager publicus* still in evidence in Etruria seem to have been land confiscated from individuals, not *ager occupatorius.* These were, in addition, near Capenum and Veii far to the south (Roselaar 2008).

The attempt to use sites to define ownership strategies or distinguish particular properties is rendered even more problematic by the phenomenon of distributed habitation. The example of Case Nuove is especially pertinent in this regard because superficially, it would seem a clear case where one could document ownership. Set only 500 m from the area's only villa, the late Republican pressing site seemed like a canonical case for an elite site's "satellite" as posited from field survey (Ikeguchi 2006; Haas 2012). Further excavations in the villa have revealed that the late Republican site was really a large farm at best, and the luxury villa quarters would come only at the moment or just after the Case Nuove pressing site was abandoned. Given that Santa Marta was in this moment, a farm, not really a villa, why was Case Nuove constructed? Did the impulse lie with the pooled resources of the adjacent peasant communities who seemed to have used the site, or via the directed activity of the local landowner at Santa Marta? The existence of a stand-alone press at Santa Marta, together with the fact that the site of Case Nuove served as a panopticon, visible from multiple places in the locale would point, perhaps, to the former. As we have discussed in Chapter 17 above, it was relatively easily accessible to sites located along the "ridge road" that traversed the locale from E to W. It was also served, if somewhat less well, by spurs that would have connected it to sites located in the Piani Rossi along the banks of the Orcia. On the other hand, the mere proximity of Santa Marta and the later appearance of luxury goods in the abandonment fills would suggest, rather, a model of investment by the owner and resident of the nearby farm-*cum*-villa. Different team members read the situation differently, although we ultimately all liked the notion of a landowner collaborating with local peasants to offer a shared "amenity" to be used and monitored by all—a piece of euergetism pushed from below.

Regardless, it was only through the detailed chronologies revealed through excavation of both villa and pressing site that what seemed a simple proprietary relationship became more complex. This complexity, in turn, encourages more careful consideration of the relationship between human decision making and the exigencies of the physical context in the siting of this complex. The hilltop upon which it is located is relatively flat and subject to steady winds, at least during the summer months. Its location on the "ridge road" leading to the fording point of the Ombrone in the vicinity of Paganico signals also its proximity to a focalizing point of connectivity in this landscape. Together, this combination of factors hint once again at the intimacy with which the inhabitants of this locale dwelled within it. Not only do physical activities distributed in space make ownership more complicated to detect archaeologically, but when the full archaeological tool kit is brought to bear, they can also usefully reorient us away from questions simply about who owns things, to contemplate who does things and why.

Case Nuove also provides some insights on the question of peasant demise or survival in the face of new villas in their landscapes. Again, the nuance

provided by careful excavations in the villa have shown that the site did not become a villa per se, with all the luxury apparatus that defines such sites, until the later 1st c. AD, at which time the peasant collective press was defunct. Interestingly, it does not appear that the modified villa included any agricultural quarters, all of which were abandoned or destroyed around this time (Vacarro pers. comm.). Instead the site becomes a luxury residence with an ever-expanding set of baths, leading the excavators to wonder if these might have had a public component, used by travelers. In short, what might appear to be a classic case of wealthy expansion at the expense of the peasantry turns out to be quite different. Indeed, shortly after Santa Marta turns away from agriculture, so, too, do the peasant sites with their network of distributed habitation and intensive agricultural production, seem to fall away as well. This matches what scholars have noted in other landscapes, namely that villas as agricultural units and small farms seem to share parallel histories; they expand and contract more or less on the same rhythm (Terrenato 2007; Launaro 2011:151–155). Rather than an Appian-style story of an inevitable conflict between rich and poor over land access, when viewed with some chronological precision and functional nuance, villas and farms in some places, including our locale, seem to be part of a shared system.

While mute on who owned what, the project produced more convincing data on how long they may have occupied/exploited it. The short span of occupation of these sites, an average of only 44 years across the project, does point to highly mobile property transactions—although whether those are transactions of ownership, tenancy, or some other kind of usufructuary relationship is, again, impossible to determine. One possible mechanism for interpreting these transactions would be to attribute them to practices of partible inheritance, whereby holdings are progressively split between heirs (cf. Forbes 2000a). Certainly, the Roman legal evidence suggests a tendency in favor of partible inheritance in the case of intestate succession, although it is difficult to determine the relationship between legal principles and social practices across the social spectrum (Johnston 2015; Jakab 2016). Not surprisingly, our sources are entirely silent on the subject of peasant heirship strategies, and, in any event, comparative evidence offers hints that, even in societies characterized by a legal system of partible inheritance, heirship strategies need not necessarily result in ever-increasing fragmentation of holdings and ever-decreasing shares for descendants (cf. Lamar 1994). On balance, we would incline towards interpreting this data as providing glimpses of an active, even volatile, property market. As has long been known, the notion of a Roman proprietor who can trace his ownership back centuries was largely a social construct of a society that loved the idea of continuity but was more engaged with change (Bodel 1997; Hillner 2003). Our data reveals that this would seem to apply to smallholders as well as villa-owning elites.

18.6 City, Country, and Peasants

Finley's old model of a consumer city, parasitical on its countryside, has been among the most critiqued elements of his substantivist vision (Whittaker 1990; Wilson 1990; Morley 1996:22–32; Horden and Purcell 2000:105–108). In its place, in Italy at any rate, a variety of models are emerging, replacing the unidirectional transfer of goods from country to city that he envisaged with a range of more network-based models. In an influential analysis of the relationship between Rome and its hinterland, Morley reimagined the suburbium as a kind of extension of the *urbs*, and, citing the different costs of land versus sea travel, even posited a zone of Roman urban influence up and down the whole Italian coast (Morley 1996). Work in a New Institutionalist vein has viewed cities as nodes of efficiency in an exchange network, where markets and people were concentrated, transaction costs were reduced and specialization could happen. Cities in this model act as gravitational attractors, pulling in rural peasants attracted by waged jobs, particularly those in the building industry during the building booms of the 1st c. BC to 1st c. AD, and by other specialist industries like ceramics (Erdkamp 2008, 2015).

As has been noted, while offering a somewhat more detailed analysis of the range of possible relationships between cities and countrysides, most of these models continue to be urban-centric (Van Oyen 2015b). Cities remain the principal engines governing the movement of goods, acting as agents of change on their countrysides and the urban/rural binary itself, consequently, remains intact, even though people and goods flow across it. Most significant for our

purpose, peasants remain peasants, that is, the maintenance of the urban/rural binary tends to reify rural dwellers as such; they may move around more but their locational category keeps them somehow separate. Given the continued presumption that cities are the singular socioeconomic engines in a landscape, the countryside and its denizens tend to have little agency in the articulation of the rapidly changing Roman economy.

The most significant casualty of this bias is the failure to take seriously rural demand. While brief gestures have been made to the potential importance of aggregate rural demand—after all, the demographic majority of consumers lived in the countryside—no rigorous studies have been made to estimate its size or character. This is in stark distinction to new work on Gallic countrysides, where detailed studies have mapped whole rural worlds of production of and demand for ceramics, building materials, grain, and other commodities, in which cities play an important role, but are far from the only actors (cf. Lepetz and Matterne 2003; Deru and González Villaescusa 2014). While Italian urbanism was much denser, so, too, were its countrysides; the bias is rather to be blamed on a continued assumption that cities functioned as yardsticks of Roman civilization (cf. Morley 2011), the resilience of this idea in Rome's Italian heartland, and, above all, the lack of rigorous quantitative, regionally based studies from Italian archaeology, particularly from ceramics, that would produce new models.

The data from our project described a relatively liminal rural locale that was nonetheless wholly integrated, both internally and externally. The beginnings of rural settlement are contemporaneous with similar phenomena elsewhere in this region and are no later than those immediately adjacent to Roselle. As soon as the population becomes archaeologically visible, it does so in ways that substantially reduce or in some areas of activity, even erase the urban/rural binary. They use low-denomination coinage in surprising numbers, which generally reflects the ebbs and flows of coin supply in the rest of the Italian peninsula. They use predominantly local or regionally produced ceramics, but in every site except Tombarelle, they can also be found using objects that come from outside that region, including ceramics, glass, and comestibles. Perhaps most surprising is the constant, small-scale flow of extra-regional imported wine into the region first from Campania, and then from Tunisia, Gaul, and the Aegean. While local-regional wine amphorae comprised the majority of finds and, therefore, seemingly of wine consumption, the occasional long-distance import of what must have been a locally available foodstuff is striking. The presence of these imports may be taken as evidence of long-distance connectivity, albeit at small scale. More importantly, it offers yet another instance of peasant choice.

But the urban/rural binary is diminished not simply by the presence of goods that seem to be moving between the two or small-scale signals of longer-distance exchange. As Chapter 15 makes clear, all goods, everywhere, are exchanged locally, whatever their origin. Perhaps more significant is the total absence of anything that can be defined as a particularized "peasant" material culture, diet, or architecture. Although the lack of well-published ceramics reports from central Italian cities makes it difficult to be precise, it seems as though the range of table, cooking and storage wares employed by peasants in the locale was roughly similar to those available to city-dwellers of the period. The similarities between Pievina and Roselle in the 5th c. are striking, not least because that shared table culture appears at a moment when cities and their countrysides have been argued to drift apart. The mixed cereal regime which would seem to be a canonical product of a risk-averse population appears everywhere—in cities and countrysides, in villas and small farms. Either a shared culture of risk reduction predominated everywhere, or a dietary desire for a variety of grains from fine bread wheat to barley to farro was commonly shared. Peasants in the locale consumed a goodly quantity of meat, just like their urban brethren, of the same species and following the same overall historical trends, eating more pork in the late Republic and more sheep/goat in the later empire. And whether building animal stalls or dwellings or pottery sheds, peasants here built on stone socles and covered their structures with tiled roofs. As argued in Chapter 16, the use of rammed earth or mud architecture was not exclusive to peasants or even the countryside, Roselle had wattle-and-daub buildings, the interior walls of houses at Cosa were built of pisé, as was much of the villa of Settefinestre.

This litany of "sameness," of a shared material culture, common to city and country and even, to an extent, rich and poor, is naturally also characterized

by "difference," variations that are equally important. The low-value coins at our sites support the notion that barter and coined exchange coexisted, as they certainly did, too, in cities and as they continue to do in modern economies. The scale of consumer culture, particularly and most obviously in sites on the sporadic end of the habitation spectrum, may be broadly similar in its diversity and overall character, but it is much smaller in quantity. The raw quantities of pots and glass from a shop/apartment in Roselle is much greater than those from Pievina, a testament to the fact that urban contexts were more abundantly supplied with consumer goods. But this may also be, at least in part, a product of the character of the settlements themselves. As the work in the Porta Stabia neighborhood in Pompeii has made clear, the *longue durée* of settlement in one spot has a major impact on the sheer quantity of stuff around: most of the ceramics and coins from that excavation came from fills, the palimpsest of generations of rubbish and its reuse. Rural sites, particularly our short-lived ones, have much less of this "heritage" material around and the present generation, though they appear to have shared with urban dwellers a mania for recycling, simply had less of a palimpsest at hand.

The meat diet of peasants may have been characterized by older, tougher animals than those consumed by the urban elite, and those animals are likely to have been used for labor before consumption. Certain species, particularly fowl, seem to be strong cultural markers of wealth and are largely absent on our sites, although other supposed markers like hunted animals, appear occasionally. Unfortunately, the absence of well-studied faunal and ceramic assemblages make it impossible, at this stage, to know if urban and rural cooking practices were shared or different and if these differences in meat diets yielded different culinary responses.

In short, the data from our project consistently describes a rural world that participates broadly in shared Roman material cultural practices and in which differences are more of scale than of nature, of quantitative not qualitative character. The urban/rural binary, at least from our datasets, is not to be associated with a significant material culture binary.

The high levels of peasant mobility we documented, particularly during the late Republic/early empire, likewise diminishes the urban/rural binary. Our peasants, as described in Chapter 17, probably engaged in three modalities of movement: occasional extra-locale, medium-scale periodic, and quotidian small-scale. City-country movement is contained in the first, biggest scale and the studies we carried out through GIS and walking showed that despite its boundedness by rivers, our area was entirely permeable to this kind of movement, towards Roselle and the via Aurelia as well as in the direction of Chiusi/Siena and the Via Cassia. How often they did so is less clear, for we lack any data that might substantiate hypotheses about the economic reach of the ceramics production site at Marzuolo, for example. At the very least, seasonal labor demands associated with making the pots, fueling and provisioning the site offer the possibility that individuals might also come to the locale on a regular cycle. Meanwhile, the seemingly direct ceramic connections with Roselle in the 5th c. AD could either find traveling urban merchants selling their wares locally, as we illustrated in the Pievina reconstruction in Chapter 4, or find the Pievina peasants traveling to Roselle to buy direct, an undertaking that our movement studies have shown to be a relatively straightforward exercise from a range of exit-points around the locale. The possible labor deficits presented by the synchronous needs of a ceramic factory and the planting/harvest would have also potentially brought wage laborers into the locale. In short, the mutually reinforcing factors of a highly mobile internal society, rural demand, and the enmeshed labor demands of artisanal production and agriculture would have acted as push/pull mechanisms to and from the locale, between city and country.

The notion of a broadly shared material culture and a mobile population pushing and pulling goods between city and country makes the question of rural demand even more important. If peasants consumed the same things as urban people and they both made those things and purchased them from elsewhere, the fact they did so in smaller quantities would have been potentially compensated by their far larger numbers. Thus, rural demand must have been a major component of overall consumption. The presence of Marzuolo is again revealing here. In its first phases at least, its products are found throughout the locale, both in sites we excavated and in surveyed sites. The destination of the second phase's products are unknown both because of the paucity of sites of that date in the locale, and because they could not be distinguished by thin-section analysis. Nonetheless, at

least in its early phases, the site marketed its wares locally, as well, presumably, as further afield. As this was hardly a densely populated countryside in the Augustan period, Marzuolo serves as a rather sensitive barometer to the importance of even lower-level rural demand for fine wares.

As this is the first time an Italic sigillata production site has been mapped to local consumption, we cannot say how common this phenomenon was. In other areas of the empire it was very common: the aforementioned Gallic studies mapped the production of sigillata and other wares to local, regional, and more distant sites (Delor-Ahü and Mathelart 2014; Pigière and Lepot 2014); the later sigillata industries of Spain have been thought to be the product of rural demand, allegedly for villas since the work on smaller sites is lacking (Juan Tovar 1997). Again, none of this is really surprising, but the diversity of circumstances in different parts of the empire prevents generalization. Urgently needed are more thin-section studies that extend the map of consumption beyond potters' stamps, to include and take seriously the vast body of data from field survey and rescue excavation.

While all these factors of demand, movement, and a highly mobile population tend to diminish the urban/rural binary for certain spheres of activity, the Roman city was more than simply a concentrated market space or labor market. It was above all a space of politico-religious representation, the place where the state and its relationship with the gods was made manifest in stone. Outside of Rome, the "urbanization" boom of the late Republic/early empire is initially characterized by the concentrated monumentalization of the state and its religious-civic infrastructure and only secondarily by processes of demographic attraction (Morley 2008).

It is important to highlight this fundamental character of cities because it is so totally absent in our data. Aside from the coins and the one enigmatic Etruscan tile stamp, it is hard to locate any material sign of the state in our locale. The total absence of any religious practice or ritual is even odder, notwithstanding, as we noted in Chapter 14, the total absence of any burials. We may imagine that spaces of ritual practice would tend to concentrate in central and more permanent dwellings, which were understudied by our project. As we noted, burial space may have been located in non-agricultural land, which was similarly under surveyed. Nonetheless, the contrast with a town like Pompeii is striking, where spaces from shops to latrines to small houses all contain material calls to the divine, and where the state apparatus, from political sloganeering to euergetism in its name, is ever present. The nature of the conversation with the gods, which seems to always be as public as possible in cities like Pompeii, appears muted here, while the self-presentation that was so central to Roman political life and which at Pompeii one can see being directed also at non-elites, is absent. If the material culture of Italian Roman cities is dominated by sociopolitical praxis, by the "machine of establishing and wielding power," (Morley 2008:129) then the material countryside of our locale is dominated by production, almost to the exclusion of everything else.

It is tempting to propose that the material absence of ritual practices were a result of their embeddedness in everyday life: movement along familiar paths, good and bad harvests, around an intimately known landscape, embracing elements of that landscape that are, again, archaeologically invisible. Certainly, the critical lens of Christian sources provides plenty of scope to posit sacred "pagan" topographies revolving around trees and groves, rocks, hills, and streams. Moreover, such work done on rural shrines indicates that they are not necessarily located prominently in landscapes in the manner of the larger, more monumental temples that, we must imagine, were undertaken (and funded) by a community's wealthiest members. If this is the case, then the apparent urban/rural binary that has proven so influential in previous scholarship may perhaps be better understood as a physical instantiation of two rather different practices of dwelling: on the one hand, an urban practice dominated by physical monuments of varying scales that serve as focal points for a densely concentrated, perhaps largely anonymous community; on the other, an agglomeration of lived practices, expressed most visibly in terms of production but bound together by acts of movement. Peasants' productive and ritual lives emerge here as ongoing, complementary processes transacted in a very particular place.

18.7 Wealth and Poverty

The question "how rich or poor were Roman peasants" was central to the project's design. The intention of excavating a heterogeneity of peasant

spaces, unsuccessful though that undertaking ultimately proved, was to locate a spectrum of wealth from an imputed peasant monolith and to investigate parameters such as diet, economy, and agriculture that would get at questions of well-being across that spectrum.

These questions were being debated at a macro-scale at the time the project was being developed. Stimulated by some large-scale estimates of gross domestic product (GDP) throughout history (Goldsmith 1984; Maddison 2007), a flurry of studies appeared proposing to calculate Roman GDP and per capita GDP (Temin 2006; Scheidel 2007; Lo Cascio and Malamina 2009; Scheidel and Friesen 2009; Scheidel 2009). Naturally, any answer to questions about Roman economic performance would have a major impact on how rich or poor its peasant majority was thought to be. That said, addressing this issue was not the objective of the studies in question. Rather, they were motivated by the new cliometric turn, which was accompanied by a sense of urgency to assess Roman economic performance in comparison with other economies and argue quantitatively for, or against, economic growth. While somewhat different in their methodologies, some using demand-side and others supply-side calculations, all of these approaches used some combination of a presumed number for the Roman population and estimates for wheat production, consumption, and prices. Per capita GDP calculations ranged from 166 sesterces (Temin 2006) through 250–260 sesterces (Hopkins 1995–1996; Scheidel and Friesen 2009) to 380 sesterces (Goldsmith 1984; Maddison 2007; Lo Cascio and Malanima 2014).

This is not the place for a sustained critique of these calculations, which still lack any real scholarly push-back (cf. Capogrossi Colognesi 2009). From the perspective of this project, the most significant problems were twofold. First was the basis for the demographic models themselves, characteristically first critiqued and then utilized *faute de mieux* by the participants in the debate—namely the huge uncertainty around population levels and the impact on these calculations of a peasant majority population largely engaged in self-production. The second problem we perceived was the unreliability of virtually all the other numbers, particularly wheat prices, the percentage of wheat in the diet, and the likely massive regional variation that would have characterized all these variables. The scholars engaged in this debate gestured to some of these issues but seemed convinced that even bad numbers were better than no numbers at all.

This project had hoped to contribute to these debates by providing much-needed data on agricultural productivity, wheat consumption, and other parameters pertaining to wellness. Like so many of the other issues described above, our data has added to the complexity of the problem rather than offering simple solutions. Indeed, as stressed throughout this book, the very contingency of the data, even data collected specifically to answer these questions, makes it difficult if not irresponsible to quantify it according to the categories one might want for GDP or inequality indices. Furthermore, our reservations about the methods of computing GDP for peasant societies, methods which relied preferentially on wages and food prices, made us reluctant to contribute to a calculus that we deemed to be fundamentally flawed.

The 2009 Fitoussi Report's critique on GDP calculations, which has highlighted some of these issues and, more importantly for us, recommended household-level data and more qualitative kinds of assessment, pointed to better ways of measuring non-industrial economies (Stiglitz, Sen, and Fitoussi 2009). Those recommendations grew out of new strands in development economics, pioneered in part by one of the study's authors, Amartya Sen. Rather than measure narrow aggregate production, Sen's capabilities model, modified and expanded by others, assesses not only basic human needs—health, resource access, gross wealth measurements—but also more deeply embedded social circumstances—freedom to move, to pursue opportunity, to make social and reciprocal bonds, to access markets, etc. (Sen 1985; Sen 1999; cf. Nussbaum 2000). Several ancient historians have made use of Sen's capability model, including Nussbaum's reading of Aristotle (Nussbaum 1988), a recent book assessing poverty levels of ancient Athens (Taylor 2017), and even Scheidel (2006), who initially recommended it as the best way of assessing the well-being of ancient populations, before ultimately embracing traditionally calculated GDP models as evidence of widespread Roman poverty and inequality (Scheidel and Friesen 2009; Scheidel 2017).

The value of the capabilities model for our project lies not only in its more granular and holistic analysis of well-being, but also in its suitability to our

evidence. Despite being seemingly harder to measure, parameters like mobility, access to knowledge and choice are well-attested in our datasets, whereas we have nothing to contribute to a better understanding of wheat prices. Naturally, some factors that feature prominently in Sen's sense of capabilities are impossible to excavate, access to education or recreation, for instance. In his refusal to provide a definitive list of capabilities, Sen insisted that these would be conditional on context (Sen 2004), and, indeed, our discussion below is only loosely adapted from his work, placing greater emphasis on inputs, or resources, because they tend to be what is preserved, working back from those resources to the capabilities they may have engendered, and examining some spheres of activity that would have been more central to ancient capabilities than modern.

The first is access to land. As described above, our locale was settled gradually, rather than forcibly, and given the sparseness of the population even with a possible increase, land was abundant. The Malthusian pressures assumed by the high population count are nowhere in evidence here. The dispersal of specialized sites in different ecological zones, and the rapidity with which those sites are built and abandoned likewise does not describe a world like, for instance, 13th c. England, where plots were increasingly subdivided, the same land occupied by more people even as new, more liminal territories were brought under cultivation (Dyer 1989). In other words, the volatility of occupation is not, as one would expect in a high-population situation, characterized by multiple reoccupations of the same space. The price of land, of course, is totally unknown. We can only say that there seems to have been no shortage of it.

Access to information and know-how looms large in Sen's capabilities list and historically, peasant populations' poverty is often blamed on their lack of access or unwillingness to adopt new technologies (Chayanov 1966). Two major knowledge bases have been documented in our locale, crop rotation and fine ware ceramic production. The rotation of cereals with both legumes and pasture is the most efficient use of land. As indicated, its efficiency in water-deficient regions like the Mediterranean is not related to massively increased yields, but to overall system capacity: by using fields for something each year, the yield on the land is increased, even if that yield is distributed between cereals and pasture/fodder for animals. The knowledge of ley-style rotation schemes was not limited to the elite audience of the agronomists' texts, but also extended to peasants (Kron 2008). This knowledge of what we have termed an "intensive-extensive" system would have had a fundamental impact on their ability to sustainably work the land while maintaining caloric outputs.

The production of Roman fine ware was a particularly complex process: the high firing temperatures (upwards of 900°C), the control of the oxidation and reduction process, and the flow of air had to be managed in concert. The difficulties in doing so are indicated by the large quantities of wasters the process generated, the infrequency with which large kilns like Graufesenque appear to have been fired, the effort to tabulate kiln loads, and possibly even the practice of stamping vessels with producers' names so that properly fired items in kilns with variable success rates could be credited (Murphy 2015). The S kiln in Area III at Marzuolo showed signs of modifications, protuberances to control airflow and possible bellows holes, while the presence of perforated clay muffles is probably evidence of the same efforts. In other words, Marzuolo is a prime example of the process by which fine ware firing knowledge was being generated. Who was doing this learning work is less clear: the Sextius whose misfired Experimental sigillata fills the dumps in Marzuolo's first phase cannot be clearly traced to a known potter elsewhere. It is possible he is a local. In any case, the knowledge base he and the group around him develop becomes part of the locale's technical toolkit. The later Manneius, Urbanus and Umbrichius may have begun their careers at Marzuolo or may have traveled there from elsewhere, but they undertook their work in a place that already had at least a generation's worth of experience with high-temperature firing. Thus, it is possible to suppose that the locale boasted some members with this kind of specialized knowledge (cf. Van Oyen 2016, 2020).

Mobility to access disparate resources and to take advantage of distant opportunities is amply demonstrated in our locale. The proxies provided principally by building stones, but also by ceramics indicate peasants moving around in short, medium, and longer distances. The phenomenon of distributed habitation seems to be predicated on movement to best exploit distant resources most efficiently. Mobility is also expensive, both calorically and temporally, thus

evidence for its frequency is not always a positive. It is hard to be certain that the mobility between specialized sites and the intensive agricultural practices it implies are not a sign of desperate people moving from resource to resource. That interpretation would be more likely were there signs of the scarcity of such resources, which, as noted above, does not seem to be the case. Rather, it would appear that while this locale could be described as rather marginal in its totality, at the micro-scale and in the aggregate, its dispersed, plentiful resources seem perfectly suited to the pattern of exploitation that we have sketched above.

The pressing question of whether peasants got enough to eat remains unanswered by our data. Without human skeletal remains to help evaluate nutritional intake, we have no data to access dietary quantities. Our findings do suggest they ate more meat, milk products, legumes, and protein-rich grains and less wheat than earlier studies supposed. There is reasonable, if not abundant, evidence for fruits from orchards or foraging. This would suggest that whatever the quantities, the nutritional composition of the diets of the denizens of this locale was not the monotonous, protein- and mineral-deficient diet Garnsey had originally proposed. Naturally, that mix would have varied significantly according to the individual and, more important for our current purposes, by season. The admixture of meat here is important, for meat and even more so milk as an accessible, non-seasonal caloric source buffers the dips in the agricultural cycle. A group as invested in animal husbandry as our proxy data seems to suggest this one was would have had access to such a "calorie bank." Again, the fact that older animals are more frequent suggests that the choice between eating an animal and using its labor or other assets would not have been easy: the data only suggest that the choice existed.

Finally, there is the abundant, but ambiguous evidence for access to goods. As noted above, the variety of ceramic forms, which go far beyond the basic exigencies of carrying and protecting food, the tiny, but constant presence of imported foodstuffs and consumer goods—from wine and fish sauce to glass—all describe peasant communities that had ample access to such items. Clearly the cost of a pot or an amphora of Baetican fish-sauce was not beyond their means, and the fact that they could, in theory have paid for these smaller purchases in coined money suggests that they had access to the mechanisms of exchange practiced more widely. Whether they had access to large quantities of those goods is less easy to determine: as noted above, the low quantities of these objects are what most distinguish peasant material culture from that even of the urban poor, let alone the rich.

Sen was critical generally of consumption as a barometer of well-being: resources, such as pots, are a positive sign of capabilities only if they can be shown to contribute to a person's functioning (Sen 1980). Having four different kinds of jugs or bowls, for instance, may simply indicate that Roman peasants participated in a highly saturated consumer culture (as argued above), or that they were subject, as all Romans were, to such differential and uneven flows in the availability of goods as to restrict their agency and choice (Bang 2008:131–201). At any rate, it does not necessarily follow that they experienced higher (or lower) levels of well-being as a consequence. Our own contemporary saturated consumer culture, in which people with very low capabilities also participate, is a salutary reminder of how misleading goods can be as signals of well-being. Potentially more revealing is what the variety of consumer goods says about choice: while that variety could be a product of what happened to be available, it is more likely to be the result of choice—the deliberate selection of different things to suit different purposes, by individuals able and desirous of exerting that choice. Thus, both availability and agency would seem to be at work here, and together they might gesture to a kind of capability.

Figuring prominently in Sen's and others' capabilities lists are access to justice—to legal systems, arbitration of financial disputes, and other means of guaranteeing that the law might apply to them in a positive way. The New Institutionalists, too, have made much of the advent of Roman law as providing a level playing field that greased the wheels of commerce and fostered economic growth. Work in that vein has concentrated on elites and state systems and left largely uninterrogated the not insignificant corpus of evidence for non-elites and the law. The exception is work on late antiquity, where it is clear that both state and church systems served non-elites, at least to some degree (Kelly 2004; Uhalde 2007; Dossey 2010). As we noted above, we have not one sign that our peasants had any contact with the state. This of course, does not mean they did not, only that

they left no sign of it in the material record. This is starkly different from other rural peasant populations, somewhat later under the empire, where a sizable corpus of papyri, inscriptions, and letters finds peasants accessing legal systems and arguing for their rights. While the accidents of preservation might explain this tendency in Egypt, the quite extraordinary epigraphic culture of later imperial North Africa, which contains a sizable corpus of rural dwellers' legal efforts preserved in stone, as well as ostraka containing property transactions, seems to represent a genuine regional habitus (Uhalde 2007; Dossey 2010; Conant 2013). Our peasants in southern Tuscany and indeed all of central Italy have left no such remnants. Whether this was because they took such access for granted, lacked the particular writing habitus, or actually lacked access to state systems, we have no way of judging.

In sum, then, a loosely applied capabilities approach to our data suggests that Roman peasants had some important capabilities, whereas others they either lacked or their absence or presence is impossible to determine. Naturally, this does not provide a neat answer to the question of how rich or poor were Roman peasants. In suggesting, however, that they had many of the capabilities for well-being it once again signals that perhaps we have been asking the wrong question and points the way towards a more meaningful and more answerable set of questions.

One further point might be made here: as we noted in the Introduction and Chapter 12, our project began by trying to locate peasant houses and excavated a series of small (i.e., under 0.25–0.05 ha) sites to do so. It later addressed larger sites, but in general, it expended much of its time and resources on what later emerged to be the sporadic/dispersed portion of distributed habitation. Our resulting datasets, then, reflect that bias. Left largely unexcavated were the half to one hectare sites which might have more reasonably, in retrospect, represented either central dwellings or more permanent or more wealthy dwellings. In short, the project as whole lingered on the materially poorest portions of the spectrum of habitation. Had we not, our evaluation of peasant capabilities might be somewhat greater, certainly our evaluation of their access to quantities of goods and markets. In any case, what our mistake strongly suggests is that archaeology as a discipline has probably underestimated the material footprint of peasants. As our project discovered through omission, they probably had more stuff, occupied more space, and left a greater archaeological footprint than we have assumed. Again, though, this tells us nothing about their well-being.

18.8 Peasants in Time and History

Braudel's famous tripartite conceptualization of temporality, comprising a *longue durée,* a collection of *conjonctures* in the *moyenne durée*, with the *courte durée*—a series of ephemeral événements—perched precariously on top, has long been implicated in both historical and archaeological approaches to Mediterranean history (cf. Bintliff 1991; Horden and Purcell 2005). In the present context, the analytical frame of the *Annales* problematic invites the following question: if peasants should be located *in* history rather than outside it, *how* are they in history and what temporal resolution(s) should we use in locating them? As Braudel initially conceptualized his temporal schema, it was the *longue durée* that acted imperceptibly yet irresistibly upon the social structures, institutions, and mores of the *moyenne durée*, which informed the incessant froth of the *courte durée*. In adopting the principle of the locale throughout this volume, we acknowledge the influence of the *longue durée*, the combination of topography and soil, hydrology, and climate in our region. But in scholarship since Braudel, peasants have tended, whether implicitly or explicitly, to be located at the juncture between this *longue durée* and the *moyenne durée*, the rhythms of their lives far removed from the *histoire événementielle* of named figures and historically visible events.

As this book has repeatedly reiterated, the peasants uncovered by this project are not timeless peasants. They are, rather, intensely and intensively temporal, their lifeways inflected at the daily, episodic, and seasonal levels, and linkable moreover to a set of particular historical moments. The shortest of this *courte durée* is the episodic quality of the activities that shaped our sites. Contained in the notion of a distributed habitation is a temporal spectrum, ranging from the seasonal to the occasional to a periodicity spanning multiple years. The rubbish accumulated through 10–30 seasons of olive and grape harvesting at Case Nuove Phase 1.1, or the thin lenses of dung and broken pots that developed on the floor

of the San Martino stable are the detritus of these differently scaled times. As Foxhall has noted, the événement of history is not the same as the archaeological event: the former are singular waypoints, while the latter are often aggregated little acts, a short palimpsest of the everyday (Foxhall 2000:486). The archaeology of our peasants is an archaeology of these "events" taking place at various temporal scales.

These activity bursts themselves do not seem to be sustained for much more than a few generations. As discussed in Chapter 16, the average use length of project sites is 44 years. Many sites were probably in use for less than the 30 or so years that the granularity of our ceramic data can provide. Even sites that overall suggested longer-term occupation were shown through excavation to be occupied for briefer, non-contiguous phases. Pievina, Marzuolo, and Tombarelle are all examples of the on-again, off-again habitation of what, from surface survey data, had appeared to be longer *durée* occupation. In short, the archaeology of peasant time in this locale was short-term time, quick bursts of activity in particular places, and then abandonment or hiatus.

Finally, this short-term, intensive use of specialized sites produced a very particular archaeological signature. Typically, scholars have interpreted the explosion in numbers of sites on survey maps of the period as evidence for an expansion of settlement or demographic surge. We have argued that, rather than simply indicating an increase in the number of people in this landscape, the dots represent a more intensive use of the land and a particular way of dwelling, namely, distributed habitation. That intensive use itself is discernible elsewhere in Italy, but here, as in those other regions, it has a definite, and rather limited periodicity, from sometime in the 2nd c. BC through the Flavian period (see Ch. 12). Sporadic later 2nd through 3rd c. occupation of earlier sites, but for different uses, appears at Case Nuove and Marzuolo, and after another hiatus, the very late 4th c. but more likely early 5th c. sees another moment of yet different kind of activity. What can explain these trends?

The 150 or so years which sees the establishment of the intensive system and, perhaps not coincidentally, the similarly labor and resource-intensive ceramic manufactory, is a late Republican and early imperial phenomenon. The paucity of our data do not allow us to be any more precise nor to distinguish shorter moments within this frame. Purely endogenous mechanisms for these changes could be located in the expansion or monumentalization of Roselle. We should also not lose sight of the fact that this same period witnesses the Gracchan land reforms, the Social War, the Civil War, some form of demographic expansion, the apogee of Roman urbanism, as well as much of the long period of overseas expansion—political and economic factors which may or may not have impacted locally. The end of the phenomenon at the end of the 1st c. AD seemingly corresponds to no real changes locally, although perhaps the Julio-Claudian building spurt comes to an end at Roselle and only the baths were built in the 2nd c. If this marks something of a hiatus at Roselle it would be in keeping with other central Italian cities, where major building tails off and new structures take a different character, from political monumentalization to spaces of "sociability" (Patterson 2006). Central Italian rural landscapes vary in their later 1st to 2nd c. experiences, but many show a major decline in site numbers, typically attributed to the final victory of the slave system over small proprietors, the turn to "extensive" pastoral agriculture and/or increased competition from the provinces, which shifts wine and oil production oversees.

Does this laundry list of endogenous and exogenous factors provide any causal mechanisms for the advent of an intensive distributed system in our locale? In other words, can questions about the temporal resolution of the peasantry be asked with specific reference to the particular late Republican/early imperial moment that our project has encountered? It seems certain that they can: the short duration of the system and its synchronous timing with not only the local urban and rural expansion but also broader trends, the small site expansion from surveys, the other evidence for agricultural intensification from this period, the many material and economic connections outside the locale, and the shared central Italian urban histories all point to a set of shared, complex histories in which peasants from our locale are participating.

One scholarly approach to explicating these histories deserves particular consideration here. In recent years, scholars of the political and economic history of the late Republic and early empire have devoted much attention to the phenomenon of economic "growth." Scheidel has argued that this

"growth" is mostly a by-product of demographic increase with no concomitant or no durable increase in per capita wealth (Scheidel and Friesen 2009). In his construction, the wealth from overseas expansion is imagined as simply expanding inequality. In other models, it feeds something like a "booty economy" that trickles downward, at least to a certain extent (Kay 2014). Its outlets are imagined to have been urban building projects, which themselves are thought to present both a major source of wages and the basis for the major demographic shift towards urban centers (Erdkamp 2015). New Institutionalist approaches tend also to assume that Roman rule and law brought greater economic efficiencies, including urban markets, roads, and expanded monetization, which themselves yielded industrial-scale production, agricultural innovations, cheap consumer goods, and other signals of this "growth" (Jongman 2007; Hitchner 2012; Kron 2012b; Kehoe 2015).

This focus upon institutional structures and processes—the *moyenne durée* of Braudel's schema—has the advantage of eschewing bald, *événementielle* narratives of cause-and-effect in the mold of Appian or Plutarch. But it tacitly assumes that whatever political and social upheavals there were in this period had little or no impact upon this seemingly smooth and inevitable process of economic expansion. This single-minded search for "growth" in the ancient economy, especially in the period between the 2nd c. BC and the 1st c. AD, has engendered a certain circularity in argumentation: scholars assume growth, they seek data that can be interpreted as evidence for growth, then use that data to confirm their assumptions. The question has become not "was there economic growth?" but, rather, "what kind of economic growth was there, and how much?" (Harris 2007; Scheidel 2009).

We do not wish to use the data from this project to construct an argument *against* economic growth during this period. On the contrary, the intensification of economic practices and investment in ceramic production in this locale coincide with unmistakable markers of economic connectivity. Moreover, broadly contemporaneous moments of intensification have been identified elsewhere in Italy as well. That said, there is no "smoking gun" linking these phenomena to the political and social exigencies of the period, nor can they be explained simply by evoking the inevitability of economic "growth" or the manifest advantages presented by the rule of law. Likewise, grand narratives of the triumph of the "slave villa" or of pastoralism find little purchase in analytical terms. Instead, we must imagine that, whether in economic fluorescence or in crisis, our peasants were involved in both shaping and responding to their circumstances.

Put another way, the project's indicators of economic prosperity cannot simply be explained as epiphenomena of inevitable processes that occur in the *moyenne durée*. Rather, at the level of granularity provided by our data, the impression of a long-term, smooth progression, of economic "growth," whether gross or per capita, resolves into a series of short-lived episodes, themselves the products of decisions and practices occurring at the micro-regional, regional, and super-regional scales, and over seasonal, annual, and multi-year periodicities.

Decisions to plant cereals and legumes in particular ratios and to devote specific areas to sheep-grazing were locally made responses to geomorphology and soils, the seasonal and inter-annual exigencies of temperature, rainfall, and internal demand. But, as a result of the close connections between this region and its surrounds, these decisions can also be placed within broader socioeconomic and political contexts. For example, the intensification of agricultural practices that is so striking in this period seems linkable both to the increased demands for labor represented by the manufactory at Marzuolo and to the hints of increased wealth and greater political connectivity offered by the frenzy of building activity at Roselle. At a coarser level of granularity still, it occurred contemporaneously with the military, economic, and demographic pressures attending the Sullan/Marian conflict, which appear to have left marks in other areas of Etruria (cf. Harris 1971). Was the location of a site for processing grain and other agrarian produce at Case Nuove, along one of the principle routeways in the locale, also a response to an uptick in regional demand as farmers elsewhere in central Italy were drawn into the civil conflicts of the period, thereby leaving their crops unsown and/or unharvested? We have no evidence to support such a hypothesis. But, as we have discussed in greater detail above (Ch. 12), it is clear that our peasants—here, as elsewhere in Italy, and at this particular late Republican moment—were consciously adopting new strategies for using and managing the land. Those strategies rested

upon a high degree of mobility within the locale, and that intense internal mobility appears to have been accompanied by a high degree of connectivity with other parts of Italy and the Mediterranean.

Changes in the origins and quantities of "imported" ceramics in this locale reflect another element in those interactions, namely changes in the articulation and weight of longer-distance economic networks between the 1st c. BC and the 2nd c. AD which produced a move from local/regional to extra-regional wares. The distribution of both fine wares and, perhaps, smaller amphorae produced at Marzuolo in its earlier phases followed by the possible reorientation of the site towards an external market in its later 1st c. AD phase, instantiate another such change. Together, these factors offer hints of a series of multiscalar pushes and pulls between supply and demand, with ripple effects that simultaneously impacted upon this region and moved outwards from it. Did increased income from local production of ceramics facilitate acquisition of wares from further afield? Our data does reveal that the countryside was a major site of artisanal production and consumer demand for all kinds of goods from ceramics and glass to leather and textiles. The possibility that these forces of supply and demand might bypass cities entirely necessitates further reconsideration of the weight placed upon the role of urban agglomerations in economic models of the period—whether that be as parasites, producers, or even switch-points in networks. Here, then, we encounter the *deus ex machina* explanations of the New Institutional Economics but grounded more explicitly in the particularities of this locale (cf. Erdkamp 2015).

The 5th c. AD moment is somewhat better studied, with careful, local and regional studies on ceramics and settlement, although again their relationship with broader political and economic shifts remains to be considered (Wickham 2005; Brogiolo and Chavarría 2005; Christie 2006; Cirelli, Diosono and Patterson 2015). Our locale's "revival" of a small number of sites is again a shared one, primarily with the adjacent regions of Montalcino and Monte Amiata but also in many, but not all, landscapes in central Italy, including the Roman suburbium (Botarelli 2004:197–202; Patterson, Di Giuseppe, and Witcher 2004; Felici 2004:222–225; Vaccaro 2009). However, our data might suggest that what appears to be a "return" of settlement actually represents a somewhat different way of "dwelling" in the landscape. Previously occupied sites like Pievina or Case Nuove may be "reoccupied" but the nature of that occupation is quite different. As the correspondence, although not the nMDS (non-metric multidimensional scaling), analyses, show (Ch. 12), the late Republican distributed system of specialized sites does not reappear in this moment. Instead, later 4th and 5th c. sites might contain all activities in a single site. The proxy data for mobility in the form of building stones likewise describes a diminution of that constant movement that yielded such a diversity of stones, replaced by the use, often, of a single source. Mobility, therefore, seems to become if not limited, then highly targeted, and most of the indices for intensive agriculture disappear. Crop rotation continues, as the data from Case Nuove indicates. Beneath the homogeneity of survey data may lie a different world of lived experience.

The relationship between our 5th c. peasants and the broader climatic circumstances of the later empire are similarly complex. New work has drawn on a diverse and often conflicting dataset on the changes to Mediterranean environments between the 3rd c. BC and the 6th c. AD, emphasizing a "Roman warm period" that dominated much of the Republic and early empire, and a cooling period (punctuated by a dramatic Justinianic dust veil), stretching from the the 3rd to 7th centuries and beyond. A willingness to accept the data for these trends as unambiguous, despite the equally strong evidence for local variation and exception, and a tendency to ascribe to them a unidirectional historical causality, has marked a popular strand of Roman and later Roman history (McCormick et al. 2012; McCormick 2013; Harper 2017). None of the data from this project bears out the notion that peasants in our region were impacted in any simple way by these climatic trends: the major shift in peasant numbers and lifeways occurs at the apogee of the "Roman warm period" in the later 1st to early 2nd c. AD—a moment which an environmentally determined history would have them at their most productive, visible, and stable. Similarly, the activities and temporalities of later Roman peasants in the locale show both continuities and changes from earlier periods, but none of these can be attributed to climatic cooling in any unambiguous way. Living close to the land, peasants would have experienced climate in visceral ways, but they would have done so as part of the interannual variation, which was

always pronounced in central Italian regions, and in the context of their own insistent impact on the environment. This impact is everywhere more apparent in the form of drainage, plowing, settlement, and vegetation rather than changes solely attributable to climate (cf. Haldon et al. 2018; Squatriti 2018; Bosi 2019; Sessa 2019; Grey 2019).

Viewed in these terms, the narrative that emerges from our data is one of continuous discontinuity. At the micro-level, both temporally and geographically, we have described short, intense bursts of activity, as individual sites were activated and exploited for a generation or so before falling into disuse. This constant froth of activity will have impacted in myriad ways upon patterns of movement within and across this region, which, in turn, will have inflected the connectivities that leave echoes in the distribution of the various ceramic types. The availability of those ceramics is likely to have been a product of the irregular, yet continued distribution networks which, operated simultaneously at the supra-regional and local scales. The political and economic forces that combined to produce a particular set of market circumstances and opportunities for public building and display in Roselle in the period will have had ripple-on effects for the resources available to our peasants and the demands or opportunities for disposal of surpluses, as will those in Chiusi, Siena, or elsewhere. In each case, a collection of local phenomena combined with more distant forces to produce a particular set of circumstances. Our peasants were subject to those circumstances, but they were also agents generating them.

In generating their own circumstances, our peasants were bringing to bear a collection of economic strategies in a specific place at a particular time. As the contrasts between the late Republican and late imperial data from our project, and between our findings and those from Britain and France reveals, changes to any of those three elements produces markedly different material expressions. Consequently, it is our strong conviction that our peasants can and should be compared with other peasants, both from elsewhere in the Roman world and from other times and places (cf. Dommelen and Terrenato 2007). But the appropriate analytical lens for that comparison is not at the micro-level of individual practices: in and of themselves, those practices tell us little, and comparison of this sort merely perpetuates the impression of timelessness that we have critiqued throughout this volume. Instead, we must concentrate upon the package of practices, contexts, and pressures, situated both in time and in space. At this level of analysis, the lifeways of peasants emerge not as enduring structures of the *moyenne durée*, but, rather, as an ever-changing ferment of *événements*, responding to and constructing those structures. This is an *histoire événementielle* of a rather different type to that envisaged by Braudel, for not only does it represent the sum of actions carried out by the bulk of the population, those actions are also, in the aggregate, historically meaningful.

18.9 Extendability

This project presents the results of 8 site excavations. This almost doubles the number of peasant sites excavated in central Italy, but given the total probable dataset, the results have not the remotest statistical significance. Throughout this volume, we have raised the question of whether our results might be generalizable or extendable past their individually bounded circumstances. We have tried to signal those places where we believe they are, and the data supporting that interpretation, and those places they are not. Both lists are worth repeating here.

1. "Distributed habitation": The phenomenon of many, small, specialized sites and the intensive agricultural practice they represent. As no project has excavated such small sites, we have no direct confirmation for our model outside this region. As noted, the appearance of surface scatters in so many central Italian landscapes that seem to echo those we excavated is the best evidence that some, if not many, such landscapes were inhabited in this way. It seems likely that in some of these landscapes, it is the spaces of production, not habitation, that predominate.

   Large-scale excavation data from southern France, particularly in the Narbonnaise, indicates a similar pattern of specialized sites and predominance of production spaces. Other data from northern Gaul and Britain suggest the distributed mode of habitation was not used in these regions.

2. Intensification: The data for this is tied to distributed habitation and seems to be its *raison d'être*. While there is not comparable excavated data for the former, intensification has been hypothesized from survey data in the Pontine region and from sporadic finds of terraces and irrigation works in Lazio. Other regions of the empire show similar moments. The best data comes currently from large-scale excavations in Gaul, but the chronology and form is different.

3. A shared peasant material culture: "peasant" material culture is Roman material culture. No major differences in the character of consumer goods, dietary meat, cereals, or architecture separates our data from rural villas, or the little data that exists for the urban poor. However, some significant differences exist between the quantity of consumer goods—particularly with urban contexts—and more subtle distinctions of quality—older tougher meats, no imported fruits, vegetables, or spices. No detailed studies exist for central Italian peasants with which to compare these hypotheses. Work on Gaul has tended to find similar patterns, although the focus of such work has been somewhat different. A current model for Britain proposes the opposite, namely an exploited and cut-off countryside where the benefits of Roman rule were confined to cities while the countryside, particularly peasants, were left in material poverty with lower standards of living (Mattingly 2006; Pitts 2015).

Scholars interested in the questions addressed in this volume have cleaved to the position that the manifest lacunae in our knowledge mandate that we construct comprehensive models to smooth out the infelicities in what remains and to render them comprehensible and generalizable. In short, the scholarly task is to get beyond the noise to produce more useful, model-yielding data. We would make a slightly different argument. The above list, its proposed points of comparison and contrast, are intended to suggest that the noise *is* the data. The variability in the way that peasants throughout the Roman territories inhabited their landscapes, exploited their agricultural and industrial potential, and interacted with cities lies at the heart of the history of the Roman peasant majority.

We would suggest that the task in studying what we have termed "Roman peasants" is not to render the complex, contradictory evidences of the past straightforward and simple. Rather, it is to acknowledge the complexity and to celebrate the contradiction in an analytically comprehensive way. By adopting the model of distributed habitation, situating that model within a combined activity and physical space that we have labeled the locale, and giving that model historical specificity, we have sought to do just this. If the findings of the Roman Peasant Project are extendable, we would hope that it is the approach—the methodological and theoretical underpinnings—as much as the particularities of the data itself that provides food for thought.

18.10 Future

We do not wish to suggest that there are not profound limitations and challenges to this approach, indeed, we have sought to identify and acknowledge those limitations throughout this volume. In essence, the idea of the Roman Peasant Project was that it be a first salvo that could be returned through further, better, more complex projects testing the conclusions and correcting the errors of this one. One of the reasons we have tried to extend our ideas beyond the limits of the purely archaeological-empirical is to incite such further work: lists provoke no responses. And, as the photos with which we began this volume remind us, approaching ancient peasants is ever a balancing act between our own presentist preconceptions and the lived experience of the past. Such balancing is precarious and liable to correction. In that spirit, we conclude by reflecting on the direction such future work might take.

Most urgent is to test and refine the model of distributed habitation. More excavation across a range of site types is necessary to prove our hypotheses. Excavation of larger sites, in the 1 ha range, is a major desideratum, sites that may represent the so-called "central habitation" which is critical to the model and was under documented in our project. Extending the project model or some version of it, outside this region, in more central, villa-saturated landscapes, is also crucial, ideally undertaken as part of an artifact-density-driven surface survey so that

the relationships between large and small-scale agriculture and intensification can be plumbed more rigorously.

Large-scale geophysics, of the type that has begun in Tuscany, may aid in this endeavor, particularly by revealing the all-critical field systems that our project failed to detect (cf. Campana, Francovich, and Felici 2005; Campana 2017). On the other hand, our project, like other so-called "total" projects, has shown that geophysics, like surface survey, should always be accompanied by excavation, both to get at the precociousness of temporal scales that are obscured through remote sensing and to reveal lives, not just landscapes. We failed to carry out a series of analyses which, in retrospect, would have made those lives more vivid. Extensive phosphate analysis combined with geophysics would have illuminated agricultural practice in broader space; isotope analysis of faunal and botanical materials might have revealed movement of plants and animals, not just ceramics and building stone.

One of the biggest limitations for this project was the absence of comparative data or similar studies that might have guided our own. The easiest way to generate such data for Italy, of course, is to enact and enforce the kind of rescue excavation laws promulgated in Britain and France, laws which have made partners of construction and academic research and which have produced such massive, publicly accessible datasets on rural landscapes and, by extension, peasant lives. In these countries, no one need ever carry out the Roman Peasant Project, as the work has already been done by contract archaeology; one need only gather the data, as is now being done comprehensively (e.g., Smith et al. 2016).

In its conception, this project was speculative, suspended between the complementary objectives of its directors. In its execution, it was characterized by at least as many mistakes as triumphs, by roads-not-taken as much as by new paths forged. It is our hope that future scholarship will uncover still more errors and infelicities in our findings than we have identified ourselves, and that more projects like this will confirm our impression that there is no "timeless peasant" and still less a "typical" Roman peasant.

19

Appendices

Appendix 19.1: Community Projects with the *commune* of Cinigiano (MG, MC, KB)

From 2009 through 2014, the project carried out a series of collaborations with the commune of Cinigiano, leveraging the excavations and its staff for the benefit the local community. This took three forms: information exchange via public workshops and site visits; site tours for women and children at risk, and a series of programs in the local elementary school.

As noted in Chapter 2, part of the project methodology, as well as the commitment it made to the farmers on whose land we excavated, was to backfill all sites immediately upon the completion of the 5-week excavation season. The creation of permanent, musealized "sites," something the town administration had suggested a desirable project, was thus problematic for our notion of a sustainable, agriculture-friendly archaeology. The township had also originally asked us to mount our results as a small exhibition, either permanent or traveling in nature. This, too, we resisted. The mushrooming of both musealized archaeological sites and tiny archaeological museums has often proven unsustainable, particularly in rural Italy (Gould 2018:4). While money can usually be found for their creation and design, the shrinking budgets of most municipalities make long-term maintenance challenging, while most town's limited tourist and information infrastructures leave visitor numbers tiny (Gould 2018:121–136 on the Val di Cornia). Thus, our first efforts to respond to local interests ran up against our own sense of the unsustainability of those ideas.

Instead, building on other suggestions from the mayor and her office, we proposed a series of educational initiatives that would leave no physical footprint, but nonetheless convey our discoveries and leverage the expertise of the various team members to different demographics—particularly older farming families and young children.

Despite having eschewed ethnography as comparative data, we nonetheless were eager to share our results with members of the farming community. Living close to the land, their experience of the minutiae of daily life, while not resembling ancient Roman peasants, would, we felt, be an important corrective to the high-altitude approach of much of our scholarly interlocutors. We scheduled a series of three information sharing evenings, inviting particularly the farmers on whose land we excavated as well as any other interested parties, and held the events in the local bar to make them informal and open. We received a number of useful observations about plowing and soil weight in the locale, drainage, and were reminded usefully of how critical soil workability is

to agricultural decision making, even for farmers using mechanized systems.

The town's mayor was also keen to combat the youth-drain which negatively impacts small rural towns. The town's young leave in large numbers for cities, pushing rural villages into unsustainable demographic crisis. Interesting young people in their local culture and in archaeology as a discipline would, she felt, highlight the benefits of the rural world. Mariaelena Ghisleni and Marianna Cirillo thus began a series of units in the local elementary school, aimed at a self-selected group of third through fifth graders (the equivalent of 2nd, 3rd, and 4th grades in the US).

These units were developed in consultation with each grade's teachers so that the material would be both age appropriate and fit into the state-mandated curriculum. Units were developed for a group of third, fourth, and fifth graders for six, two-hour units in the spring term, and were focused on the following goals:

1. Explaining what archaeology is and what an archaeologist does.

2. Describing briefly the Roman Peasant Project and its results in the context of Roman-period Cinigiano.

3. Describing the process of archaeology from how a site is discovered to how it is excavated.

4. Explaining the principles of stratigraphy.

5. A workshop on archaeological ceramics.

These paedagical goals were delivered in two-hour sessions through a combination of lecture and hands-on activities. The later included the creation of a large timeline to illustrate the concept of different bands of archaeological time (Color Fig. A.1); a sandbox with "finds" to illustrate the principles of stratigraphy, and a ceramic-making workshop to illustrate the basic principles of clay working and ceramic typology (Color Fig. A.2).

Changes in the Cinigiano school schedule and budget made it harder to continue the project in later years, and the initiative was abandoned. However, Mariaelena Ghisleni later exported the principles of these pedagogical units to schools near Modena, where she has taught them for a number of years.

One of the students who was positively impacted by these lessons told her mother about the project. A Swiss-born villager, the mother had been volunteering with the battered women's shelter located in a nearby town. Seeing the enthusiasm her own daughter had for archaeology, she helped us establish a yearly site-visit for the children of battered women, where Marianna Cirillo gave them a site tour and some small hands-on exercises. As all of these children are effectively in hiding from abusive fathers, we cannot reproduce any images of these visits here. The visits seemed transformative for these children, not least for the possibility of actually engaging, even in a tiny way, in the process of research and touching some piece of the past.

As Italy struggles to manage its cultural burden through governmental means and as archaeologists find themselves increasing that burden by producing new sites and new museums, we hope that in a small way, these project suggest other ways that archaeological knowledge might contribute to local communities.

Appendix 19.2: Ceramics Classes, All Sites (EV)

Table 19.2a Ceramics Classes, All Sites

Table 19.2b Ceramics Form/Function, All Sites

Table 19.2a Ceramics classes, all sites (EV).

Marzuolo Phase 1 (730 diagnostics/ 421 MN)	Marzuolo Phase 2 (3014 diagnostics/ 334 MNI)	Marzuolo Phase 3 (533 diagnostics/ 251 MNI)	Tombarelle Phase 1 (257 diagnostics/ 109 MNI)	Tombarelle Phase 2 (34 diagnostics/ 29 MNI)	Tombarelle Phase 3 (367 diagnostics/ 190 MNI)
19 or 4.51%	0 or 0%	4 or 1.59% (residual)	18 or 16.51%	0 or 0%	0 or 0%
54 or 12.82%	264 or 79.04%	14 or 5.57% (residual)	6 or 5.5%	6 or 20.68%	0 or 0%
23 or 5.46%	4 or 1.19%	7 or 2.78%	3 or 2.75%	1 or 3.44%	0 or 0%
93 or 22.09%	0 or 0%	5 or 1.99% (residual)	3 or 2.75%	0 or 0%	0 or 0%
0 or 0%	0 or 0%	13 or 5.17%	0 or 0%	0 or 0%	0 or 0%
10 or 2.37%	3 or 0.89%	13 or 5.17%	0 or 0%	0 or 0%	121 or 63.68%
0 or 0%	0 or 0%	0 or 0%	0 or 0%	0 or 0%	2 or 1.05%
0 or 0%	0 or 0%	6 or 2.39%	0 or 0%	0 or 0%	0 or 0%
90 or 21.37%	13 or 3.89%	58 or 23.1%	45 or 41.28%	11 or 37.93%	19 or 10%
79 or 18.76%	9 or 2.69%	49 or 19.52%	23 or 21.1%	5 or 17.24%	41 or 21.57%
0 or 0%	0 or 0%	9 or 3.58%	0 or 0%	0 or 0%	0 or 0%
22 or 5.22%	40 or 11.97%	42 or 16.73%	6 or 5.5%	2 or 6.89%	2 or 1.05%
5 or 1.18%	0 or 0%	2 or 0.79%	0 or 0%	0 or 0%	0 or 0%
8 or 1.9%	0 or 0%	12 or 4.78%	4 or 3.66%	3 or 10.34%	0 or 0%
2 or 0.47%	0 or 0%	3 or 1.19%	0 or 0%	0 or 0%	1 or 0.52%
12 or 2.85%	1 or 0.29%	13 or 5.17%	1 or 0.91%	1 or 3.44%	0 or 0%
0 or 0%	0 or 0%	0 or 0%	0 or 0%	0 or 0%	0 or 0%
0 or 0%	0 or 0%	0 or 0%	0 or 0%	0 or 0%	0 or 0%
4 or 0.95%	0 or 0%	0 or 0%	0 or 0%	0 or 0%	2 or 1.05%
0 or 0%	0 or 0%	1 or 0.39%	0 or 0%	0 or 0%	0 or 0%
0 or 0%	0 or 0%	0 or 0%	0 or 0%	0 or 0%	2 or 1.05%

Table 19.2b Ceramics Form/Function, All Sites

FORMS	Pievina Phase 1 (159 diag./ 30 MNI)	Pievina Phase 2.2 (310 diag./ 232 MNI)	Case Nuove Phase 1 (117 diag./ 45 MNI)	Case Nuove Phase 1.2 (174 diag./ 50 MNI)	Case Nuove Phase 1.3 (92 diag./ 27 MNI)	Case Nuove Phase 2 (190 diag./ 72 MNI)	San Martino (85 diag./ 47 MNI)
KITCHEN (includes KW and VRI)	15 or 50%	60 or 25.86%	20 or 44.44%	13 or 26%	6 or 22%	27 or 37.5%	18 or 38%
Generic closed forms for kitchen	0	2 or 0.86%	0	0	0	0	0
Cooking pots	7 or 23.33%	31 or 13.36%	8 or 17.77%	7 or 14%	2 or 7.4%	18 or 25%	12 or 25.53%
Cooking jugs	1 or 3.33%	1 or 0.43%	2 or 4.44%	0	0	0	0
Generic open forms for kitchen	0	0	0	0	0	0	0
Casseroles	0	3 or 1.29%	0	2 or 4%	1 or 3.7%	1 or 1.38%	0
Cooking bowls	0	1 or 0.43%	1 or 2.22%	0	0	0	1 or 2.12%
Frying pans/*tegami*	2 or 6.66%	1 or 0.43%	3 or 6.66%	1 or 2%	1 or 3.7%	1 or 1.38%	0
Clibani	0	0	0	0	0	0	0
Bread-baking pans/*testi*	0	6 or 2.5%	0	0	0	2 or 2.77%	0
Cooking lids	5 or 16.66%	15 or 6.46%	4 or 8.88%	3 or 6%	2 or 7.4%	5 or 6.94%	5 or 10.63%
DINING/STORING (includes CW, FW and CCW)	13 or 43.33%	136 or 58.61%	21 or 46.66%	29 or 58%	11 or 40.7%	44 or 61.1%	21 or 44.68%
Generic closed forms for table and storage	0	21 or 9.05%	0	0	0	0	0
Jugs	3 or 10%	20 or 8.62%	2 or 4.44%	3 or 6%	2 or 7.4%	0	1 or 2.12%
Jars	0	2 or 0.86%	0	0	0	2 or 2.77%	1 or 2.12%
Jugs/jars	0	0	0	0	0	5 or 6.94%	0
Beakers	0	0	3 or 6.66%	2 or 4%	0	0	1 or 2.12%
Small table pot	0	1 or 0.43%	1 or 2.22%	0	0	1 or 1.38%	3 or 6.38%
Bottles	1 or 3.33%	0	0	0	0	0	1 or 2.12%
Flasks	1 or 3.33%	0	0	1 or 2%	0	1 or 1.38%	0
Chalice	0	0	0	1 or 2%	0	0	1 or 2.12%
Flanged-Bowls	0	6 or 2.5%	0	0	0	0	0
Generic opens forms for table	0	0	2 or 4.44%	1 or 2%	0	0	1 or 2.12%
Bowls	5 or 16.66%%	14 or 6.03%	7 or 15.55%	4 or 8%	2 or 7.4%	11 or 15.27%	1 or 2.12%
Cups	3 or 10%	0	0	6 or 12%	0	0	3 or 6.38%
Dishes	0	27 or 11.63%	4 or 8.88%	6 or 12%	1 or 3.7%	17 or 23.61%	6 or 12.76%
Bowls/Dishes	0	21 or 9.05%	0	2 or 4%	3 or 11.11%	0	1 or 2.12%
Basins	0	18 or 7.75%	0	0	2 or 7.4%	5 or 6.94%	1 or 2.12%
Lids	0	5 or 2.15%	0	3 or 6%	1 or 3.7%	0	0
Small vessels for sauces or parfumes(?)	0	0	0	0	0	2 or 2.77%	0
Uncertain (food processing?)	0	0	0	0	0	0	0

	Poggio dell'Amore (41 diag./ 21 MNI)	Colle Massari Romano (13 diag./ 11 MNI)	Podere Terrato (102 diag./ 62 MNI)	Marzuolo Phase 1 (730 diag./ 421 MNI)	Marzuolo Phase 2 (3014 diag./ 334 MNI)	Marzuolo Phase 3 (533 diag./ 251 MNI)	Tombarelle Phase 1 (257 diag./ 109 MNI)	Tombarelle Phase 2 (34 diag./ 29 MNI)	Tombarelle Phase 3 (367 diag./ 190 MNI)
	6 or 28.56%	5 or 45.45%	11 or 17.74%	87 or 20.66%	9 or 2.69%	69 or 27.49%	27 or 24.77%	8 or 27.5%	41 or 21.54%
	0	0	0	0	0	0	0	0	0
	2 or 9.52%	2 or 18.18%	4 or 6.45%	53 or 12.58%	5 or 1.49%	22 or 8.76%	9 or 8.25%	3 or 10.34%	22 or 11.57%
	0	0	1 or 1.61%	0	0	1 or 0.39%	0	0	0
	0	0	0	0	0	0	0	0	0
	2 or 9.52%	0	2 or 3.22%	3 or 0.71%	1 or 0.29%	16 or 6.37%	0	1 or 3.44%	9 or 4.73%
	1 or 4.76%	1 or 9.09%	0	2 or 0.47%	0	2 or 0.79%	0	1 or 3.44%	1 or 0.52%
	0	1 or 9.09%	3 or 4.83%	11 or 2.61%	3 or 0.89%	15 or 5.97%	5 or 4.58%	3 or 10.34%	0
	0	0	0	2 or 0.47%	0	0	6 or 5.5%	0	0
	0	0	0	0	0	0	0	0	3 or 1.57%
	1 or 4.76%	1 or 9.09%	1 or 1.61%	16 or 3.8%	0	13 or 5.17%	7 or 6.42%	0	6 or 3.15%
	13 or 61.88%	3 or 27.27%	46 or 74.19	285 or 67.69%	284 or 85.02 %	118 or 47.01%	74 or 67.88%	18 or 62.06%	144 or 75.78%
	0	0	7 or 11.29%	22 or 5.22%	0	9 or 3.58%	0	0	6 or 3.15%
	3 or 14.28%	1 or 9.09%	10 or 16.12%	26 or 6.17%	7 or 2.09%	24 or 9.56%	23 or 21.1%	7 or 24.13%	16 or 8.42%
	1 or 4.76%	1 or 9.09%	1 or 1.61%	7 or 1.66%	3 or 0.89%	6 or 2.39%	5 or 4.58%	1 or 3.44%	0
	0	0	0	9 or 2.13%	2 or 0.59%	0	5 or 4.58%	0	15 or 7.89%
	0	0	3 or 4.83%	18 or 4.27%	2 or 0.59%	5 or 1.99%	3 or 2.75%	1 or 3.44%	1 or 0.52%
	0	0	2 or 3.22%	9 or 2.13%	6 or 1.79%	6 or 2.39%	0	0	0
	0	0	0	12 or 2.85%	0	5 or 1.99%	3 or 2.75%	0	6 or 3.15%
	0	0	0	0	0	0	0	0	0
	0	0	0	0	11 or 3.29%	2 or 0.79%	0	0	0
	0	0	0	0	0	0	2 or 1.83%	0	0
	1 or 4.76%	0	1 or 1.61%	8 or 1.9%	1 or 0.29%	3 or 1.19%	0	0	0
	0	0	0	53 or 12.58%	0	19 or 7.56%	14 or 12.84%	1 or 3.44%	18 or 9.47%
	5 or 23.8%	1 or 9.09%	9 or 14.51%	37 or 8.78%	114 or 34.13%	8 or 3.18%	2 or 1.83%	2 or 6.89%	0
	3 or 14.28%	0	12 or 19.35%	76 or 18.05%	131 or 39.22%	21 or 8.36%	16 or 14.67%	5 or 17.24%	42 or 22.10%
	0	0	0	0	0	1 or 0.39%	0	0	0
	0	0	1 or 1.61%	5 or 1.18%	0	4 or 1.59%	0	0	37 or 19.47%
	0	0	0	3 or 0.71%	7 or 2.09%	5 or 1.99%	0	0	2 or 1.05%
	0	0	0	0	0	0	1 or 0.91%	1 or 3.44%	0
	0	0	0	0	0	0	0	0	1 or 0.52%

Table 19.2b cont'd Ceramics Form/Function, All Sites

FORMS	Pievina Phase 1 (159 diag./ 30 MNI)	Pievina Phase 2.2 (310 diag./ 232 MNI)	Case Nuove Phase 1 (117 diag./ 45 MNI)	Case Nuove Phase 1.2 (174 diag./ 50 MNI)	Case Nuove Phase 1.3 (92 diag./ 27 MNI)	Case Nuove Phase 2 (190 diag./ 72 MNI)	San Martino (85 diag./ 47 MNI)
Mortaria	0	0	2 or 4.44%	0	0	0	0
TRANSPORT and STORAGE	2 or 6.66%	26 or 11.2%	4 or 8.51%	5 or 10%	9 or 33.32%	1 or 1.38%	6 or 12.76%
Amphora stoppers	0	0	0	1 or 2%	0	0	0
Amphorae	2 or 6.66%	24 or 10.34%	4 or 8.88%	4 or 8%	5 or 18.51%	1 or 1.38%	4 or 8.51%
Dolia	0	1 or 0.43%	0	0	4 or 14.81%	0	1 or 2.12%
Table amph/jar	0	1 or 0.43%	2 or 4.44%	0	0	0	1 or 2.12%
LIGHTING	0	2 of 0.86%	0	2 or 4%	1 or 3.7%	0	0
Lamps	0	2 or 0.86%	0	2 or 4%	1 or 3.7%	0	0
OTHER "FUNCTIONAL" CERAMICS	0	0	0	1 or 2%	0	0	1 or 2.12%
Loomweights	0	0	0	0	0	0	1 or 2.12%
Drains	0	0	0	0	0	0	0
Unguentaria	0	0	0	1 or 2%	0	0	1 or 2.12%
Kiln spacers	0	0	0	0	0	0	0
Moulds	0	0	0	0	0	0	0
Tubuli	0	0	0	0	0	0	0
RESIDUALS	0	9 or 3.87%	0	0	0	0	0
UNCERTAIN	0	0	0	0	0	0	0

	Poggio dell'Amore (41 diag./ 21 MNI)	Colle Massari Romano (13 diag./ 11 MNI)	Podere Terrato (102 diag./ 62 MNI)	Marzuolo Phase 1 (730 diag./ 421 MNI)	Marzuolo Phase 2 (3014 diag./ 334 MNI)	Marzuolo Phase 3 (533 diag./ 251 MNI)	Tombarelle Phase 1 (257 diag./ 109 MNI)	Tombarelle Phase 2 (34 diag./ 29 MNI)	Tombarelle Phase 3 (367 diag./ 190 MNI)
	0	0	0	0	0	0	0	0	0
	2 or 9.52%	2 or 18.18%	5 or 8.06%	28 or 6.65%	40 or 11.97%	50 or 19.92%	6 or 5.5%	2 or 6.89%	3 or 1.57%
	0	0	0	0	0	5 or 1.99%	0	0	0
	2 or 9.52%	2 or 18.18%	5 or 8.06%	21 or 4.98%	40 or 11.97%	42 or 16.73%	6 or 5,5%	2 or 6.89%	2 or 1.05%
	0	0	0	2 or 0.47%	0	2 or 0.79%	0	0	1 or 0.52%
	0	0	0	5 or 1.18%	0	1 or 0.39%	0	0	0
	0	0	0	12 or 2.85%	1 or 0.29%	13 or 5.17%	1 or 0.91%	1 or 3.44%	0
	0	0	0	12 or 2.85%	1 or 0.29%	13 or 5.17%	1 or 0,91%	1 or 3.44%	0
	0	1 or 9.09%	0	9 or 2.13%	0	1 or 0.39%	1 or 0.91%	0	2 or 1.05%
	0	1 or 9.09%	0	0	0	0	0	0	0
	0	0	0	0	0	0	1 or 0,91%	0	0
	0	0	0	2 or 0.47%	0	1 or 0.39%	0	0	0
	0	0	0	2 or 0.47%	0	0	0	0	2 or 1.05%
	0	0	0	1 or 0.23%	0	0	0	0	0
	0	0	0	3 or 0.71%	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	1 or 0.23%	0	0	0	0	0

Appendix 19.3: Faunal Materials (MM)

Table 19.3a NISP Relative Frequencies for Consumed Taxa, All Sites

Table 19.3b Minimum Number of Individuals (=MNI) by Taxon, Age Category, and Site, All Sites

Table 19.3c Cattle – Relative Frequency by Skeletal Part Category, Calculated on the Basis of NISP and MNE, All Sites

Table 19.3d Sheep/Goat – Relative Frequency by Skeletal Part Category, Calculated on the Basis of NISP and MNE, All Sites

Table 19.3e Pig – Relative Frequency by Skeletal Part Category, Calculated on the Basis of NISP and MNE, All Sites

Table 19.3f Relative Frequency of UNID Counts by Site, All Sites

Table 19.3a NISP Relative Frequencies for Consumed Taxa, All Sites (MM)

Site	Date century	NISP total[a]	% Cattle	% Sheep/Goat	% Pig	NISP other[b]
Case Nuove Phase 1.1	1 BC	14	50	21.4	28.6	1 red deer, 1 roe deer, 14 domestic fowl
Marzuolo Phase 1	1 BC	310	32.6	19	48.4	12 domestic fowl, 4 red deer, 3 wild boar, 1 other avian
Tombarelle Phase 1	1 BC	36	58.3	19.4	22.2	17 red deer, 4 wild boar
Pievina Phase 1	1 BC–1 AD	23	13	26.9	60.9	1 red deer, 1 hare, 1 domestic fowl
Case Nuove Phase 1.2	1 BC–1 AD	73	—	34.2	65.8	35 domestic fowl, 3 song thrush, 3 galliformes
Poggio dell'Amore	1 AD	4	—	100	—	—
Podere Terrato	1 AD	—	—	—	—	—
Marzuolo Phase 2	1 AD	100	14	43	43	10 domestic fowl, 6 red deer, 1 hare, 5 other avian
Tombarelle Phase 2	1 AD	7	28.6	71.4	—	—
Marzuolo Phase 3	2–3 AD	138	17.4	31.9	50.7	13 domestic fowl, 2 red deer, 2 hare, 5 other avian
Case Nuove Phase 1.3	2–3 AD	5	—	20	80	14 domestic fowl, 1 red deer
Pievina Phases 2.1 and 2.2	4–5 AD	269	22.3	42.8	34.9	6 wild boar, 2 red deer, 1 roe deer, 2 domestic fowl
Case Nuove Phase 2	4–5 AD	174	18.3	45.9	35.3	13 red deer, 20 domestic fowl
Tombarelle Phase 3	5 AD	80	46.3	20	33.8	2 domestic fowl, 1 wild boar
Tombarelle Phase 4	10–11 AD	25	8	68	24	1 domestic fowl, 1 red deer
Marzuolo Phase 4	11–12 AD	31	16.1	48.4	35.5	4 red deer, 1 hare
Case Nuove Phase 3	13 AD	20	—	40	60	1 domestic fowl, 69+ hare, 1 red deer, 1 roe deer

[a] NISP total (cattle+sheep/goat+pig)

[b] NISP of other principal mammalian and avian taxa present (only typically consumed taxa listed)

Table 19.3b Minimum Number of Individuals (=MNI) by Taxon, Age Category, and Site, All Sites (MM)

		CATTLE			SHEEP/GOAT			PIG		
Site	Date century	juvenile	subadult	adult	juvenile	subadult	adult	juvenile	subadult	adult
Case Nuove Phase 1.1	1 BC	—	—	1	—	1	—	—	—	1
Marzuolo Phase 1	1 BC	—	2	5	1	1	3	1	2	4
Tombarelle Phase 1	1 BC	—	—	2	—	1	1	—	1	1
Pievina Phase 1	1 BC–1 AD	—	—	1	—	—	1	—	1	1
Case Nuove Phase 1.2	1 BC–1 AD	—	—	—	1	1	1	1	2	—
Poggio dell'Amore	1 AD	—	—	—	—	—	1	—	—	—
Podere Terrato	1 AD	—	—	—	—	—	—	—	—	—
Marzuolo Phase 2	1 AD	—	—	2	1	1	2	1	1	1
Tombarelle Phase 2	1 AD	—	—	1	—	—	1	—	—	—
Marzuolo Phase 3	2–3 AD	—	1	1	1	2	2	—	3	2
Case Nuove Phase 1.3	2–3 AD	—	—	—	—	1	—	1	1	—
Pievina Phases 2.1 and 2.2	4–5 AD	—	1	2	1	1	4	1	4	3
Case Nuove Phase 2	4–5 AD	—	2	1	1	1	4	2	3	—
Tombarelle Phase 3	5 AD	—	1	3	—	—	3	1	2	4
Tombarelle Phase 4	10–11 AD	—	—	1	3	—	—	2	—	—
Marzuolo Phase 4	11–12 AD	—	—	1	—	1	2	1	1	1
Case Nuove Phase 3	13 AD	—	—	—	1	1	—	1	1	—

Table 19.3c Cattle – Relative Frequency by Skeletal Part Category, Calculated on the Basis of NISP and MNE, All Sites (MM)

		NISP					MNE				
Site	**Date century**	**n**	**1°**	**2°**	**ext.**	**head**	**n**	**1°**	**2°**	**ext.**	**head**
Case Nuove Phase 1.1	1 BC	7	—	14.2	—	85.7	2	—	33.3	—	66.7
Marzuolo Phase 1	1 BC	94	35.1	12.8	31.9	20.2	16	37.5	18.8	25	18.8
Tombarelle Phase 1	1 BC	21	19	4.8	33.3	42.9	4	25	25	25	25
Pievina Phase 1	1 BC–1 AD	3	—	33.3	—	66.7	2	—	50	—	50
Case Nuove Phase 1.2	1 BC–1 AD	—	—	—	—	—	—	—	—	—	—
Poggio dell'Amore	1 AD	—	—	—	—	—	—	—	—	—	—
Podere Terrato	1 AD	—	—	—	—	—	—	—	—	—	—
Marzuolo Phase 2	1 AD	14	7.1	14.3	28.6	50	5	20	20	20	40
Tombarelle Phase 2	1 AD	2	—	—	50	50	2	—	—	50	50
Marzuolo Phase 3	2–3 AD	24	16.7	4.2	29.2	50	5	20	20	20	40
Case Nuove Phase 1.3	2–3 AD	—	—	—	—	—	—	—	—	—	—
Pievina Phases 2.1 and 2.2	4–5 AD	60	13.3	10	31.7	45	8	37.5	12.5	25	25
Case Nuove Phase 2	4–5 AD	32	3.1	6.3	—	90.6	5	20	10	—	60
Tombarelle Phase 3	5 AD	37	27	10.8	8.1	54.1	9	22.2	22.2	11.1	44.4
Tombarelle Phase 4	10–11 AD	2	—	—	—	100	1	—	—	—	100
Marzuolo Phase 4	11–12 AD	5	—	—	40	60	2	—	—	50	50
Case Nuove Phase 3	13 AD	—	—	—	—	—	—	—	—	—	—

1° = primary cut (includes scapula, humerus, pelvis, femur)
2° = secondary cut (includes radius, ulna, tibia, fibula)
ext. = limb extremities (includes metapodials, carpals, tarsals, phalanges)
head = cranium, mandible, all teeth

Table 19.3d Sheep/Goat – Relative Frequency by Skeletal Part Category, Calculated on the Basis of NISP and MNE, All Sites (MM)

		NISP					MNE				
Site	**Date century**	**n**	**1°**	**2°**	**ext.**	**head**	**n**	**1°**	**2°**	**ext.**	**head**
Case Nuove Phase 1.1	1 BC	3	—	—	—	100	1	—	—	—	100
Marzuolo Phase 1	1 BC	58	2.5	13.8	15.5	65.5	11	9.1	18.2	27.3	45.5
Tombarelle Phase 1	1 BC	7	—	57.1	28.6	14.3	3	—	33.3	33.3	33.3
Pievina Phase 1	1 BC–1 AD	6	16.7	16.7	16.7	50	4	25	25	25	25
Case Nuove Phase 1.2	1 BC–1 AD	25	44	8	28	20	8	37.5	12.5	25	25
Poggio dell'Amore	1 AD	4	—	—	—	100	1	—	—	—	100
Podere Terrato	1 AD	—	—	—	—	—	—	—	—	—	—
Marzuolo Phase 2	1 AD	43	18.6	11.6	30.2	39.5	11	18.2	18.2	27.3	36.4
Tombarelle Phase 2	1 AD	5	—	—	—	100	1	—	—	—	100
Marzuolo Phase 3	2–3 AD	44	22.7	11.4	15.9	50	13	23.1	15.4	23.1	38.5
Case Nuove Phase 1.3	2–3 AD	—	—	—	—	—	—	—	—	—	—
Pievina Phases 2.1 and 2.2	4–5 AD	115	4.3	14.8	13	67.8	13	15.4	23.1	23.1	38.5
Case Nuove Phase 2	4–5 AD	77	5.2	19.5	9.1	66.2	12	16.7	25	16.7	41.7
Tombarelle Phase 3	5 AD	16	—	6.3	—	93.8	4	—	25	—	75
Tombarelle Phase 4	10–11 AD	17	29.4	41.2	29.4	—	7	28.6	42.9	28.6	—
Marzuolo Phase 4	11–12 AD	15	13.3	26.7	6.7	53.3	6	16.7	33.3	16.7	33.3
Case Nuove Phase 3	13 AD	8	—	37.5	25	37.5	4	—	50	25	25

1° = primary cut (includes scapula, humerus, pelvis, femur)
2° = secondary cut (includes radius, ulna, tibia, fibula)
ext. = limb extremities (includes metapodials, carpals, tarsals, phalanges)
head = cranium, mandible, all teeth

Table 19.3e Pig – Relative Frequency by Skeletal Part Category, Calculated on the Basis of NISP and MNE, All Sites (MM)

		NISP					MNE				
Site	**Date century**	**n**	**1°**	**2°**	**ext.**	**head**	**n**	**1°**	**2°**	**ext.**	**head**
Case Nuove Phase 1.1	1 BC	4	50	—	—	50	2	50	—	—	50
Marzuolo Phase 1	1 BC	148	9.5	10	15.5	64.9	18	22.2	22.2	22.2	33.3
Tombarelle Phase 1	1 BC	8	12.5	12.5	25	50	4	25	25	25	25
Pievina Phase 1	1 BC–1 AD	13	7.7	—	7.7	84.5	4	25	—	25	50
Case Nuove Phase 1.2	1 BC–1 AD	48	31.3	6.3	25	37.5	10	30	20	20	30
Poggio dell'Amore	1 AD	—	—	—	—	—	—	—	—	—	—
Podere Terrato	1 AD	—	—	—	—	—	—	—	—	—	—
Marzuolo Phase 2	1 AD	43	23.3	11.6	41.9	23.3	10	20	30	20	30
Tombarelle Phase 2	1 AD	—	—	—	—	—	—	—	—	—	—
Marzuolo Phase 3	2–3 AD	68	11.8	10.3	36.8	41.2	14	21.4	21.4	21.4	35.7
Case Nuove Phase 1.3	2–3 AD	—	—	—	—	—	—	—	—	—	—
Pievina Phases 2.1 and 2.2	4–5 AD	92	13.8	6.3	13.8	66	15	20	13.3	13.3	53.3
Case Nuove Phase 2	4–5 AD	62	9.7	11.3	8.1	71	11	18.2	18.2	18.2	45.5
Tombarelle Phase 3	5 AD	27	—	—	—	100	2	—	—	—	100
Tombarelle Phase 4	10–11 AD	6	83.3	16.7	—	—	3	66.7	33.3	—	—
Marzuolo Phase 4	11–12 AD	11	45.5	—	36.4	18.2	4	50	—	25	25
Case Nuove medieval well	13 AD	15	60	26.7	6.7	6.7	6	33.3	33.3	16.7	16.7

1° = primary cut (includes scapula, humerus, pelvis, femur)
2° = secondary cut (includes radius, ulna, tibia, fibula)
ext. = limb extremities (includes metapodials, carpals, tarsals, phalanges)
head = cranium, mandible, all teeth

Table 19.3f Relative Frequency of UNID Counts by Site, All Sites (MM)

			SMALL-SIZED MAMMAL				MEDIUM-SIZED MAMMAL		
Site	Date century	n	rib	long bone	vertebrae	other	rib	long bone	vertebrae
Case Nuove Phase 1.1	1 BC	72	—	—	—	—	9.7	30.6	11.1
Marzuolo Phase 1	1 BC	754	—	0.3	0.1	—	11.4	36.4	7.2
Tombarelle Phase 1	1 BC	105	—	—	—	—	7.6	25.7	2.9
Pievina Phase 1	1 BC–1 AD	49	—	—	—	—	4.1	49	4.1
Case Nuove Phase 1.2	1 BC–1 AD	331	2.4	2.1	—	—	33.8	30.5	7.9
Poggio dell'Amore	1 AD	2	—	—	—	—	—	100	—
Podere Terrato	1 AD	10	—	—	—	—	—	100	—
Marzuolo Phase 2	1 AD	197	0.5	—	—	—	26.4	45.7	6.6
Tombarelle Phase 2	1 AD	3	—	—	—	—	—	100	—
Marzuolo Phase 3	2–3 AD	325	1.5	—	—	1.2	17.5	44.6	4.3
Case Nuove Phase 1.3	2–3 AD	9	—	—	—	—	22.2	44.4	—
Pievina Phases 2.1 and 2.2	4–5 AD	648	0.8	0.1	—	—	11.3	59.1	2.2
Case Nuove Phase 2	4–5 AD	321	0.6	0.3	0.9	0.3	20.6	49.5	5.9
Tombarelle Phase 3	5 AD	164	—	—	—	—	—	25	1.2
Tombarelle Phase 4	10–11 AD	31	—	—	—	—	54.8	6.5	6.5
Marzuolo Phase 4	11–12 AD	21	—	—	—	—	14.3	62.9	5.7
Case Nuove Phase 3	13 AD	9	—	—	—	—	11.1	33.3	—

MEDIUM-SIZED MAMMAL			LARGE-SIZED MAMMAL						AVIAN
scapula/ pelvis	cranium	other	rib	long bone	vertebrae	scapula/ pelvis	cranium	other	
4.2	1.4	—	18.1	18.1	1.4	2.8	1.4	1.4	—
2.8	4.9	0.8	5.3	18.7	8.8	1.7	0.5	0.9	0.3
1.9	1.9	4.8	17.1	18.1	3.8	7.6	5.7	0.9	—
2	4.1	—	20.4	16.3	—	—	—	—	—
4.5	4.2	0.3	1.2	0.3	0.3	—	—	—	12.4
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
4.6	6.1	0.5	1	30	1	1.5	0.5	—	2
—	—	—	—	—	—	—	—	—	—
2.2	3.4	0.6	3.4	13.5	2.8	—	3.1	1.2	0.6
11.1	—	—	11.1	11.1	—	—	—	—	—
0.8	4	1.5	1.4	14.5	1.7	0.3	2	—	0.3
1.9	0.9	3.4	—	3.7	0.6	—	4.7	0.3	6.2
1.2	—	—	15.9	34.1	1.8	1.2	19.5	—	—
—	3.2	—	—	12.9	6.5	3.2	—	—	—
—	11.4	—	—	—	—	—	5.7	—	—
11.1	—	—	11.1	33.3	—	—	—	—	—

19.4 Pollen - Composite Pollen Table, All Sites/Phases in Chronological Order (AMM/ER)

Table 19.4 Pollen - Composite Pollen Table, All Sites/Phases in Chronological Order (AMM/ER)

	Sites	San Martino	Tombarelle	Colle Massari	Poggio Amore
	Label / area	SM	TB Area II	CM	PA
	Number of samples	8	3	7	5
MEAN POLLEN SPECTRA PER SITE/PHASE	Chronology	late 2nd c. BC to mid-1st c. BC	40 BC–10 BC	c. 0 BC/AD	0–50 AD
Concentration (p/g)		**37278**	**64050**	**2247**	**12621**
Arboreal pollen	**AP**	**16**	**4**	**20**	**13**
Non Arboreal pollen	**NAP**	**84**	**96**	**80**	**87**
ADOXACEAE	*Sambucus*				
ANACARDIACEAE	*Pistacia*		0.1		
AQUIFOLIACEAE	*Ilex aquifolium*				
BETULACEAE	Alnus indiff.	2.0		0.6	0.5
	Alnus cf. *incana*				
	Alnus cf. *glutinosa*			0.1	
	Betula	0.2			0.1
	Carpinus betulus	0.02		0.03	0.04
	Corylus	1.0		0.2	0.4
	Ostrya/Carpinus orientalis type	0.3		0.1	0.2
CANNABACEAE	*Celtis*				
	Humulus				
CISTACEAE	*Cistus*	0.2			0.1
	Helianthemum	0.1		0.5	0.5
CUPRESSACEAE	*Juniperus* type	0.1			
CORNACEAE	*Cornus mas*				
CUPRESSACEAE	*Cupressus*				
EPHEDRACEAE	*Ephedra fragilis* type				
ERICACEAE	*Erica*	0.8	0.1	0.3	0.2
FAGACEAE	*Castanea sativa*			0.1	
	Quercus cf. *cerris*			0.8	
	Quercus deciduous indiff.	3.8	2.8	9.2	4.4
	Quercus ilex type			0.4	
	Fagus	0.1		0.2	0.3
FABACEAE	*Ulex* type			0.03	
GROSSULARIACEAE	*Ribes* type				
MYRTACEAE	*Myrtus*				
JUGLANDACEAE	*Juglans*			0.1	

Podere Terrato		Podere Marzuolo		Case Nuove	Tombarelle
PT	PM 10000	PM 14000	PM 11000	CN	TB Area III
11	3	11	12	15	4
0–50 AD	50–70 AD	late 2nd to 3rd c. AD		late 4th to mid-5th c. AD	early to mid-5th c. AD
16567	12969	11850	8251	9247	24639
17	12	7	10	14	16
83	88	93	90	86	84
			0.02		
	0.7	0.1	0.1		
			0.04		
1.6	0.5	0.7		0.8	0.1
			0.8	0.5	
				0.2	
0.2		0.3	0.2	0.03	0.4
0.2	1.5	0.6	0.4	0.4	0.4
0.6		0.1	0.1	0.3	0.1
0.05		0.1	0.6	0.01	
			0.05		
0.2	0.5		0.1	0.4	
0.4	0.6	0.1	0.3	0.8	
				0.1	
0.1			0.02		
	0.6				
0.02				0.01	
0.5	1.8	0.4	0.2	2.7	
	0.1	0.2		0.01	
4.8	1.7		2.1	4.5	7.4
0.1	0.2	0.2			
0.1			0.2	0.1	
			0.01		
	0.1				
0.03				0.01	
	0.2	0.2	0.3		

Table 19.4 cont'd Pollen - Composite Pollen Table, All Sites/Phases in Chronological Order (AMM/ER)

	Sites	San Martino	Tombarelle	Colle Massari	Poggio Amore
	Label / area	SM	TB Area II	CM	PA
	Number of samples	8	3	7	5
MEAN POLLEN SPECTRA PER SITE/PHASE	Chronology	late 2nd c. BC to mid-1st c. BC	40 BC–10 BC	c. 0 BC/AD	0–50 AD
Concentration (p/g)		**37278**	**64050**	**2247**	**12621**
Arboreal pollen	**AP**	**16**	**4**	**20**	**13**
Non Arboreal pollen	**NAP**	**84**	**96**	**80**	**87**
OLEACEAE	*Fraxinus* cf. *angustifolia*				
	Fraxinus excelsior type	0.02	0.1		
	Fraxinus ornus type			0.1	
	Ligustrum vulgare type				
	Olea	0.05		0.1	0.1
	Oleaceae indiff.		0.1		
	Phillyrea				
	Syringa cf.				
PINACEAE	*Abies*	1.0		0.3	0.2
	Picea	0.2		0.03	
	Pinus	5.6	0.8	5.8	5.6
RHAMNACEAE	*Rhamnus* type			0.2	0.1
ROSACEAE	*Prunus*		0.2	0.2	0.1
	Rubus type	0.1			
	Rosa				
	Sorbus	0.04			
SALICACEAE	*Populus*			0.2	
	Salix	0.2	0.1	0.1	0.1
TAMARICACEAE	*Tamarix*				
TILIACEAE	*Tilia*	0.1		0.1	
ULMACEAE	*Ulmus*				
VITACEAE	*Vitis*				
ALISMATACEAE	*Alisma*			0.2	
	Sagittaria sagittifolia	0.2		0.1	0.8
AMARANTHACEAE	*Atriplex*			0.1	
	Beta type				
	Chenopodium	0.02	0.4	0.5	2.0
	Chenopodiaceae indiff.	0.9	0.5		
ALLIACEAE	*Allium* type	0.6			
APIACEAE	Apiaceae indiff.		0.7	1.0	1.6
	Daucus type	0.1			
	Heracleum cf.				
	Orlaya				
	Peucedanum palustre		0.1		

Podere Terrato		Podere Marzuolo		Case Nuove	Tombarelle
PT	PM 10000	PM 14000	PM 11000	CN	TB Area III
11	3	11	12	15	4
0–50 AD	50–70 AD	late 2nd to 3rd c. AD		late 4th to mid-5th c. AD	early to mid-5th c. AD
16567	12969	11850	8251	9247	24639
17	12	7	10	14	16
83	88	93	90	86	84
0.3				0.01	
					0.5
	0.1			0.2	
			0.7		
0.1	0.1	0.4	0.1	0.1	0.4
			0.01	0.1	0.2
	0.2				
0.02					
0.3	0.1		0.6	0.2	
	0.1	0.03		0.04	
6.0	0.5	1.2	2.3	1.5	5.7
0.03		0.2	0.05		
0.02	0.1	0.2	0.02	0.1	0.3
0.02				0.01	
0.6			0.02		
		0.03		0.1	
	0.1	0.1	0.2	0.01	
0.6	0.1	0.1	0.1	0.3	
	0.9				
0.02	0.6	0.03	0.03	0.1	
			0.1		0.2
0.1	0.8	0.2	0.02	0.03	
0.5	0.2	0.1	0.02	0.6	
					0.1
	1.2	0.9	2.8	0.8	0.6
1.4					0.4
	0.3	0.2			
1.2	1.4	1.8	1.0	0.5	0.2
				0.04	
				0.01	
					0.1
0.1					

Table 19.4 cont'd Pollen - Composite Pollen Table, All Sites/Phases in Chronological Order (AMM/ER)

	Sites	San Martino	Tombarelle	Colle Massari	Poggio Amore
	Label / area	SM	TB Area II	CM	PA
	Number of samples	8	3	7	5
MEAN POLLEN SPECTRA PER SITE/PHASE	Chronology	late 2nd c. BC to mid-1st c. BC	40 BC–10 BC	c. 0 BC/AD	0–50 AD
Concentration (p/g)		**37278**	**64050**	**2247**	**12621**
Arboreal pollen	**AP**	**16**	**4**	**20**	**13**
Non Arboreal pollen	**NAP**	**84**	**96**	**80**	**87**
ARACEAE	*Lemna*	0.1		0.1	0.4
ASTERACEAE	*Anthemis/Matricaria* type				
	Ambrosia	0.1			
	Artemisia	0.2	0.7	0.5	0.7
	Aster type	3.5	1.5	3.3	3.3
	Asteroideae indiff.	0.4	0.2		
	Carduus	0.04	0.1	0.6	0.3
	Centaurea nigra type	2.3	3.4	5.1	4.4
	Centaurea jacea			0.2	
	Cichorieae	42.4	25.2	37.1	34.0
BORAGINACEAE	Boraginaceae indiff.	0.1			
	Echium				
	Symphytum				
BRASSICACEAE	*Brassica* type			0.6	0.8
	Brassicaceae indiff.	1.0	0.3	0.9	0.7
	Hornungia type		0.3	0.03	
CAMPANULACEAE	*Campanula*				
CANNABACEAE	*Cannabis*			0.1	
CARYOPHYLLACEAE	*Arenaria*			0.1	
	Caryophyllaceae indiff.	1.0	1.7	0.4	1.1
	Silene dioica type			0.03	
	Paronychia type				
CONVOLVULACEAE	*Convolvulus*	0.3		0.8	1.1
	Cuscuta europaea type	0.02		0.2	0.04
CRASSULACEAE	*Sedum*				
CYPERACEAE	Cyperaceae indiff.	0.9	6.7	3.7	1.7
	Cyperus				
	Scirpus lacustris		0.2		
DIPSACACEAE	*Dipsacus*			0.3	
	Knautia	0.04			0.2
	Scabiosa				
EUPHORBIACEAE	Euphorbiaceae indiff.	0.05			0.1
	Euphorbia		0.1		

Podere Terrato	Podere Marzuolo			Case Nuove	Tombarelle
PT	PM 10000	PM 14000	PM 11000	CN	TB Area III
11	3	11	12	15	4
0–50 AD	50–70 AD	late 2nd to 3rd c. AD		late 4th to mid-5th c. AD	early to mid-5th c. AD
16567	12969	11850	8251	9247	24639
17	12	7	10	14	16
83	88	93	90	86	84
0.3					
	0.5			0.3	
			1.1	0.1	
0.5	0.1	0.3	0.4	0.7	0.5
5.4	6.7	4.7	3.8	3.1	1.4
0.03					1.0
0.2	1.0	1.2	0.8		
5.3	5.9	5.6	5.1	2.1	1.5
31.6	13.9	23.0	46.5	33.7	15.5
					0.1
0.1					
	0.1				
1.2	0.7	0.5	0.7	0.7	0.9
0.7	1.4	1.1	0.2	3.7	1.9
				0.04	0.6
0.02	0.2	0.1			
0.02		0.1			
1.8	4.4	2.2	2.2	1.7	1.1
0.02					0.1
0.1				0.01	
0.2	0.8	0.3	0.1	0.01	0.1
0.3			0.02	0.01	
0.1			0.02		
1.3	2.5	1.1	0.9	1.9	4.3
	0.1	0.1			
0.02	0.3		0.1		0.1
0.1	0.1		0.4		0.1
0.02					
			0.1		
0.2	0.5		0.1	0.4	

Table 19.4 cont'd Pollen - Composite Pollen Table, All Sites/Phases in Chronological Order (AMM/ER)

	Sites	San Martino	Tombarelle	Colle Massari	Poggio Amore
	Label / area	SM	TB Area II	CM	PA
	Number of samples	8	3	7	5
MEAN POLLEN SPECTRA PER SITE/PHASE	Chronology	late 2nd c. BC to mid-1st c. BC	40 BC–10 BC	c. 0 BC/AD	0–50 AD
Concentration (p/g)		**37278**	**64050**	**2247**	**12621**
Arboreal pollen	**AP**	**16**	**4**	**20**	**13**
Non Arboreal pollen	**NAP**	**84**	**96**	**80**	**87**
FABACEAE	*Astragalus*	0.1			
	Coronilla cf.			0.03	
	Dorycnium	0.8		0.1	0.9
	Fabaceae indiff.	3.1	1.1	0.5	0.8
	Hedysarum	0.04			
	Lathyrus				
	Lotus	0.3		0.3	0.3
	Medicago				0.1
	Trifolium type	0.8	0.6	0.4	1.0
	Trifolium cf. *pratense*	0.3			
	Vicia			0.1	
GERANIACEAE	Geraniaceae indiff.		0.1	0.1	
	Erodium	0.1			
HALOGARACEAE	*Myriophyllum*	0.02			0.1
HYDROCHARITACEAE	*Hydrocharis*				
HYPERICACEAE	*Hypericum*				
IRIDACEAE	*Crocus*			0.03	
LAMIACEAE	Lamiaceae indiff.	0.3	0.1	2.2	2.8
	Mentha type	0.1	0.2	2.1	0.2
	Salvia			0.7	
	Stachys type				
LILIACEAE	Liliaceae	0.3	0.1		
HYACINTHACEAE	*Scilla*			0.1	
MALVACEAE	*Malva*			0.1	0.1
NYMPHAEACEAE	*Nymphaea alba* type	0.1		0.03	0.4
	Nuphar	0.1			
OROBANCHACEAE	*Euphrasia* type			0.1	
PAPAVERACEAE	*Corydalis*				
	Fumaria				
	Papaver				
PLANTAGINACEAE	*Plantago* cf. *atrata*				
	Plantago lanceolata type			0.1	
	Plantago indiff.	0.6	2.7	0.3	1.2

Podere Terrato	Podere Marzuolo			Case Nuove	Tombarelle
PT	PM 10000	PM 14000	PM 11000	CN	TB Area III
11	3	11	12	15	4
0–50 AD	50–70 AD	late 2nd to 3rd c. AD		late 4th to mid-5th c. AD	early to mid-5th c. AD
16567	12969	11850	8251	9247	24639
17	12	7	10	14	16
83	88	93	90	86	84
0.1			0.02		0.2
0.5	0.9	0.5	0.2	0.6	
1.0		1.1	1.2	2.3	0.9
			0.1	0.1	
			0.1		
0.1	0.4	0.4	0.02	0.1	0.2
0.4	0.4				
0.5	1.5	0.7	0.9		2
	0.5		0.2	1.5	0.3
	0.1	0.03			
0.1	0.4	0.03	0.1		
			0.03		
0.02					
		0.1			
2.4	0.9	2.0	0.5	1.1	0.4
0.2	1.3	0.5	0.2	0.5	2.4
0.02	0.2		0.03		
				0.01	0.2
0.02			0.1	0.7	0.2
0.02		0.03	0.2		
0.4		0.03	0.5	0.1	
				0.1	
	0.2				
	0.6	0.5	0.2		
	0.3	0.1			
		0.5	0.4		
1.2	3.6	4.8	1.2	0.8	1.6

Table 19.4 cont'd Pollen - Composite Pollen Table, All Sites/Phases in Chronological Order (AMM/ER)

	Sites	San Martino	Tombarelle	Colle Massari	Poggio Amore
	Label / area	SM	TB Area II	CM	PA
	Number of samples	8	3	7	5
MEAN POLLEN SPECTRA PER SITE/PHASE	Chronology	late 2nd c. BC to mid-1st c. BC	40 BC–10 BC	c. 0 BC/AD	0–50 AD
Concentration (p/g)		**37278**	**64050**	**2247**	**12621**
Arboreal pollen	**AP**	**16**	**4**	**20**	**13**
Non Arboreal pollen	**NAP**	**84**	**96**	**80**	**87**
POACEAE - cerealia	*Avena/Triticum* group	0.5	17.0	0.7	0.2
	Hordeum group	0.4		1.4	0.7
	Cerealia indiff.	0.5		1.5	2.1
	Secale				
POACEAE - wild grass	*Phragmites australis* cf.	0.3		0.2	0.7
	Poaceae-wild grass group	14.4	26.3	4.6	9.7
POLYGONACEAE	*Persicaria maculosa* type			0.03	
	Polygonum aviculare type				
	Polygonum persicaria type	0.02			0.2
	Rumex				
POTAMOGETONACEAE	*Potamogeton*	0.2			
PONTEDERIACEAE	*Pontederia* cf.				
PRIMULACEAE	*Anagallis*			0.1	0.1
RANUNCULACEAE	*Helleborus niger*	0.1			
	Ranunculaceae indiff.	0.2	0.2	0.2	0.5
	Ranunculus type	0.9	1.4	1.3	3.7
	Thalictrum				
ROSACEAE	*Alchemilla*				
	Filipendula	0.6		0.03	
	Potentilla				0.04
	Rosaceae indiff.	0.9	0.8	0.4	0.6
RUBIACEAE	*Galium* type	0.04			
RUTACEAE	*Ruta* cf.				
SAXIFRAGACEAE	*Saxifraga* cf.	0.5		0.03	0.8
SCROPHULARIACEAE	*Euphrasia* type	0.04		0.2	0.1
	Linaria type	0.1			
	Scrophularia type				
	Scrophulariaceae indiff.	0.2	0.4		0.2
	Verbascum cf.		0.1		
SOLANACEAE	*Hyoscyamus niger*				0.04
	Solanum nigrum type	0.7		0.2	0.3
	Solanaceae indiff.				
TYPHACEAE	*Typha latifolia* type	0.2			0.04

Podere Terrato	Podere Marzuolo			Case Nuove	Tombarelle
PT	PM 10000	PM 14000	PM 11000	CN	TB Area III
11	3	11	12	15	4
0–50 AD	50–70 AD	late 2nd to 3rd c. AD		late 4th to mid-5th c. AD	early to mid-5th c. AD
16567	12969	11850	8251	9247	24639
17	12	7	10	14	16
83	88	93	90	86	84
0.4	1.2	2.2	0.6	1.2	4.2
1.1	4.3	5.0	1.2	1.0	0.2
1.8	4.5	1.5	1.3	2.2	
0.1			0.02	0.1	
0.5		0.2	0.1	0.4	0.1
9.9	9.4	14.4	4.5	16.1	21.1
0.1					0.1
	0.4		0.03		
		0.2		0.1	
0.1	0.4		0.05		
	0.4	0.03		0.1	
0.01					
				0.1	
			0.1	0.01	
2.1	4.5	2.6	1.0	1.0	4.2
			0.2	0.9	2.4
	1.4	0.2	0.7		
		0.4			
0.1		0.2	0.4	0.2	
0.02				0.1	
	0.5	0.5	0.3	1.6	2.0
			0.1		
0.02					
0.4	0.2			0.1	
0.1					
					0.1
0.6	0.1		0.05	0.1	0.2
					0.1
0.4		0.1	0.1	0.1	
		0.03			
0.1		0.1		0.6	

Table 19.4 cont'd Pollen - Composite Pollen Table, All Sites/Phases in Chronological Order (AMM/ER)

	Sites	San Martino	Tombarelle	Colle Massari	Poggio Amore
	Label / area	SM	TB Area II	CM	PA
	Number of samples	8	3	7	5
MEAN POLLEN SPECTRA PER SITE/PHASE	Chronology	late 2nd c. BC to mid-1st c. BC	40 BC–10 BC	c. 0 BC/AD	0–50 AD
Concentration (p/g)		**37278**	**64050**	**2247**	**12621**
Arboreal pollen	**AP**	**16**	**4**	**20**	**13**
Non Arboreal pollen	**NAP**	**84**	**96**	**80**	**87**
URTICACEAE	*Urtica dioica* type	0.4	0.2	0.2	0.2
	Urtica cf. *pilulifera*	0.2		0.3	0.9
VALERIANACEAE	*Valeriana*	0.05			
	Valerianella				
VIOLACEAE	*Viola*				
Indeterminable		1.2	2.3	5.6	5.0
POLLEN SUM (mean)		**543**	**364**	**441**	**466**

Podere Terrato	Podere Marzuolo			Case Nuove	Tombarelle
PT	PM 10000	PM 14000	PM 11000	CN	TB Area III
11	3	11	12	15	4
0–50 AD	50–70 AD	late 2nd to 3rd c. AD		late 4th to mid-5th c. AD	early to mid-5th c. AD
16567	12969	11850	8251	9247	24639
17	12	7	10	14	16
83	88	93	90	86	84
0.1	0.8	1.4	0.6	0.6	0.1
0.6	2.2	0.3	0.5	0.3	
0.02					
				0.1	
4.7	3.9	10.1	6.0	0.8	11.3
546	530	302	481	504	300

19.5 Coins - Catalogue of Coins (SCE)

Coins from the Pievina excavations in 2009 and Case Nuove in 2010 were identified by Dott.ssa Flavia Marani.

Pievina

SF 201001. Rome. Roman Republic, Denarius. ca. 90–82 BC.
AR; 2.8 g; 21.2 mm.
Laureate head (Apollo?) r., behind, scepter; with control-symbol and control-letter.
R/ Traces of quadriga or horseman r..
cf. RRC 342/4–5; RRC 361/1b–c.
2009. SU 1507.

SF 201002. Rome. Faustina I or II, As. 141–161 AD/161–176 AD.
AE; 9.06 g; 23.9 mm.
Legend illegible; Traces of bust r.
R/ Traces of standing figure.
2009. SU 3001.

SF 201003. Rome. Faustina II, As. 161–176 AD.
AE; 9.17 g; 24.4 mm.
[FAV]STINA AVG[VSTA]; Bust of Faustina II r.
R/ Legend illegible.
2009. SU 1031.

SF 201004. Rome. Tiberius, As. 22–23 AD.
AE; 9.7 g; 29.3 mm.
[DR]V[SVS] CAESAR [TI] A[V]G F DIVI A[VG]. Head r.
R/ [P]ONTI[F T]RIBVN [POT]ES[T ITER]. SC in field.
RIC I^2 Tiberius 45.
2009. SU 1018.

SF 201005. Rome, Claudius, As. 41–50 AD.
AE; 8.4 g; 28.0 mm.
[TI CLAVDIV]S C[AESAR AVG PM TR P IMP]. Head l.
R/ Traces of standing figure (Minerva?) between SC.
2009. SU 1500.
RIC I^2 Claudius 100.

SF 201006. Rome. Roman Republic, As. 211 to mid-2nd c. BC.
AE; 19.68 g; 19.9 mm.
Illegible.
R/ Illegible.
2009. SU 1512.

SF 201007. Eastern Med. mint. Tetrarchy, AE fraction. 295–307 AD.
AE; 2.25 g; 21.4 mm.
Illegible.
R/ CONCORDIA MILIT[VM]. Emperor standing r. receiving Victory from Jupiter standing to l.
2009. SU 1019.

SF 201008. Rome. Maximian, AE fraction. 297–298 AD.
AE; 3.13 g; 18.6 mm.
MAXIMIANVS [NOB C *or* NOB CAES]; Radiate head to r.
R/ V[OT/XX] inside wreath.
RIC VI Rome 88b, 89b.
2009. SU 1029.

SF 201009. Uncertain mint. Uncertain authority, Antoninianus. 260–294 AD.
AE/AR; 0.89 g; 15.1 mm.
Legend illegible; Radiate head to r.
R/ Illegible.
2009. SU 1030.

SF 201010. Uncertain mint. Uncertain authority, AE fraction or nummus. Late 3rd–4th c. AD.
AE; 3.74 g; 22.9 mm.

Legend illegible.
R/ Legend illegible; Traces of female figure to r. (?).
2009. SU 1029.

SF 201011. Uncertain mint. Constantius II or Constans, AE3. 341–348 AD.
AE; 2.34 g; 15.3 mm.
Legend illegible; Traces of bust to r.
R/ Legend illegible; Traces of two victories, each holding wreath.
cf. SF 205006.
2009. SU 1029.

SF 201012. Constantinople. Julian, AE3. 355–361 AD.
AE; 1.48 g; 15.6 mm.
[D N CL IV]LIANVS NO[B CAES]. Bust r.
R/ Falling horseman (*Fel. Temp. Reparatio*). In exergue CONS[.]
RIC VIII Constantinople 138, 140–141, 143, 145, 147.
LRBC II 87, 2050–2052.
2009. SU 1006.

SF 201013. Rome. Valentinian II, Theodosius I, and Arcadius, AE4. 383–387 AD.
AE; 0.65 g; 11.1 mm.
Legend illegible; Traces of bust r.
R/ [VICTORIA AVGGG]. Two facing victories, each holding a crown. Between them a globe. Exergue illegible.
LRBC II 62, no. 785–788, 791–793.
2009. SU 3001.

SF 201014. Uncertain mint. Uncertain authority, AE3. 353–361. AD.
AE; 1.63 g; 16.4 mm.
Bust r.
R/ Falling horseman (*Fel. Temp. Reparatio*).
2009. SU 1535.

SF 201015. Uncertain mint. Uncertain authority, AE3. Second half of the 4th c. AD.
AE; 0.98 g; 16.7 mm.
Illegible.
R/ Illegible (Victory to l.)?
2009. SU 3001.

SF 201016. Uncertain mint. Uncertain authority, AE4. Late 4th-First half of 5th c. AD.
AE; 0.86 g; 12.7 mm.
Legend illegible; Traces of bust r.
R/ Illegible.
2009. SU 1018.

SF 201017. Uncertain mint. Uncertain authority, AE3. Second half of the 4th c. AD.
AE; 0.83 g; 14.0 mm.
Illegible.
R/ Trace (Victory to l.?).
2009. SU 1027.

SF 201018. Uncertain mint. Uncertain authority, AE3. Second half of the 4th c. AD.
AE; 0.8 g; 14.3 mm.
Illegible.
R/ Traces of the issue (Victory to l.?).
2009. SU 3001.

SF 201019. Uncertain mint. Uncertain authority, AE3. 353–361 AD.
AE; 0.72 g; 13.4 mm.
Illegible.
R/ Falling horseman (*Fel. Temp. Reparatio*).
2009. SU 1030.

SF 201020. Uncertain mint. Constans Caesar or Delmatius Caesar, AE nummus. 335–338 AD.
AE; 1.62 g; 14.1–15.8 mm.
[...]CAES. Bust r.
R/ Two soldiers with one standard (*Gloria Exercitus*).
2009. SU 3001.

SF 201021. Aquileia / Rome. Arcadius (?), AE4. 395–403 AD.
AE; 0.81 g; 13.0 mm.
[D N] AR?CA[DIVS...]. Bust r.
R/ Victory and captive, cross in field (*Salus Rei Publicae*).
RIC X Aquileia 1245; RIC X Rome 1245–1246.
2009. SU 1029.

SF 201022. Uncertain mint. Uncertain authority, AE4 or minimus. Mid-5th c. AD.
AE; 0.68 g; 9.3 mm.
Illegible.
R/ Illegible.
2009. SU 1023.

SF 201023. Uncertain mint. Uncertain authority, AE3 or AE4. 4th century AD.
AE; 0.58 g; 14.1 mm.
Illegible.
R/ Illegible.
2009. SU 1037.

SF 201024. Uncertain mint. Uncertain authority, AE4. Mid-4th c. AD.
AE; 1.15 g; 13.9 mm.
Legend illegible; Diademed bust to r.
R/ Illegible.
2009. SU 1022.

SF 201025. Uncertain mint. Uncertain authority, AE4. First half of the 5th c. AD.
AE; 0.69 g; 11 mm.
Illegible.
R/ Illegible.
2009. SU 1039.

SF 201026. Uncertain mint. Uncertain authority, AE4 or minimus. Mid-5th c. c. AD.
AE; 0.63 g; 8.8–9.9 mm.
Illegible.
R/ Illegible.
2009. SU 1507.

SF 201027. Uncertain mint. Uncertain authority, AE4 or minimus. Mid-5th c. AD.
AE; 0.61 g; 10.5 mm.
Illegible.
R/ Illegible.
2009. SU 1029.

SF 201028. Uncertain mint. Uncertain authority, AE4. 5th–6th c. AD.
AE; 0.61 g; 8.8–10.5 mm.
Illegible.
R/ Illegible.
2009. SU 3001.

SF 201029. Uncertain mint. Uncertain authority, AE4 or minimus. Mid-5th c. AD.
AE; 0.46 g; 9 mm.
Illegible.
R/ Illegible.
2009. SU 1039.

SF 201030. Uncertain mint. Uncertain authority, AE4 or nummus. Mid-second half of 5th c. AD.
AE; 0.34 g; 8.9 mm. Fragmentary.
Illegible.
R/ Illegible.
2009. SU 1029.

SF 201031. Uncertain mint. Uncertain authority, AE minimus. Second half of 5th c. AD.
AE; 0.28 g; 6.9–7.0 mm.
Illegible.
R/ Illegible.
2009. SU 1008.

SF 201032. Uncertain mint. Uncertain authority, AE4 or minimus. Mid-5th c. AD.
AE; 0.27 g; 8.9 mm.
Illegible.
R/ Illegible.
2009. SU 3001.

SF 201033. Uncertain mint. Uncertain authority, AE4 or nummus. Second half of 5th c. AD.
AE; 0.14 g; 5.6–6.2 mm.
Illegible.
R/ Illegible.
2009. SU 1018.

SF 201034. Kingdom of Italy. Umberto I, 10 centesimi. 1893–1894c. AD.
Copper; 10 g; 30.3 mm.
Traces of bust l.
R/ Probably [10 / ADNTESIMI / 198.?]. Trace of wreath of laurel and oak.
cf. Pagani 1965:34 no. 613–616.
2009. SU 1500.

SF 201035. Uncertain mint. Uncertain authority. Unclassifiable fragment.
AE; 0.28 g. Fragment.
Illegible.
R/ Illegible.
2009. SU 1019.

SF 201036. Uncertain mint. Uncertain authority. AE nummus. 335–341 AD.
AE; 0.23 g. Fragment.
Bust r.
R/ Two soldiers with one standard (*Gloria*

Exercitus).
2009. SU 1030.

SF 201037. Uncertain mint. Uncertain authority. Unclassifiable fragment.
AE; 0.18 g. Fragment.
Illegible.
R/ Illegible.
2009. SU 3001.

Case Nuove

SF 205001. Rome. Augustus, As. 15 BC.
AE; 9.17 g; 24.4 mm.
Inscription illegible. Traces of bare head of Augustus r.
R/ C PLOTI[VS RVFVS IIIVIR AAAFF]; Traces of head of Numa r.
RIC I² 390–393.
2010. SU 5001.

SF 205002. Uncertain mint. AE4. Late 4th to first half of the 5th c. AD.
AE; 1.23 g; 12.5 mm.
Illegible.
R/ Traces.
2010. SU 5008.

SF 205003. Uncertain mint. AE3 or AE4. Second half of the 4th c. AD.
AE; 1.5 g; 16 mm.
Illegible.
R/ Emperor with r. hand dragging captive (Type *Gloria Romanorum / Virtus Exercitus Romanorum*).
2010. SU 5022.

SF 205004. Uncertain mint. AE4. Late 4th-first half of the 5th c. AD.
AE; 1.43 g; 12.5 mm.
Illegible.
R/ Illegible.
2010. SU 5022.

SF 205005. Uncertain mint. AE4. Second half of the 4th c. AD.
AE; 1.81 g; 15.3 mm.
Illegible.
R/ Illegible.
2010. SU 5036.

SF 205006. Uncertain mint. AE4. 383–392 or 430–3 AD.
AE; 1.18 g. 12 mm.
Illegible.
R/ Two victories facing one another.
2010. SU 5023.

SF 205007. Uncertain mint. AE4. Late 4th to first half of the 5th c. AD.
AE; 0.66 g; 12.2 mm.
Illegible.
R/ Trace of victory to l.?
2010. SU 5023.

SF 205008. Uncertain mint. AE3. Second half of the 4th century AD.
AE; 1.33 g; 14 mm.
Illegible.
R/ Illegible.
2010. SU 5023.

SF 205009. Uncertain mint. AE4. Late 4th to first half of the 5th c. AD.
AE; 0.95 g; 11 mm.
Illegible.
R/ Illegible.
2010. SU 5023.

Podere Terrato

SF 208001. Rome, Augustus, Quadrans. 9 BC.
AE; 3 g; 17–16 mm.
III VIR AAAFF; Altar.
R/ LAMIA SILIVS ANNIVS; Cornucopia between SC.
RIC I² Augustus 422.
2011. SU 8001.

SF 208002. Rome. Tiberius, As. 21–22 AD.
AE; 10 g; 27–26 mm.
DRVSVS CAESAR TI AVG F DIVI AVG; Head of Drusus l.
R/ PONTIF TRIBVN POTEST ITER around large SC.
RIC I² Tiberius 45.
2011. SU 8002.

SF 208003. Rome. Claudius, Dupondius. 41–54 AD.
AE; 11 g; 28–27 mm.
TI CLAVDIVS CAESAR AVG P M TR P IMP; Head of Claudius l.
Minerva advancing r. between SC.
RIC I² Claudius 100.
2011. SU 8001.

SF 208004. Rome. Augustus, As. 7 BC.
AE; 10 g; 26–26 mm.
CAESA]R AVGVST PONT MAX [; Head of Augustus r.
R/ M MAECILIVS TVLLVS III VIR AAAFF around large SC.
RIC I² Augustus 435.
2011. SU 8001.

SF 208005. Rome. Gaius, Dupondius. 37–41 AD.
AE; 12 g; 29–28 mm.
GERMANICVS CAESAR; Germanicus in quadriga r.
SIGNIS READPT - DEVICTIS GERM - S C; Germanicus standing l. holding scepter.
RIC I² Gaius 57.
2011. SU 8001.

Colle Massari

SF 207001. Kingdom of Italy, 5 Centesimi. 1919–1937.
Copper; 3.25 g; 20 mm.
VITTORIO EMANUELE II RE D'ITALIA; Head of Vittorio Emanuele II l.
R/ Sheath of wheat. 5 c.
2011. SU 7030.

Marzuolo

SF 210001. Uncertain mint. AE. 4th c. AD.
AE; 3.75 g; 21–21 mm.
Illegible.
R/ Illegible.
2012. SU 10000.

SF 211001. Rome. Sabina, Dupondius or As. 118–136 AD.
AE; 12.25 g; 25–23 mm.
[SABINA AVG]VSTA HADRIANI AV[G P P]; Diademed, draped bust of Sabina r.
R/ [PIETAS AVG]; Pietas standing front, looking left, with her hands on the heads of two children. S C on either side.
RIC II Hadrian 1040.
2012. SU 11000.

SF 211002. Rome. Tiberius, As. 21–22 AD.
AE; 9.46 g; 25–25 mm.
DRVSVS CAES]AR TI AVG F [DIVI AVG N] ; Head of Drusus, bare, l.
R/ [PONTIF TRIB]VN POTEST ITER around large SC.
RIC I² Tiberius 45. cf. SF 201004.
2012. SU 11000.

SF 211003. Spain. Gnaeus Pompey, As. 46–45 BC.
AE; 25.74 g; 28–27 mm.
Laureate head of Janus, above |.
R/ Ship's prow r., IMP in exergue. Above prow, CN] MA[G].
RRC 471/1.
2012. SU 11000.

SF 211004. AE Unknown mint. 1st–2nd c. AD.
AE; 10.27 g; 25–23 mm.
Legend illegible. Traces of male bust r.
R/ Illegible.
2012. SU 11016.

SF 211005. Rome. Vespasian, As. 71 AD.
AE; 6.92 g; 26–25 mm.
] VESPASIAN AVG [; Traces of laureate head of Vespasian r.
R/ IVDAEA CAPTA; SC in exergue. Palm tree, Judea seated to right, traces of cuirass and arms.
cf. RIC II² Vespasian 305.
2012. SU 11016.

SF 211006. Rome. Antoninus Pius, Sestertius. Early 161 AD.
AE; 21.67 g; 35–33 mm.
AVRELIVS CAESAR AVG PII F; Bust of M. Aurelius r.
R/ Legend illegible, [TR POT XV] COS [III] in exergue. Quadriga advancing left, [S C].
RIC III Antoninus Pius 1360b.
2012. SU 11016.

SF 211007. Rome. Severus Alexander, Sestertius. 230 AD.

AE; 16.32 g; 29–29 mm.
IMP SEV ALEXANDER AVG; Laureate bust of Severus Alexander r.
R/ P M TR P VIIII COS III PP. Sol with radiate crown standing facing l., holding whip and globe, SC in field.
RIC IV Severus Alexander 500.
2012. SU 11016.

SF 211008. Rome. Galba, Denarius. July 68–January 69 AD.
AR; 3.26 g; 17–17 mm.
IMP] SER GALBA CAESAR AVG; Laureate head of Galba r.
R/ DIVA AVGVSTA; Livia standing l. holding scepter.
RIC I² Galba 185.
2012. SU 11000.

SF 211009. Rome (?). Aurelian (?), Antoninianus. 270–275 AD.
AR; 3.1 g; 21–20 mm.
Legend illegible. Traces of radiate bust of Aurelian (?) r.
R/ LAE]TI[TIA] A[VG]; Laetitia standing left, holding patera (?).
cf. RIC V.1 Aurelian 50.
2012. SU 11018.

SF 211010. Rome. Claudius, As. 50–54 AD.
AE; 9.21 g; 27–26 mm.
TI CLAVDIVS CAESAR AVG P M TR P IMP P P; Bare head of Claudius l.
R/ LIBERTAS AVGVSTA; Libertas standing facing with pileus, extending l. hand, in between SC.
RIC I² Claudius 113.
2012. SU 11028.

SF 211011. Rome. Pupienus, Sestertius. April–June 238 AD.
AE; 18.4 g; 30–30 mm.
IMP CAES PVPIENVS MAXIMVS AVG; Laureate, draped, cuirassed bust of Pupienus r.
R/ CONCORDIA AVGG; Concordia seated l. holding patera and double cornucopiae. SC in exergue.
RIC IV Pupienus 20.
2012. SU 11029.

SF 211012. Rome. Maximinus Thrax. January 236–April 238 AD.
AE; 19.13 g. 30–29 mm.
MAXIMINVS PIVS AVG GERM; Laureate, draped bust of Maximinus Thrax r.
R/ PAX AVGVSTI; Pax standing l. holding branch and scepter, SC in field.
RIC IV Maximinus I 81.
2012. SU 11036.

SF 211013. Rome. Augustus, Quadrans. 4 BC.
AE; 2.56 g; 15–15 mm.
Illegible [IIIVIR A A A F F; Altar with bowl-shaped top, hung with garland].
R/ C NAEVIVS CAPELLA around S C.
RIC I² Augustus 466.
2012. SU 11037.

SF 211014. Rome (?). Roman Republic, As. ca. 211–146 BC.
AE; 24.05 g; 32–33 mm.
Traces of head of Janus.
R/ Traces of ship's prow r.
cf. RRC 197–198B/1b, but this entry could belong to a number of types issued during the 2nd or possibly first century BC.
2012. SU 11048.

SF 211015. Rome. Claudius, As. 41–43 AD.
AE; 9.98 g; 30–28 mm.
GERMAN[ICVS] CAE[SAR TI] AVG F [DIVI AVG N]; Bare head of Germanicus r.
R/ [TI CLAVDIVS CAESAR] AVG GERM P M [TR P IMP P P] around large SC.
RIC I² Claudius 106.
2012. SU 11022.

SF 211016. Rome. Claudius Gothicus, Antoninianus. 268–270 AD.
AE; 3.07 g; 22–19 mm.
IMP C M AVR C[LAVDIVS AVG]; Radiate, draped bust of Claudius Gothicus r.
R/ SECVRIT AVG; Securitas standing front, looking left, legs crossed, leaning on column and holding short scepter. XI in right field.
RIC V.1 Claudius Gothicus 100.
2012. SU 11029.

SF 212000. Uncertain mint. AE3. 4th c. AD.
AE; 1.51 g; 14–13 mm.

Illegible.
R/ Illegible.
2013. SU 12002.

SF 212001. Uncertain mint. Gallienus, Antoninianus. 260–268 AD.
AR; 1.61 g; 18–17 mm.
GALL]IENVS; Radiate bust of Gallienus r.
R\ Illegible.
2013. SU 12002.

SF 212002. Rome. Maxentius, AE3/4. 310–312 AD.
AE; 1.65 g; 17–16 mm.
MAXENTIVS P F AVG; Head of Maxentius r.
R/ VOT QQ MVL XX in wreath. Four lines in wreath. No mintmark.
RIC VI Roma 281c.
2013. SU 12004.

SF 212003. AE3/4 Rome. Maxentius, AE3/4. 310–312 AD.
AE; 1.91 g; 17–17 mm.
MAXENTIVS P F AVG; Head of Maxentius r.
R/ VOT QQ MVL X in wreath. Four lines in wreath. No mintmark.
RIC VI Roma 281a.
2013. SU 12004.

SF 212004. Cyzicus. Constantius Chlorus, AE2. 294–299 AD.
AE; 2.62 g; 23–21 mm.
FL VAL CONSTANTIVS [NO]B CAES; Draped, radiate bust of Constantius r.
R/ CONCORDIA MILITVM; Constantius standing right in military dress, receiving Victory on globe from Jupiter facing left, leaning on scepter, star over KB between them.
RIC VI Cyzicus 19a.
2013. SU 12020.

SF 212005. Rome (?). Maximian, AE2. 297–298 AD.
AE; 1.48 g; 22–21 mm.
IMP C MAXIMIAN[VS; Radiate bust of Maximian r.
R/ VOT XX [; Three lines in wreath. Mintmark illegible.
cf. RIC VI Roma 75.
2013. SU 12020.

SF 212006. Rome. Augustus, Quadrans. 9 BC.
AE; 2.71 g; 18–11 mm.
LAMIA] SILIVS ANNI[VS; Clasped hands holding caduceus.
R/ [I]II VIR A A A [F F]; Large SC in field.
RIC I^2 Augustus 420.
2013. SU 12004.

SF 213012. Rome. Salonina, Sestertius. ca. 255–257 AD.
AE; 15.08 g; 27–25 mm.
[CORNELIA] SALO[NINA AVG]; Diademed and draped bust of Salonina r.
Legend illegible [IVNO REGINA]; Juno standing l. holding patera in right hand and long scepter in left. SC in field.
RIC V.1 Salonina 46.
2013. SU 13008.

SF 213015. Rome. Probus, Antoninianus. 276 AD.
AR; 3.61 g; 22–21 mm.
IMP C M AVR PROBVS AVG; Radiate cuirassed bust of Probus r.
R/ FIDES MILIT. Fides standing, holding scepter and transverse ensign. XXIΓ in exergue.
RIC V.2 Probus 151.
2013. SU 13006.

SF 214002. Italy. Octavian/Augustus, Uncertain denomination. ca. 38 BC.
AE; 18.2 g; 30–26 mm.
DIVI [F CAESAR]; Head of Octavian r., border of dots.
R/ [DIVOS] IVLI[V]S; Wreathed head of Caesar r., border of dots.
RRC 535/1.
2013. SU 14005.

SF 214018. Uncertain mint. AE fraction. 1st–2nd c. AD.
AE; 8.97 g; 25–24 mm.
Traces of bust r.
R/ Illegible.
2013. SU 14008.

SF 214023. Rome. Denarius, 99–96 BC.
AR; 1.41 g; 17–14 mm.

Laureate head of Apollo r.
R/ ROMA in exergue; traces of pile of shields, victory standing to r.
RRC 335/2.
2013. SU 14009.

SF 214040. Uncertain mint. AE3. 4th c. AD.
AE; 1.15 g; 13–12 mm.
Illegible.
R/ Illegible.
2013. SU 14007.

SF 214069. Rome. Claudius, Quadrans. 5 January–31 December 42 AD.
AE; 2.03 g; 18–16 mm.
[TI CLA]VD[I]VS CAESA[R AVG]; Three legged modius.
R/ PON M [TR P] IMP P P COS II around large SC in field.
RIC I^2 Claudius 90.
2013. SU 14034.

Tombarelle

SF 217013. Uncertain mint. AE2? 4th c. AD?
AE; 2 g; 20–14 mm.
Illegible.
R/ Illegible.
2014. SU 17002.

19.6 Small Finds (SCE)

19.6a Catalogue of Small Finds

Table 19.6b Small Find Counts by Site

Table 19.6c Iron Nail Dimensions

Table 19.6d Copper Nail Dimensions

19.6a Catalogue of Small Finds

This catalogue provides a listing of the objects in metal, worked bone, and stone, which were recovered in the course of the RPP. Earthen or stone construction materials (such as fragments of daub) which were accessed into the project finds database are not included in this listing.

The following abbreviations are used in the catalogue:

diam. - diameter
dim. – dimension(s)
fr. – fragment(s)
h. – height
int. – intact
l. – length
max. – maximum
min. – minimum
pres. – preserved (as in max. pres. dim. – maximum preserved dimensions)
sec. – section
th. – thickness
w. – width

Anvils

Anvils were defined as a large L-shaped iron bar, whose craft purposes could range from metalworking (such as a bick iron, a smaller anvil held in a vice) to leatherworking, or as a means to sharpen scythes or other tools.

SF 310089. Iron anvil. 2 fr., 57 g.
Two joining fragments of L-shaped iron bar.
Dimensions 75 mm x 78 mm; max. dim. of section 17 x 11 mm.
2012. SU 10033.

SF 310145. Iron anvil. 1 int., 690 g.
Iron L-shaped bar, bent at right angle with tapering rectangular sections toward terminals, likely used as an anvil.
Dimensions: h. 219 mm; w. 128 mm; max. sec. 24 x 22 mm; sec. at terminals 10 x 7 mm, 13 x 11 mm.
2012. SU 10083.

SF 310146. Iron anvil. 1 int., 652 g.
Iron L-shaped bar, bent at right angle with tapering rectangular sections toward terminals. Probably an

anvil. Nearly identical to SF 310145.
Dimensions: h. 189 mm; w. 102 mm; max. sec. 24 x 22 mm; sec. at terminals 22 x 12 mm, 14 x 9 mm.
2012 SU 10083.

Appliqués

The term appliqué has been used to refer to any unidentified metal object which contains an obverse and reverse, decorated on one side, which could have been affixed or applied to another surface. The purpose of such objects could be decorative or ornamental, as a specific function cannot be deduced from the shape of the object itself.

SF 310029. Copper alloy appliqué. 1 int., 6 g.
Curved, of uncertain design; section is semiovoid with flat underside; some mortar attached on both sides; perhaps broken at one terminal. The object could potentially be a fragment of a phallic amulet or pendant, but precise comparanda were not found.
Dimensions: l. 40 mm; h. 3 mm; thickness at terminal 8 mm; thickness at curved end 9 mm.
2012. SU 10000.

Awls

SF 301051. Copper alloy awl. 1 fr., 2 g.
Small copper alloy conical object tapering to a point, based of its dimensions and shape, most likely an awl, Manning Type 3b.
Dimensions: l. 30 mm, terminal 4 x 3 mm tapering to point.
Manning (1985:38–39, fig. 9).
2009. SU 1003.

SF 310512. Iron awl. 1 int., 7 g.
Small, rhomboid iron awl, which corresponds to Manning Type 3b. Fig. 15.
Dimensions: 47 x 10 x 6 mm.
Manning (1985:38–39, fig. 9), Gaitzsch (1980:370–371, tables 47.236, 47.239, 47.241).
2012. SU 10000.

Bindings

SF 314024. Copper alloy binding. 1 fr., 2 g.
Copper alloy fragment of a ring in curved 'C' shape, cut half-way through the 'C,' which results in slight twist of one terminal.
Dimensions: l. = 17 mm, w. = 20 mm, th. = 6 mm tapering to 5 mm.
2013. SU 14008.

SF 305085. Copper alloy binding. 1 int., 3 g.
Copper alloy artifact, perhaps a binding, formed by folding a piece of metal into a rectangle. A nearly identical iron example is attested at Verulamium, ca. 155–160 AD.
Dimensions: 22 x 18 x 6 mm.
Comparanda: Manning (1972:188, no. 129, fig. 69).
2010. SU 5023.

Buttons

SF 305053. Copper alloy button (?). 3 fr., 1 g.
Small circular fragments of copper alloy, so thoroughly corroded that it is difficult to find an interpretation of this artifact. Probably a button, but the lack of the metal loop on the underside makes this a questionable identification.
Dimensions: Max. pres. diam. 18 mm.
2012. SU 5012.

Chains

SF 308011. Copper alloy chain. 5 fr, 1 g.
Five small curving fragments of copper alloy, probably links from a chain.
Dimensions: Max. pres. dim. of largest fr.: 9 x 8 mm, max. th. 2 mm.
2011. SU 8028.

SF 314006. Copper alloy chain. 1 fr., 1g.
Small, flat bronze tab, broken at one terminal, with a loop measuring at the other end. This loop could perhaps be a fragment of a chain, as attested by the

bronze example from Phase IV at Settefinestre.
Dimensions: l. 19 mm, w. 10 mm tapering to 7 mm, th. = 1.5 mm; diam. of loop 6 mm.
Comparanda: Ricci (1985:249, table 68.10, 254).
2013. SU 14022.

Collar

Collars are defined as circular or ovoid bands of metal. The function of such objects cannot be identified with certainty, likely possessing a range of purposes involving agricultural or industrial activities.

SF 301005. Iron collar. 1 int., 25 g.
Heavily corroded fragment of iron tube or socket, perhaps a poletip, if closed on one end. Otherwise, a small collar whose function cannot be determined.
Dimensions: Max. pres. h. 27 mm; max. outer diam. 23 mm; max. inner diam. 17 mm; min. outer diam. 22 mm; min. inner diam. 145 mm; max. th. 3.5 mm, min th. 2 mm.
Comparanda: Manning (1972:174, no. 38, fig. 64, or, 188, no. 125, fig. 125).
2009. SU 1031.

SF 305047. Iron collar. 1 int., 115 g.
Iron collar or sleeve in the shape of a cylindrical ellipse. This find could have served various functions, such as part of the press facility at Case Nuove, or part of the hub of an axle or its bushing, although it lacks the characteristic spurs on the exterior. The size of the interior space would not seem appropriate for a wheel axle, but rather is more fitting for a door pivot or handle. It would appear to have been used in conjunction with SF 305027, due to its similar dimensions.
Dimensions: Max. diam. 64 mm; min. diam. 44 mm; max. th. 11 mm.
Comparanda: For axle rings and bushings, see Künzl (1993:69–79, F21a–F88), as well as Manning (1972:172, no. 32, fig. 64).
Date: 1st c. AD.

Cord

Cords (cording, wire) comprised any small fragment of copper alloy or iron with a circular section that could not be ascribed to a clear function. Shapes included cords that were straight, curved, bent, or sometimes intertwined.

SF 308009. Copper alloy cord. 1 fr., 1 g.
Small curved fragment of bronze wire.
Dimensions: Max. pres. l. 12 mm; max. pres. w. 2 mm.
2011. SU 8004.

SF 310007. Iron cord. 1 fr., 1 g.
Straight fragment of iron cord, heavily oxidized.
Dimensions: Max dim. 47 x 1.5 x 1.5 mm.
2012. SU 10003.

SF 310024, 310026, 310048, 310513. Iron cord. 4 fr., 5 g.
Four fragments of iron wire, heavily oxidized. Fragments are: (1) straight; (2) bent around in ovoid loop, perhaps broken at one terminal, with an ovoid section; (3) twisted loop of iron cord with circular section; and (4) bent in three places into irregular form.
Dimensions: (1) Max. pres. dim. 35 x 1 x 1 mm; (2) max. l. 34 mm (bent), ca. 69 mm (straight), section diam. 2 mm; (3) max. l. (bent), 46 mm, section 2 x 2 mm.; (4) Max. l. (unbent) 63 mm, section dim. 1.5 x 1.5 mm.
2012. SU 10000.

SF 310063. Iron cord. 1 fr., 1 g.
Straight fragment of iron cord, oxidized.
Dimensions: Max. pres. l. 51 mm; circular section 2 x 2 mm.
2012. SU 10009.

SF 310071. Iron cord. 1 fr. 2 g.
Fragment of twisted iron wire, oxidized.
Dimensions: Max. pres. l. 47 mm; max. section 4 x 2 mm.
2012. SU 10033.

Decorations, Unidentified

This category is used as a catch-all for what appear to be non-utilitarian copper alloy fragments whose identification is currently uncertain.

SF 310004. Copper alloy decoration (?). 1 fr., 3 g.

Copper alloy fragment of serpentine, tapering form. Possibly sculptural, the handle of a vessel, or perhaps from a fibula(?), the fragment projects from a fragmented section, curves outward, and then twists downward. The surface is decorated with several raised knots.
Dimensions: Max dim.: h. 20 mm; w. 7 m.
2012. SU 10001.

SF 310129. Copper alloy decoration (?). 2 fr., 1 g.
Two small fragments of copper alloy of uncertain function, possibly sculptural or pieces of a handle of small cup. Would appear to be part of the same object as SF 310004.
Dimensions: Max. pres. dim. of each fragment: 8.5 x 5 x 3 mm; 9 x 4 x 3 mm.
Comparanda: SF 310004.
2012. SU 10055.

SF 311007. Copper alloy decoration (?). 1 fr. 1 g.
Small fragment of worked copper alloy cording. Aside from its fragmentary state, the metal is well preserved. The fragment curves gently in an S-shape, with ovoid section, and comes to point at terminals. It could possibly be a fragment of a vessel handle, although the curvature and size does not favor such an identification. The most accurate definition of this object is possibly as a fragment of a decoration or ornament.
Dimensions: Max. pres. l. (curving): 21 mm; max. width of section 2 mm.
2012. SU 11000.

Door bolts and Locks

SF 310010. Copper alloy lock bolt. 1 int., 5 g.
Oar- or L-shaped copper alloy slide or lock bolt with nine rectangular indentations on either side, arranged in two rows of three with one elongated rectangle toward the terminal. This component was internal to the lock, and would have been used to raise the tumblers and then slide the bolt (Crummy 1983:124; Allison 2006:31–32).
Dimensions: l. 32 mm; max. h. 10 mm; min. h. 5; thickness 3 mm.
Comparanda: Nearly identical to Hinds (2017) (Hampshire, England). cf. examples from the Casa del Fabbro, I.10.7, Pompeii (Allison 2006: pl. 93, cat. 1422–23) and the Insula del Menandro, I.6, (Allison 2006: pl. 120, cat. 1978, pl. 121, cat. 1985–87).
1st through early 4th century AD.
2012. SU 10025.

SF 310136. Iron door bolt. 1 int., 66 g.
Iron bolt with back plate attached; oxidized, probably for door. Bolt is bent backwards around; cap is rounded and flat in shape. The fact that this find comes from a topsoil context makes an identification difficult, as no precise comparison from antiquity can as of yet be secured.
Dimensions: Dim. of back plate: 66 x 30 x 2 mm; dim. of clasps for bolt 17 x 7 x 6 mm. Bolt l. (straight) ca. 124 mm, l. (bent) 76 mm, cap 20 mm diam.; max. th. 6 mm.
2012. SU 10000.

Double Rings

SF 301010. Copper alloy double rings. 2 fr., 40 g.
Two joining fragments of "double rings" (*anelli gemini*), a heavy spiked spectacle-shaped copper alloy fitting with central bridge, expanding to form two large loops for the straps of the cavesson or bridle. Two prominent teeth project from the underside for fixing into the nose of a draft animal or horse. Some oxidation of bronze has occurred, with a break in one of the terminals. These objects are widespread in continental Europe from the Iron Age onward.
Dimensions: Max. h. 26 mm; h. of central bridge 17 mm; max. thickness of circular terminal 7 mm; max. l. 69 mm; max. thickness of central bridge 12 mm; max. l. of teeth 18 mm.
Comparanda: Adam (1984:105–106). See Chapter 4 on Pievina and Collins-Elliott (2018).

Dress pins

SF 307001. Copper alloy dress pin. 1 int., 1 g.
Small bronze dress pin, curving slightly as it tapers upward toward the finial, which turns from a globular to a flat tapering shape. The finial is also decorated on side with lines and stippled dots. Some oxidization.
Dimensions: Max. pres. dim. 37 x 7 x 6 mm.
2011. SU 7002.

SF 309001. Copper alloy dress pin (?). 1 fr., 1 g.
Fragment of copper alloy wire, curved in two joints into irregular shape; possible fragment of dress or brooch pin.
Dimensions: Max pres. area 38 x 20 mm; width of wire 2 mm.
2011. SU 9001.

SF 312007. Copper alloy dress pin (?). 1 fr., 1 g.
Thin, flat fragment of copper alloy in slightly curving, triangular shape. Some corrosion.
Dimensions: 21 x 19 x 7 mm.
2013. SU 12004.

SF 312011. Copper alloy dress pin (?). 1 fr., 1 g.
Thin copper alloy fragment, in slightly curved, triangular shape. Some corrosion.
Dimensions: 31 x 27 x 8 mm.
Comparanda: cf. SF 312007.
2013. SU 12020.

SF 312021. Copper alloy dress pin (?). 1 fr., 1 g.
Thin copper alloy fragment, with slightly curved, subtriangular shape. Some corrosion.
Dimensions: 22 x 19 x 8 mm.
2013. SU 12008.

Fibulae

SF 308001. Copper alloy fibula. 1 fr.,1 g.
Fragment of the terminal of the bow of a fibula, curving in wide 'C' shape.
Dimensions: Max. pres. l. 32 mm.
2011. SU 8001.

SF 308003. Copper alloy fibula. 1 fr., 5 g.
Copper alloy bow-shaped fibula, *Aucissa* type. The bow is made of flat strip of copper alloy with a flattened ridge along the center. The hinge is circular, with a triangular catchplate that terminates in a knob. Pin missing. Heavily corroded. Fibulae of the *Aucissa* type are common in Italy and Gaul.
Dimensions:
Comparanda: Allison (2006:78, cat. no. 311, fig. 49.8); Cool (2016:28, no. 14–16, fig. 2.2).
Date: Early 1st c. AD.
2011. SU 8007.

SF 308010. Copper alloy fibula. 1 fr., 2 g.
Fragment of a copper alloy bow fibula of the *Aucissa* type. Bow of the fibula presents a circular section, fragmented above where the hinge would be. Catchplate is triangular, ending in a rounded terminal. Pin missing. Fibular is heavily corroded.
Dimensions: Max. l. 40 mm.
Comparana: See SF 308003.
Date: First half of the 1st c. AD.
2011. SU 8028.

Finger Rings

SF 311021. Copper alloy finger ring. 1 fr., 2 g.
Copper alloy finger ring. Section is subovoid with flat interior; two small horn-like protrusions around bevel.
Dimensions: Dim. of ring: 19 x 16 mm; max dim. of section 6 x 2 mm.
2012. SU 11012.

Flows

Lead flows consisted of irregularly shaped fragments or pieces of lead, which could have been used in any number of different activities, from vessel repair to metalworking.

SF 304004. Lead flows. 2 fr., 2 g.
Two joining fragments.
Dimensions: Max. pres. l. 1.7 cm, max. pres. diam. 0.8 cm.
2010. SU 4024.

SF 305039, 305043. Lead flows. 4 fr., 123 g.
Dimensions: Max. dim. of each: 54 x 42 x 4 mm, 115 x 23 x 5 mm, 108 x 13 x 3 mm, 28 x 24 x 2 mm.
2010. SF 5014.

SF 305081. Lead flow. 1 fr., 72 g.
Dimensions: Max. dim. 83 x 44 x 7 mm.
2010. SU 5058.

SF 310046. Lead flow. 1 fr., 7 g.
Dimensions: Max. pres. dim. 37 mm (bent), ca. 41 mm (straight). Section 8 x 3 mm.
2012. SU 10000.

Harness Buttons

SF 301052. Copper alloy harness button. 1 int., 4 g.
Copper alloy harness fitting, used for holding two strips of leather together. Flat, subcircular caps at either end. Rove has circular section.
Dimensions: l. 12 mm; diam. of caps 13 mm. Section of rove 6 x 5 mm.
Comparanda: Empúries, Museu d'Arqueologia de Catalunya, inv. 4661. Artifacts BTH-4007.
Date: Mid- to late 5th c. AD (Pievina Phase 2.3).
2009. SU 1008.

SF 301056. Copper alloy harness button. 1 int., 8 g.
Copper alloy harness fitting, used for holding two strips of leather together. One cap is flat, subcircular, the other is subconical with striated decoration. Rove has subcircular section.
Dimensions: l. 18 mm. Flat head dim. 14.5 x 13 mm, subconical head dim. 13 x 13 x 8 mm. Section of rove diam. 6 mm.
Comparanda: cf. Empúries, Museu d'Arqueologia de Catalunya, inv. 4661. Artifacts BTH-4007.
Date: Mid-to-late 5th c. AD (Pievina Phase 2.4).
2009. SU 1006.

Harness Mounts

SF 305025, 305026. Copper alloy harness mount. 2 fr., 7 g.
Two joining fragments of small, cross-shaped, copper alloy sheet with surface decoration and boss at center, with one small hole at the end of three of the four arms. Functionally this object would appear to be a harness mount or junction, although there have yet to be located stylistically similar examples.
Dimensions: Max diam. 65 mm. Holes in arms diam. 0.1 cm. Max thickness 0.5 mm.
Comparanda: Müller (2002: no. 588, plate 53); Boube-Piccot (1980: no. 114, plate 38).
Date: 1st c. AD (Case Nuove Phase 1).
2010. SU 5014.

Harness Pendants

SF 305011. Copper alloy harness pendant. 1 int., 4 g.
Small copper alloy harness pendant. Decorated on one side, flat on the other. Lower finial is globular, while the pendant hook is folded up and over, ending in a wolf's head.
Dimensions: Max. h. 33 mm, max. width 22 mm, max. thickness 4 mm.
Comparanda: Identical to SF 305038. A very similar find comes from Feugère (2002:74, fig. 3, no. 2).
Date: ca. first half of the 1st c. AD.
2010. SU 5014.

SF 305038. Copper alloy harness pendant. 1 int, 4 g.
Small copper alloy harness pendant. Decorated on one side, flat on the other. Lower finial is globular, while the pendant hook is folded up and over, ending in a wolf's head.
Dimensions: Max. h. 33 mm, max. width 22 mm, max. thickness 4 mm.
Comparanda: Identical to SF 305011.
Date: ca. first half of the 1st c. AD.
2010. SU 5014.

Hematite

SF 310008. Iron hematite. 1 fr., 10 g.
Dimensions: 20 x 17 x 14 mm.
2012. SU 10003.

SF 310013. Iron hematite. 1 fr., 1 g.
Dimensions: 10 x 8 x 6 mm.
2012. SU 10025.

Hinges

SF 305080. Iron hinge. 3 fr., 70 g.
Fragment of long iron strip tapering toward end, possibly door hinge. Recovered intact but currently in three fragments.
Dimensions: Max l. 143 mm, max, h. 38 mm, max. thickness 4 mm.
2010. SU 5023.

Hooks

SF 301006. Iron hook. 1 int., 23 g.
Subrectangular sectioned iron hook with the end returning toward the stem to form a loop, in the shape

of a shepherd's crook; heavily oxidized.
Dimensions: Max. h. 104 mm; max. width 41 mm; section at terminal 10 x 13 mm.
Date: Mid- to late 5th c. AD (Pievina Phase 2.3).
2009. SU 1008.

SF 310112. Iron hook. 1 int., 35 g.
Iron bar with terminal curving back around to body to form a loop; oxidized. The length of this hook indicates its most likely function as a linchpin.
Dimensions: l. 123 mm; section 9 x 8 mm tapering to 3 x 3 mm; dim. of hook, horizontal axis (ext./int.): 23/15 mm; vertical axis (ext./int.): 25/13 mm.
2012. SU 10033.

Knobs

SF 314076. Copper alloy knob. 1 int., 29 g.
Copper alloy knob with a circular head and rounded, hollow cross section.
Dimensions: Diam. of head 29 mm, l. 15 mm, diam. of terminal 15 mm.
2013. SU 14037.

Lamina

Metal lamina, both copper alloy and iron, could serve a variety of purposes, and the fragmentary nature of the finds hinders an accurate interpretation of the use of many of the objects. Fragments of curved lamina, if not bent in the happenstance of their discard, could have been a part of the iron tire that went around wooden wheels (Ulrich 2007:210). Lamina from Pompeii have been interpreted as binding to protect woodworking (Allison 2006:192–193, after Manning 1972:188–190). It could perhaps be hazarded that copper alloy would be more likely to find use in this way in the domain of domestic furniture, while iron would be more common in non-domestic, functional contexts (such as with a gate, or part of a cart), but such a generalization should not be pressed too far. Precise comparanda are unlikely to be found for such objects (Manning 1985:142).

SF 305069. Iron lamina. 3 fr., 220 g.
Three large fragments of iron sheet or bar.
Dimensions: Max dim. of each: 78 x 61 x 28 mm, 77 x 35 x 10 mm, 63 x 31 x 12 mm.
2010. SU 5014.

SF 305048. Copper alloy lamina. 39 fr., 21 g.
Thirty-nine small fragments of copper alloy sheet.
Measurements not taken.
2010. SU 5014.

SF 310056. Copper alloy lamina. 1 fr., 3 g.
Fragment of copper alloy strip, slightly curving and coming to point at one terminal.
Dimensions: Max. pres. l. 55 mm; section max. 6 x 3 mm.
2012. SU 10033.

SF 319002. Copper alloy lamina. 1 fr., 5 g.
Fragment of thin copper alloy strip, rectangular in shape, bent over in one corner.
Dimensions: Max. pres. dim. 36 x 25 x 1 mm.
2014. SU 19001.

SF 305006, 305021. Iron lamina. 4 fr., 47 g.
Three fragments of iron sheet; one fragment of small iron band, oxidized.
Dimensions: Max. pres. dim. of lamina: 54 x 33 x 4 mm, 43 x 31 x 4 mm, 29 x 23 x 3 mm; Max. pres. dim. of band 60 x 29 x 10 mm.
2010. SU 5001.

SF 305012, 305014, 305024, 305030, 305031, 305041, 305068, 305076. Iron lamina. 22 fr., 99 g.
Twenty-two fragments of iron lamina.
Dimensions: Max. pres. dim. of each: 44 x 22 x 4 mm, 22 x 21 x 3 mm, 63 x 40 x 4 mm, 46 x 37 x 5 mm, 36 x 36 x 5 mm, 18 x 16 x 4 mm, 50 x 23 x 2 mm, 38 x 28 x 2 mm, 20 x 15 x 3 mm, 37 x 29 x 4 mm, 23 x 23 x 3 mm, 22 x 20 x 2 mm, 23 x 19 x 2 mm, 47 x 34 x 3 mm, 11 x 9 x 4 mm, 23 x 18 x 3 m, 16 x 14 x 2 mm, 46 x 24 x 3 mm, 36 x 22 x 4 mm.
2012. SU 10003.

SF 310006. Iron lamina. 1 fr., 5 g.
Fragment of iron band; heavily oxidized, irregular form, slightly convex. Oxidized.
Dimensions: Max. pres. dim. 42 x 19 x 3 mm.
2012. SU 10003.

SF 310137. Iron lamina. 1 fr.
Flat, rectangular iron band, twisted around into an

S-shape. Iron nails driven through either end of the bar, one of which has a joining fragment. Oxidized.
Dimensions: l. (bent) 360 mm; l. (straight) ca. 700 mm; max. width 52 mm; max thickness 16 mm.
Nails: 1) L 65 mm, sec 8 x 7 mm to 7 x 6 mm; 2) 94 mm, sec 8 x 7 mm to 4 x 3 mm.
2012. SU 10085.

SF 311040. Iron lamina. 1 fr., 12 g.
Probable fragment of iron bar or band, heavily oxidized.
Dimensions: Max. pres. dim. 61 x 11 x 7 mm.
2012. SU 11048.

SF 311009. Lead lamina. 1 fr., 9 g.
Fragment of lead strip with exterior rib attached, slightly concave.
Dimensions: Max. pres. l. of rib 40 mm; max. pres. l. of strip 31 mm; max. width 5 mm.
2012. SU 11000.

SF 314081. Lead lamina. 1 fr., 8 g.
Thin, flat fragment of a subrectangular form, corroded.
Dimensions: 25 x 17 x 2 mm.
2013. SU 14041.

SF 314070. Lead lamina. 1 fr. 16 g.
Small, rectangular fragment of lead strip, folded over along the major axis.
Dimensions: 33 x 13 x 5 mm.
2013. SU 14036.

Nails

Nails made of both copper alloy and iron were recovered at multiple RPP sites, although copper alloy nails are exclusive to Marzuolo. The vast majority of nails had succumbed to various states of oxidation and fragmentation. For the sake of brevity, nails and their dimensions have been expressed in the following tables, grouped by material of manufacture. The headings in the tables refer to the following:

# Fragments = Count of fragmentary finds.
# Intact = Count of intact finds.
Weight = Weight (g).
Length (bent) = Length of nails which were bent or curving (if so bent).
Length (straight) = Length of nails, straight (reconstructed if bent, otherwise as is).
Section (1a) = Section dimension toward head (or terminal, if fragmentary) along y-axis.
Section (1b) = Section dimension toward head (or terminal, if fragmentary) along z-axis.
Section (2a) = Section dimension toward point (or terminal, if fragmentary) along y-axis.
Section (2b) = Section dimension toward point (or terminal, if fragmentary) along z-axis.
Head 1 = Head dimension along y-axis, if extant.
Head 2 = Head dimension along z-axis, if extant.
Head form 1 = Form of head, as either F (flat), D (domical).
Head form 2 = Form of head, as either C (circular, rounded, or ovoid) or R (rectangular), or (T) T-shaped.
Section Form = Form of section, either C (circular/ovoid) or R (rectangular).
Preservation = Level of preservation, I (at least both head and body present), H (only the head), or B (only a fragment of the body) preserved.

Iron nails: Appendix Table 19.6c

Copper alloy nails: Appendix Table 19.6d

Necklace Parts

SF 310105. Copper alloy necklace (?). 1 fr., 3 g.
Small copper alloy ringlet, perhaps part of a necklace.
Dimensions: Max. h. 10 mm; exterior dim. 12 x 10 mm; interior dim. 8 x 8 mm.
2012. SU 10025.

Needles

SF 311024. Copper alloy needle. 1 int., 1g.
Copper alloy needle with eye. Needle is bent and broken around the eye on one side.
Dimensions: l. (bent) 82 mm; l. (straight) 91 mm; section diam. (max.) 2 mm; l. of eye 7 mm.
2012. SU 11034.

Pins

These objects comprise straight shafts of copper alloy cord and were identified as pins. However, other attributions are possible, as Cool (2016:86–88) discusses in her section on long-handled implements, a class which some of these objects may belong to.

SF 301060. Copper alloy pin (?). 2 fr., 1 g.
Two joining fragments of a slightly tapering shaft of a pin with subcircular section, broken at both ends.
Dimensions: Max pres. l. 58 mm; max pres. diam. of section 25 mm.
2009. SU 1018.

SF 310506. Copper alloy pin (?). 1 fr., 3 g.
Small fragment of copper alloy pin, rounded at one terminal and broken at the other.
Dimensions: Max. pres. l. 29 mm, section from 3 mm to 2 mm.
2012. SU 10000.

SF 312012. Copper alloy pin (?). 1 fr., 1 g.
Fragment of copper alloy pin.
Dimensions: l. 48 mm, w. 2.5 mm.
2013. SF 12020.

Rings

Copper alloy and iron rings are a recurring find in many assemblages but, disassociated from other finds, their function is hard to deduce. Smaller ringlets could have been a part of a necklace or chain, while larger rings could have belonged to any from a bit for a horse or some sort of mechanical device, although Manning (1985:140) aptly notes that size is of little use in determining function.

SF 308004. Copper alloy ring. 1 int., 4 g.
Small copper alloy ring with circular section.
Dimensions: Max. diam. 21 mm; max. h. 5 mm; max. thickness 3 mm.
2011. SU 8007.

SF 310088. Copper alloy ring. 1 int., 3 g.
Copper alloy ring with ovoid section.
Dimensions: Major axis ext./int. dim.: 22/17 mm; minor axis ext./int. dim.: 20/16 mm; th. of section 3 mm.
2012. SU 10033.

SF 311018. Copper alloy ring. 1 int., 14 g.
Copper alloy ring, circular in shape with ovoid section.
Dimensions: Ext./int. diam. along major axis, 36/29 mm, along minor axis 35/26 mm.
2012. SU 11029.

SF 311033. Copper alloy ring. 1 int., 1 g.
Small copper alloy ring with flat section.
Dimensions: Ext./int. dim. along major axis: 17/15 mm; along minor axis 16/14 mm, section 2 x 1 mm.
2012. SU 11033.

SF 311058. Copper alloy ring. 1 int., 1 g.
Small copper ringlet with circular section.
Dimensions: 8 x 7 mm, with section 2 x 2 mm.
2012. SU 11012.

SF 311059. Copper alloy ring. 1 int., 7 g.
Copper ring with triangular section.
Dimensions: Ext./int. diam. 21/14 mm, thickness 6 mm.
2012. SU 11055.

SF 305027. Iron ring. 1 int., 7 g.
Large iron ring with circular section.
Dimensions: Max. diam. 62 mm, min. diam. 51 mm. Max. thickness 11 mm.
2010. SU 5014.

SF 310153. Iron ring. 1 int., 40 g.
Iron ring, intact save for small gap (break), oxidized. Circular section.
Dimensions: Ext./int. dim. along major axis 60/49 mm, along minor axis 60/46 mm.
2012. SU 10093.

SF 310510. Iron ring. 1 int., 22 g.
Iron ring, oxidized, with circular section.
Dimensions: Max. dim. 48 x 46 mm, section 11 mm.
2012. SU 10000.

SF 311011. Iron ring. 1 fr., 9 g.
Fragment of iron ring with subovoid section, slightly more than half preserved; heavily oxidized.
Dimensions: Max. pres. w. 43 mm; section max. 5 x 5

mm; section min. at terminal 5 x 3 mm.
2012. SU 11007.

SF 312018. Iron ring. 1 fr. 9 g.
Fragment of iron ring in curved 'C' shape with indeterminate section. Oxidized.
Dimensions: 34 x 27 x 8 mm.
2013. SU 12032.

Seal box

SF 312000. Copper alloy seal-box. 1 fr., 4 g.
While this type of object has in the past been interpreted as a pendant or *bulla*, it is in fact the lid of a seal-box (Derks and Roymans 2002:89–93; Andrews 2012). Piriform shaped copper alloy lid terminating in a circle, with a point (the hinge) projecting from the other end. Raised phallic decoration is located on the exterior, with a serrated border around the margin. The function of these objects has been associated with sealing a *stylus*-tablet (Crummy 1983:103; Derks and Roymans 2002), but their function can more convincingly be attributed to sealing a bag or pouch (Andrews 2013).
Dimensions: l. 32 mm, w. 18 mm, th. 1 mm.
Comparanda: Andrews 2013, Shape P2 Design D15; Derks and Roymans (2002:110, pl. 7.II, 3.20), from Vechten. cf. Portable Antiquities Scheme WMID-4220 (Bolton 2002) and HAMP-069741 (Webley 2011). Also identical to this object is one *bulla unguentaria* dated to the 2nd–3rd c. AD from Salona which was acquired in 1886 by the Split Archaeological Museum (Inv. no. AMS-H-1771), on which see Ivčević (1997:133, cat. n. 26, T. IV. 26) and Jovanović (2013, cat. n. 17, fig. 17). My thanks to Dr. Zrinka Buljević for providing this information.
Date: 2nd–3rd c. AD.
2013. SU 12001.

Shuttle Threads

SF 301015. Copper alloy shuttle thread. 1 int., 1 g.
Small oarlock-shaped copper alloy form, consisting of subround section with a stepped shaft issuing out from the midpoint which is subrectangular sectioned. Terminal of shaft is profiled. Appears broken at terminal; unconserved. Shuttles are diffuse throughout the Roman world from the first to 5th c. AD, and often had a longer stem. The example from Augst (ca. 35–100 AD) illustrates a similarly shortened shuttle. It is likely that these shuttles were inserted into a wooden stem.
Dimensions: Max. pres. h. 20 mm; max. w. 12 mm; max. w. of section of subround ring 3 mm; max. pres. l. of subrectangular shaft: max. pres. l 7 mm, section upper join 3 x 2 mm; at terminal.
2 x 1 mm.
Comparanda: Deschler-Erb (1999:159, no. 437, table 21). cf. Artifacts NVT-4001.
Date: 5th c. AD.
2009. SU 1023.

SF 301058. Copper alloy shuttle thread. 1 int., 10 g.
Small upsilon-shaped copper alloy object, likely shuttle thread that was affixed to a wooden or bone tang.
Dimensions: Max. pres. l. 33 mm, max. w. 17 mm.
Comparanda: cf. SF 301015.
Date: 5th c. AD.
2009. SU 1014.

Studs (Flat-Headed)

The category of stud was used for a small nail with a wide disc-shaped head and thin, short body. This form corresponds to the Manning Type 7 nail. Also see Crummy (1983:116–118).

SF 313005. Copper alloy stud. 1 int., 1 g.
Circular, flat disc with a small projection in the center on one side.
Dimensions: Diam. 10 mm. Pres. l. of projection 3 mm.
2013. SU 13002.

SF 314020. Copper alloy stud. 1 int., 1 g.
Circular, flat disc with a small projection in the center on one side.
Dimensions: Diam. 14 mm.
2013. SU 14008.

SF 314043. Copper alloy stud. 1 int., 1 g.
Circular, flat copper alloy disc with a small, slightly bent projection in the center on one side.
Dimensions: Diam. 12 mm.
2013. SU 14017.

SF 314085. Copper alloy stud. 1 int., 2 g.
Circular, flat copper alloy disc with a small, slightly bent projection in the center on one side.
Dimensions: Diam. 15 mm.
2013. SU 14032.

Swords

SF 314068. Iron sword (?). 1 fr., 29 g.
Fragment of iron tool, perhaps sword or knife point.
Dimensions: 79 x 79 x 29 mm, th. 9 mm tapering to 3 mm.
2013. SU 14034.

Tacks or Small Nails

Tacks were defined as small, short nails, regardless of the dimension of the head (either example below presents a domed or flat head). These objects were most likely used in upholstery work, according to Manning (1985:135).

SF 301001. Copper alloy tack. 1 int., 1 g.
Fine copper alloy nail with subspherical head with pointed apex. Section is circular. This find was originally classed as a "pin," but can more accurately be labeled as a small round-headed nail.
Dimensions: h. 5 mm, diam. 55 mm, and with subrectangular section, whose shaft tapers from 20 x 20 mm to slightly dull point, l. 16 mm. Total l. 21 mm.
Comparanda: Crummy (1983:115 no. 2995).
2009. SU 1001.

SF 305005. Copper alloy tack. 3 fr., 1 g.
Small copper alloy tack or stud, in three or four fragments. Tacks can be associated with the Manning Type 8 nail, which has a small, short stem and typically a domed head.
Dimensions: l. 6 mm (1 fr.) + 8 mm (1 fr.); width 2 mm; max pres. diam. of head 3.5 mm.
Comparanda: Manning (1985:135).
2010. SU 5001.

SF 312002. Copper alloy tack. 1 int., 1 g.
Small, copper alloy nail with circular head and square cross section, slightly curves at tip.
Dimensions: l. = 7 mm, section = 3 x 2 mm tapering slightly to 2 x 1 mm. Diam. of head = 7 mm.
2013. SU 12002.

Tweezers

SF 312005. Copper alloy tweezers. 1 int., 14 g.
Copper alloy tweezers, broad flat terminal, tapering to point with undecorated flat surface.
Dimensions: l. = 86 mm, w. = 13 mm tapering to 2 mm, th. = 3 mm tapering to 2 mm.
2013. SU 12004.

Vessel Handles

SF 301049. Copper alloy vessel handle. 1 int., 14 g.
Ducks-head-shaped copper alloy fragment, likely a finial or decorative thumb-rest on a vessel handle.
Dimensions: 54 x 12 x 10 mm.
2009. SU 3001.

SF 301055. Copper alloy vessel handle (?). 1 fr.. 30 g.
Possible fragment of handle of a copper alloy vessel. Interior surface is flat, with rounded convex section. Pronounced diagonal incision on outer surface.
Dimensions: max. pres. dim 42 x 18 x 7 mm.
2009. SU 1510.

SF 310131. Copper alloy vessel handle. 1 fr.
Fragment of the central portion of a copper alloy handle for a vessel; two additional extending arms attach to this fragment, which were originally included in the find of the copper alloy pitcher itself (SF 310144, SU 10085). The section of the handle is rounded, while the extending arms were grooved, which fit the rim of the pitcher. Such handles could be very ornate, decorated with anthropomorphic or theriomorphic devices on the thumb-rest. Spool-shaped thumb-rests are attested at Pompeii.
Dimensions: h. 89 mm, w. 55 mm; section at bottom 9 x 8 mm; section on extending arms 12 x 10 mm. Dim. of spool on top of the handle 20 x 19 mm in section.
Comparanda: cf. the thumb-rest handle on Tassinari (1993:133, no. 7060).
2012. SU 10080.

Vessel Lids

SF 310150. Copper alloy vessel lid (?). 1 fr., 18 g.
Thin fragment of copper alloy with slight grooving toward edge on one surface, likely a lid for a vessel or container. A nearly identical fragment, identified as a fragment of a bronze plate, comes from Room 4 of Pompeii I.10.8.
Dimensions: Max. pres. dim. 48 x 40 x 3 mm.
Comparanda: Allison (2006:218, cat. no. 1618, fig. 103.4).
2012. SU 10089.

Vessel Rim

SF 310144. Copper alloy vessel. 1 fr.
Large fragment of copper alloy fragment of large-mouthed pitcher (nearly intact). Body of the vessel in convex, with the neck of the vessel gently sloping outward, slightly thickening toward the rim. Exterior grooving is present on rim for handle attachment.
Dimensions: Rim diam. ca. 105 mm.
Comparanda: Tassinari (1993: C1221).
2012. SU 10080.

SF 317002. Copper alloy vessel rim. 1 fr., 10 g.
Curving fragment of copper alloy, folded inward along one margin. Probable fragment of vessel, whose rim is a retroflexive, flat, folded toward the interior of the vessel. Rim shape is gently sloping convex. Fragment probably belonged to either a pot (*caldaia*) or a situla.
Dimensions: Rim diam. ca. 192 mm.
Comparanda: It is difficult to find similar vessel rims of this fragment. Tassinari (1993) does not provide any immediate examples that would correspond with the interior-facing retroflexive rim or the slope of the rim.
2014. SU 17003.

Vessel Supports

SF 305015. Copper alloy vessel support. 1 fr., 1 g.
Small copper alloy vessel support. Form is curvilinear with two large perforations, smooth and undecorated on the interior but with vegetal or acanthus motif on the exterior.
Dimensions: Max. pres. l. 23 mm, max width 7 mm, max thickness 3 mm.
Comparanda: Feugère (2009:146–147, no. 594, fig. 42), Ruegg (1995:48, no. 3.174).
Date: ca. 30 BC–50 AD.
2010. SU 5014.

SF 311001. Copper alloy vessel support. 1 int., 23 g.
Copper alloy vessel support, triangular in form with gently curving or lunate margin and volute terminals. The example from Pompeii was interpreted as a support for a casserole, but the support could also have been used for a situla.
Dimensions: Max. thickness 5 mm; max. l. 57 mm; min. l. 5 mm; max. h. 25 mm.
Comparanda: Allison (2006:202, no. 1466, plate 95.6) = Tassinari (1993:144, G5285).
Date: 1st c. AD.
2012. SU 11000.

Unidentified Copper Alloy Objects

SF 308002. Copper alloy pin (?). 2 fr., 1 g.
Small piece of copper alloy pin fragment with circular cross section.
Dimensions: Max. l. 24 mm; section max. diam. 5 mm.
2011. SU 8001.

SF 311030. Copper alloy object, unidentified.
Small copper alloy object, cylindrical with split ends. Likely related to a toilette kit or some other instrument.
Dimensions: 21 x 4 x 4 mm.
2012. SU 11012.

SF 312010. Copper alloy pin (?). 1 fr., 1 g.
Fragment of copper alloy object. Originally identified as a pin, this object has a rectangular section which tapers to a rounded terminal.
Dimensions: l. 15 mm, section 3 x 3 mm tapering to 2 x 1 mm.
2013. SU 12020.

Unidentified Iron Tools

SF 301034. Iron tool (?). 1 fr., 75 g.
Fragment of iron bar, heavily oxidized. Given the

state of corrosion, it is not possible to provide an attribution to this artifact, although its dimensions would fit with any number of iron tools, such as a hammer, adze, chisel, or anvil.
Dimensions: 140 x 32 x 20 mm.
2009. SU 1506.

SF 301069. Iron tool (?). 1 fr., 18 g.
Fragment of iron bar, heavily oxidized. Given the state of corrosion, it is not possible to provide an attribution to this artifact, although its dimensions would fit with any number of iron tools, such as a hammer, adze, chisel, or anvil.
Dimensions: 127 x 35 x 21 mm.
Comparanda: cf. SF 301034.
2009. SU 1001.

Weights

SF 311053. Lead weight. 1 int., 225 g.
Flat, donut-shaped lead weight.
Dimensions: Exterior dim 62 x 58 mm, interior dim 13 x 12 mm, thickness 10 mm.
2012. SU 11000.

Worked Bone Objects

SF 514032. Bone dice. 1 int., 1 g.
Six-sided die, with numbers incised as dots each surface with circular incision around each point.
Dimensions: 8 x 8 x 7 mm.
Comparanda: Crummy 1983:96–97; Cool 2016:229–231.
2013. SU 14008.

SF 514047. Bone needle. 1 int., 1 g.
Bone needle, intact.
Dimensions: l. 96 mm, w. 5 mm tapering to 2 mm. Eye is 3 x 2 mm.
2013. SU 14025.

SF 514067. Bone needle. 1 fr., 1 g.
Possible fragment of bone needle with eye.
Dimensions: Max. pres. l. 17 mm, section 5 x 3 mm.
2013. SU 14034.

SF 511014. Bone pin. 1 fr., 1 g.
Fragment of worked bone, part of a pin or rod. Hollow at bottom.
Dimensions: l. 38 mm, max. diam. 8 mm tapering to 2 mm.
2012. SU 11043.

SF 514014. Bone pin. 1 fr., 1 g.
Fragment of worked bone pin.
Dimensions: l. 49 mm, w. 5 mm and tapers to 3 mm.
2013. SU 14006.

SF 514015. Bone pin. 1 fr., 2 g.
Fragment of worked bone pin.
Dimensions: l. 63 mm, w. 5 mm tapering to 3 mm.
2013. SU 14006.

SF 514016. Bone pin. 1 fr., 1 g.
Fragment of worked bone pin.
Dimensions: l. 63 mm, w. 3 mm tapering to 1 mm.
2013. SU 14006.

SF 514019. Bone pin. 1 fr., 1 g.
Fragment of worked bone pin.
Dimensions: l. 14 mm, w. 3 mm.
2013. SU 14008.

SF 514025. Bone pin. 1 fr., 1 g.
Fragment of worked bone pin.
Dimensions: l. 13 mm, w. 2 mm.
2013. SU 14008.

SF 514026. Bone pin. 1 fr., 1 g.
Fragment of worked bone pin.
Dimensions: l. 35 mm, w. 3 mm.
2013. SU 14011.

Gaming Tokens

SF 514020. Glass gaming token. 1 int., 2 g.
Small blue green glass gaming piece, ovoid or lenticular in shape and flat on the underside.
Dimensions: 17 x 11 x 4 mm.
Comparanda: Crummy 1983:92–93; Cool 2016:231–239.
2013. SU 14008.

Loomweights

SF 511005. Ceramic loomweight. 1 fr., 63 g.

One fragment of the top of a loomweight, with perforated hole running along main axes and plain upper surface. Color 10R 5/6.
Dimensions: Max pres dim 30 x 43 x 74 mm.
2012. SU 11043.

SF 512008. Ceramic loomweight. 2 fr., 563 g.
Terracotta loomweight with single hole along major axis, cross incision on superior surface. Color 7.5 YR 6/4.
Dimensions: 65 x 41 x 108 mm.
2013. SU 12030.

SF 512009. Ceramic loomweight. 2 fr., 593 g.
Two joining fragments of a loomweight, with perforated hole along main axis and cross incision on superior surface. Color 10 YR 7/1.
Dimensions: 63 x 45 x 114 mm.
2013. SU 12032.

SF 512010. Ceramic loomweight. 2 fr, 622 g.
Two joining fragments of a loomweight, with perforated hole along central axis, no incision on superior surface. Color 10 YR 6/3.
Dimensions: Max. pres. dim. 58 x 42 x 118 mm.
2013. SU 12032.

SF 518009. Ceramic loomweight. 1 fr., 509 g.
Fragment of lower part of loomweight. Broken at perforation, which runs through the long axis of the weight. Color 2.5 YR 7/4.
Dimensions: Max. pres. h. 76 mm, base 70 x 47 mm, max. pres. upper dim. 64 x 46 mm.
2014. SU 18002.

Marble Fragments

SF 505001. Marble plaque. 4 fr., 285 g.
Four joining fragments of marble slab with raised border. No relief decoration or paint visible.
Dimensions: Max. pres. dim. of combined fragments: 193 x 51 x 15 mm.
2010. SU 5014.

SF 505002. Marble fragment. 1 fr., 665 g.
Large cylindrical marble fragment, perhaps sculptural.
Dimensions: Max. pres. h. 77 mm, max. diam. 84 mm, min. diam. 75 mm.
2010. SU 5014.

Grinding Stones

SF 510033. Grinding stone. 1 int., 3121 g.
One large fragment of a stone, perhaps used for grinding.
Dimensions: Max. dim. 260 x 205 x 60 mm.
2012. SU 10033.

SF 512007. Grinding stone. 1 int., >5 kg.
Large stone used for possibly used for grinding, presents indentation on inferior surface, with drilled holes on exterior lateral edge. Cut marks appear on both sides of the surface of the stone.
Dimensions: Max. dim. 332 x 24 x 71 mm.
2013. SU 12014

SF 514010. Grinding stone (?). 1 int.
Stone accessed into small find collection, but its interpretation as a grinding stone seems unlikely.
2013. SU 14006.

Whetstones

SF 510219. Whetstone (?). 1 int., 2030 g.
Fragment of worked stone, worked into a rectangular form with a parabolic curve on one side. The interpretation of this object as a whetstone seems unlikely; it perhaps had an architectural function.
Dimensions: 160 x 114 x 50 mm.
2012. SU 10124.

SF 517003. Whetstone. 1 int., 306 g.
Possible whetstone, trapezoidal in shape, with mortar encrusted on one side. Several cut marks and chips are found on the surface and edges of the stone.
Dimensions: 145 x 47 x 23 mm.
2014. SU 17002.

Stone Peg

SF 511001. Stone peg. 1 int., 4 g.
Stone peg with triangular section and polygonal head.

Dimensions: l. 29 mm, section 9 x 8 x 6 mm tapering to point. Dim of head 17 x 13 mm.
2012. SU 11012.

Lithic Bifaces

SF 519001. Lithic scraper. 1 int., 14 g.
Stone scraper, rectangular in shape tapering to sharpened edges.
Dimensions: l. 50 mm; width 20 mm; thickness 8 mm.
2014. SU 19001.

SF 519019. Lithic scraper. 1 int., 40 g.
Stone scraper, irregular in shape tapering to sharpened edges.
Dimensions: l. 56 mm; width 43 mm, thickness 10 mm and tapers to 1 mm.
2014. SU 19011.

SF 519022. Lithic scraper. 1 int., 52 g.
Stone scraper, irregular in shape tapering to sharpened edges.
Dimensions: L. 63 mm; width 42 mm; thickness 19 mm and tapers to 1 mm.
2014. SU 19011.

SF 519024. Lithic scraper. 2 int., 44 g.
Two stone scrapers, (1) roughly rectangular in shape tapering to sharpened edges; (2) irregular in shape tapering to sharpened edges.
Dimensions: (1) l. 32 mm, width 23 mm, thickness 7 mm and tapers to 1 mm; (2) l. 54 mm; width 39 mm; thickness 14 mm and tapers to 1 mm.
2014. SU 19011.

Tesserae

SF 505900. Stone tessera. 1 int., 1 g.
Small white tessera.
Dimensions: 8 x 7 x 12 mm.
2010. SU 5023.

SF 510009. Stone tessera. 1 int., 1 g.
Small white tessera.
Dimensions: 7 x 6 x 3 mm.
2012. SU 10000.

SF 510010. Stone tessera. 1 int., 1 g.
Small black and white veined stone.
Dimensions: 9 x 7 x 4 mm.
2012. SU 10000.

SF 510011. Stone tessera. 1 int., 9 g.
White tessera.
Dimensions: 14 x 10 x 29 mm.
2012. SU 10000.

SF 510012. Stone tessera. 1 int., 12 g.
White tessera, mortar attached.
Dimensions: 15 x 10 x 37 mm.
2012. SU 10000.

SF 510013. Stone tessera. 1 int., 3 g.
Grey tessera with mortar attached.
Dimensions: 14 x 13 x 30 mm.
2012. SU 10000.

SF 510014. Stone tessera. 1 int., 5 g.
Grey polygonal tessera.
Dimensions: 20 x 11 x 15 mm.
2012. SU 10000.

SF 510015. Stone tessera. 7 int., 75 g.
Multiple stone tesserae, light grey or white in various sizes, some with mortar attached.
2012. SU 10000.

SF 510016. Stone tessera. 1 int., 8 g.
Grey tessera with mortar attached.
Dimensions: 14 x 13 x 30 mm.
2012. SU 10026.

SF 510039. Stone tessera. 1 int., 2 g.
Stone tessera with some mortar attached.
Dimensions: 10 x 7 x 18 mm.
2012. SU 10036.

SF 510048. Stone tessera. 1 int., 9 g.
One stone tessera.
Dimensions: 14 x 10 x 35 mm.
2012. SU 10000.

SF 511003. Stone tessera. 1 int., 3 g.
Grey stone tessera with mortar attached.
Dimensions: 9 x 7 x 21 mm.
2012. SU 11029.

SF 516003. Stone tessera (?). 4 int., 34 g.
Possible tesserae, black in color.
Dimensions: 17 x 16 x 22 mm, 19 x 17 x 17 mm, 21 x 7 x 32 mm, 7 x 7 x 27 mm.
2014. SU 16001.

SF 518002. Stone tessera. 7 int., 75 g.
Seven tesserae, grey (4), white/multicolor (1), black (2).
Dimensions: grey: 25 x 9 x 35 mm ; 12 x 7 x 34 mm ; 10 x 10 x 23 mm ; 7 x 16 x 26 mm ; white: 13 x 14 x 35 mm ; black: 23 x 18 x 25 mm ; 20 x 6 x 30 mm.
2014. SU 18001.

SF 518003. Stone tessera. 1 int., 31 g.
Stone tessera, grey in color.
Dimensions: 14 x 24 x 32 mm.
2014. SU 18002.

Miscellaneous Special Finds

SF 517009. Terracotta mold. 2 fr., 652 g.
Two joining fragments of half of a ceramic mold for the manufacture of miniature terracotta *ex voto* sculpture, in the shape of an infant male head. The mold ends at the neck, which has a bulla tied around it, and is fragmentary towards the top, at the forehead and right eye. It is not possible to say whether this mold was used to impress the head on a two-dimensional *ex voto*, or whether there was an accompanying mold for the rear of the head for producing a sculpture in the round. Color 2.5 YR 5/4.
Dimensions: 149 x 127 x 68 mm.
Date: 3rd–1st c. BC, by style.
2014. SU 17002.

SF 517014. Stamped tile. 1 int.
Large fragment of pan tile with stamp in Etruscan. Stamp is rectangular, script retrograde, šp. l. ciart. See Collins-Elliott and Bowes 2016. Color 10 R 6/6.
Dimensions: 640 x 475 x 40 mm.
2014. SU 17019.

Table 19.6b Small Find Counts by Site

Material	Object	PI	SM	CN	PA	CM	PT	MZ	TB
Iron	Anvil	—	—	—	—	—	—	4	—
Copper Alloy	Appliqué	—	—	—	—	—	—	1	—
Copper Alloy	Awl	1	—	—	—	—	—	—	—
Iron	Awl	—	—	—	—	—	—	1	—
Lithic	Biface	—	—	—	—	—	—	—	5
Copper Alloy	Binding	—	—	1	—	—	—	1	—
Copper Alloy	Button	—	—	3	—	—	—	—	—
Copper Alloy	Chain	—	—	—	—	—	5	1	—
Iron	Collar	1	—	1	—	—	—	—	—
Copper Alloy	Cord	—	—	—	—	—	1	—	—
Iron	Cord	—	—	—	—	—	—	8	—
Glass	Counter	—	—	—	—	—	—	1	—
Copper Alloy	Decoration	—	—	—	—	—	—	4	—
Bone	Dice	—	—	—	—	—	—	1	—
Iron	Door Bolt	—	—	—	—	—	—	1	—
Copper Alloy	Double Rings	2	—	—	—	—	—	—	—
Copper Alloy	Dress Pin	—	—	—	—	1	—	3	—
Copper Alloy	Fibula	—	—	—	—	—	3	—	—
Copper Alloy	Finger Ring	—	—	—	—	—	—	1	—
Lead	Flow	—	2	5	—	—	—	5	—
Lithic	Grinding Stone	—	—	—	—	—	—	4	—
Copper Alloy	Harness Button	2	—	—	—	—	—	—	—
Copper Alloy	Harness Junction	1	—	—	—	—	—	—	—
Copper Alloy	Harness Mount	—	—	3	—	—	—	—	—
Copper Alloy	Harness Pendant	—	—	3	—	—	—	—	—
Iron	Hematite	—	—	—	—	—	—	2	—
Iron	Hinge	—	—	4	—	—	—	—	—
Iron	Hook	1	—	—	—	—	—	1	—
Copper Alloy	Knob	—	—	—	—	—	—	1	—
Copper Alloy	Lamina	1	—	39	—	—	—	1	1
Iron	Lamina	—	—	29	—	—	—	6	—
Lead	Lamina	—	—	—	—	—	—	3	—
Copper Alloy	Lock Bolt	—	—	—	—	—	—	1	—
Ceramic	Loomweight	—	1	—	—	1	—	6	1
Marble	Plaque	—	—	4	—	—	—	—	—
Lithic	Millstone	—	—	1	—	—	—	—	—
Lithic	Mortar	—	—	—	13	—	—	—	—
Copper Alloy	Nail	—	—	—	—	—	—	8	—

Table 19.6b cont'd Small Find Counts by Site

Material	Object	PI	SM	CN	PA	CM	PT	MZ	TB
Iron	Nail	54	3	47	1	—	3	242	14
Copper Alloy	Necklace	—	—	—	—	—	—	1	—
Bone	Needle	—	—	—	—	—	—	2	—
Copper Alloy	Needle	—	—	—	—	—	—	1	—
Lithic	Peg	—	—	—	—	—	—	1	—
Bone	Pin	—	—	—	—	—	—	9	—
Copper Alloy	Pin	2	—	—	—	—	1	3	—
Bone	Pivot	—	—	—	—	—	—	1	—
Copper Alloy	Ring	—	—	—	—	—	1	5	—
Iron	Ring	—	—	1	—	—	—	4	—
Marble	Sculptural	—	—	1	—	—	—	—	—
Copper Alloy	Seal Box	—	—	—	—	—	—	1	—
Copper Alloy	Shuttle Thread	2	—	—	—	—	—	—	—
Iron	Slag	20	—	24	—	—	—	30	16
Non ID	Slag	—	—	—	—	—	—	259	4
Ceramic	Spacer	—	—	—	—	—	—	—	1
Copper Alloy	Stud	—	—	—	—	—	—	4	—
Iron	Sword	—	—	—	—	—	—	1	—
Copper Alloy	Tack	1	—	4	—	—	—	1	—
Lithic	Tessera	—	—	1	—	—	—	17	12
Ceramic	Tile Stamp	—	—	—	—	—	—	—	1
Iron	Tool	2	—	—	—	—	—	—	—
Copper Alloy	Tweezers	—	—	—	—	—	—	1	—
Copper Alloy	Vessel Handle	2	—	—	—	—	—	1	—
Copper Alloy	Vessel Lid	—	—	—	—	—	—	1	—
Copper Alloy	Vessel Rim	—	—	—	—	—	—	1	1
Copper Alloy	Vessel Support	—	—	1	—	—	—	1	—
Ceramic	Votive Mold	—	—	—	—	—	—	—	2
Ceramic	Waster	—	—	—	—	—	—	5	27
Lead	Weight	—	—	—	—	—	—	1	—
Lithic	Weight	—	—	—	—	—	—	2	2
Lithic	Whetstone	—	—	—	—	—	—	1	1
Copper Alloy	Non ID	5	—	12	—	—	4	15	—
Iron	Non ID	6	—	13	—	—	—	4	—
Lead	Non ID	1	—	—	—	—	—	—	—
Metal	Non ID	—	—	—	—	—	—	—	6
Iron	Modern	—	—	—	—	—	—	4	2
Total		**104**	**6**	**197**	**14**	**2**	**18**	**684**	**96**

Table 19.6c Iron Nail Dimensions

Context (SU)	Material	Definition	# Fragments	# Intact	Weight	MNI	SF #	Length (bent)	Length (straight)	Section (1a)
1018	Iron	Nail	2	0	20	1	301002		90	16
1030	Iron	Nail	0	1	35	1	301003		105	13
1030	Iron	Nail	3	0	14	1	301004		25	6
1030	Iron	Nail	0	0	0	0	301004		38	6
1030	Iron	Nail	0	0	0	0	301004		38	6
1030	Iron	Nail	1	0	16	1	301007		21	
2003	Iron	Nail	2	0	2	1	301009		98	
2003	Iron	Nail	2	0	40	1	301011		153	20.5
1030	Iron	Nail	1	0	23	1	301012		55	
1030	Iron	Nail	0	1	16	1	301013		60	8
1029	Iron	Nail	3	0	26	1	301016		43	
1014	Iron	Nail	1	0	15	1	301020		59	
1018	Iron	Nail	1	0	8	1	301022		52	
1014	Iron	Nail	1	0	14	1	301023		29	7
1019	Iron	Nail	0	1	14	1	301024		82	
1019	Iron	Nail	1	0	12	1	301025		49	
1535	Iron	Nail	4	0	12	1	301026		38	
1501	Iron	Nail	0	1	11	1	301027	66.5	76	
1535	Iron	Nail	4	0	7	1	301028		5	
1535	Iron	Nail	0	1	7	1	301029			
1535	Iron	Nail	1	0	9	1	301030		54	
1023	Iron	Nail	0	0	5	1	301031			
1538	Iron	Nail	0	1	5	1	301032	124	129	18
1006	Iron	Nail	1	0	14	1	301035			
1006	Iron	Nail	0	1	13	1	301037			
1014	Iron	Nail	1	0	6	1	301042		33	15
1531	Iron	Nail	0	1	15	1	301044	55		10
1512	Iron	Nail	2	0	10	1	301046			
1530	Iron	Nail	2	0	15	1	301048			
1545	Iron	Nail	1	0	22	1	301053		60	14
1521	Iron	Nail	1	0	9	1	301054			
1018	Iron	Nail	1	0	9	1	301061			
1545	Iron	Nail	1	0	14	1	301062			
1018	Iron	Nail	2	0	21	1	301063			
1007	Iron	Nail	1	0	20	1	301065			
1019	Iron	Nail	1	0	13	1	301066			
1019	Iron	Nail	1	0	24	1	301067			
1007	Iron	Nail	1	0	21	1	301070			
1529	Iron	Nail	3	0	15	1	301071		27	9
1529	Iron	Nail	0				301071	31	40	7

	Section (1b)	Section (2a)	Section (2b)	Head 1	Head 2	Head form 1	Head form 2	Section form	Preservation
	10	7	6	19	19	F	T	R	I
	13	10	10	5	5	F	C	R	I
	4								
	4								
	4								
				36	28				
		8	7	49	49				
	16			23	23				
		9	8	25	25				
	7	6	6						
		6	5						
		7	5						
		6	5						
	6			22	22				
				20	20				
		8	7	17	17				
		15	13	15	14				
				19	17				
				12	11				
		6	5						
	14	7	5						
	13								
	10	9	7	19	18				
	13	7	7						
	7	8	5						
	7	5	2						

Table 19.6c cont'd Iron Nail Dimensions

Context (SU)	Material	Definition	# Fragments	# Intact	Weight	MNI	SF #	Length (bent)	Length (straight)	Section (1a)
1529	Iron	Nail					301071		20	5
4000	Iron	Nail	0	1	19	1	304001		87	10
4002	Iron	Nail	1	0	8	1	304002		50	6
4024	Iron	Nail	1	0	3	1	304003		21	6
5009	Iron	Nail	1	0	12	1	305001		41	7
5001	Iron	Nail	1	0	1	1	305007		21	6
5001	Iron	Nail	1	0	5	1	305009		37	6
5012	Iron	Nail	4	0	21	1	305010		66	5
5014	Iron	Nail	0	1	31	1	305016		75	8
5008	Iron	Nail	0	1	23	1	305017		87	16
5008	Iron	Nail	1	0	11	1	305023		55	7
5011	Iron	Nail	1	0	10	1	305028		36	8
5014	Iron	Nail	1	0	16	1	305034		50	9
5014	Iron	Nail	1	0	2	1	305035		25	7
5014	Iron	Nail	1	0	6	1	305036			
5014	Iron	Nail	1	0	3	1	305037		23	6
5014	Iron	Nail	2	0	17	1	305040		57	17
5022	Iron	Nail	1	0	14	1	305044		67	9
5022	Iron	Nail	1	0	9	1	305045		35	8
5022	Iron	Nail	1	0	17	1	305046		54	9
5025	Iron	Nail	1	0	44	1	305050		74	9
5014	Iron	Nail	1	0	8	1	305057		48	7
5014	Iron	Nail	1	0	2	1	305058		29	8
5036	Iron	Nail	1	0	25	1	305060		52	8
5014	Iron	Nail	1	0	15	1	305062		36	8
5014	Iron	Nail	1	0	13	1	305063		34	7
5014	Iron	Nail	1	0	8	1	305064		40	6
5014	Iron	Nail	1	0	5	1	305065		36	9
5014	Iron	Nail	0	1	24	1	305066		17	14
5014	Iron	Nail	1	0	8	1	305067		67	12
5030	Iron	Nail	1	0	9	1	305071		46	6
5028	Iron	Nail	1	0	20	1	305072		76	11
5025	Iron	Nail	1	0	29	1	305074		66	7
5014	Iron	Nail	1	0	14	1	305077		61	9
5048	Iron	Nail	0	1	19	1	305078		57	8
5023	Iron	Nail	1	0	13	1	305079		37	8
5048	Iron	Nail	0	1	6	1	305082		81	4
5023	Iron	Nail	10	0	21	3	305084			
5023	Iron	Nail					305084			
5023	Iron	Nail					305084			

	Section (1b)	Section (2a)	Section (2b)	Head 1	Head 2	Head form 1	Head form 2	Section form	Preservation
	3	5	2						
	9	6	6						
	6								
	6								
	7								
	4								
	6								
	5			20	20				
	8			20	20				
	16								
	7			14	14				
	8			19	19				
	9			18	18				
	7								
	6								
	17			35	35				
	9								
	8								
	9								
	9								
	7								
	8								
	8			20	20				
	8			25	25				
	7			23	23				
	6								
	9								
	12	8	7	24	24				
	15								
	6			13	13				
	6								
	7			18	18				
	9			18	18				
	8			19	19				
	8			20	20				
	4			8	8				

Table 19.6c cont'd Iron Nail Dimensions

Context (SU)	Material	Definition	# Fragments	# Intact	Weight	MNI	SF #	Length (bent)	Length (straight)	Section (1a)
5023	Iron	Nail					305084			
5023	Iron	Nail					305084			
5023	Iron	Nail					305084			
5023	Iron	Nail					305084			
5023	Iron	Nail					305084			
5023	Iron	Nail					305084			
6005	Iron	Nail	1	0	5	1	306001		32	7
8007	Iron	Nail	1	0	7	1	308005		39	7
8026	Iron	Nail	2	0	6	1	308006		35	7
10000	Iron	Nail	0	1	51	1	310001	92	113	
10000	Iron	Nail	1	0	6	1	310002	43	52	5
10000	Iron	Nail	0	1	10	1	310003		73	6
10001	Iron	Nail	0	1	34	1	310005	101	101	10
10025	Iron	Nail	0	1	41	1	310011		109	11
10025	Iron	Nail	1	0	11	1	310012	85	90	6
10016	Iron	Nail	0	1	39	1	310016		114	14
10017	Iron	Nail	0	1	37	1	310017		99	12
10016	Iron	Nail	0	1	25	1	310018		75	12
10016	Iron	Nail	1	0	29	1	310019		73	13
10016	Iron	Nail	1	0	30	1	310020		74	11
10016	Iron	Nail	1	0	14	1	310021		77	11
10000	Iron	Nail	1	0	23	1	310022		53	14
10000	Iron	Nail	0	1	41	1	310027	125	137	10
10000	Iron	Nail	0	1	43	1	310028		108	24
10034	Iron	Nail	0	1	52	1	310030		163	12
10023	Iron	Nail	0	1	40	1	310031	95	123	10
10000	Iron	Nail	1	0	2	1	310033		35	6
10033	Iron	Nail	0	1	41	1	310037		102	12
10023	Iron	Nail	1	0	17	1	310039		57	8
10055	Iron	Nail	2	0	5	2	310040		56	10
10055	Iron	Nail	0				310040		25	4
10055	Iron	Nail	0	1	27	1	310041		95	8
10055	Iron	Nail	1	0	22	1	310042		63	9
10055	Iron	Nail	0	1	53	1	310043		113	13
10000	Iron	Nail	1	0	9	1	310045		45	6
10033	Iron	Nail	0	1	50	1	310049		97	19
10033	Iron	Nail	0	1	37	1	310050		100	13
10033	Iron	Nail	1	0	7	1	310051		41	9
10033	Iron	Nail	1	0	43	1	310052		70	13
10033	Iron	Nail	1	0	15	1	310053		53	13

	Section (1b)	Section (2a)	Section (2b)	Head 1	Head 2	Head form 1	Head form 2	Section form	Preservation
	6								
	7								
	7								
		7	9	22	24				
	5	4	3						
	5	3	3	15	11				
	9	5	2	19	15				
	10	3	2	28	20				
	5								
	11	2	2	26	23				
	12	2	2	22	15				
	10	5	4	23	22				
	10	5	3	27	20				
	10	7	5	23	22				
	10	4	4						
	11	9	8	19	17				
	10	5	3	22	19				
	23	5	3	23	23				
	12	2	2	28	25	F	C	R	I
	9	5	4	30	24	F	C	R	I
	5								
	10	7	6	28	26				
	6	8	6					R	B
	8	6	5					R	B
	4	3	3					R	B
	6	4	3	20	19	F	C	R	I
	2	7	5	25	18	F	C	R	I
	12	8	7	25	22	F	C	R	I
	6	6	3	14	13				
	15	6	5	30	28				
	12	6	6	25	17				
	8	3	2						
	8	9	7	38	35				
	7	14	8						

Table 19.6c cont'd Iron Nail Dimensions

Context (SU)	Material	Definition	# Fragments	# Intact	Weight	MNI	SF #	Length (bent)	Length (straight)	Section (1a)
10033	Iron	Nail	1	0	3	1	310054		60	6
10033	Iron	Nail	0	1	23	1	310055		92	14
10033	Iron	Nail	2	0	26	1	310058		87	19
10033	Iron	Nail	1	0	1	1	310059		22	7
10033	Iron	Nail	0	1	3	1	310060	104	129	10
10033	Iron	Nail	0	1	32	1	310061	90	109	10
10033	Iron	Nail	0	1	46	1	310065	126	166	17
10033	Iron	Nail	0	1	31	1	310066	81	91	10
10033	Iron	Nail	0	1	39	1	310067	76	96	8
10033	Iron	Nail	1	0	15	1	310068		60	6
10033	Iron	Nail	1	0	8	1	310069		80	9
10033	Iron	Nail	0	1	39	1	310070	134	140	13
10033	Iron	Nail	0	1	56	1	310072	125	157	8
10023	Iron	Nail	0	1	50	1	310073	106	132	9
10033	Iron	Nail	0	1	31	1	310075		82	10
10033	Iron	Nail	0	1	51	1	310077	130	160	10
10033	Iron	Nail	0	1	16	1	310078		85	9
10033	Iron	Nail	0	1	50	1	310079	78	90	10
10033	Iron	Nail	1	0	16	1	310080		57	7
10033	Iron	Nail	0	1	12	1	310081		55	10
10033	Iron	Nail	0	1	52	1	310082	95	164	10
10033	Iron	Nail	0	1	12	1	310083		75	8
10033	Iron	Nail	0	1	10	1	310084		28	6
10033	Iron	Nail	0	1	24	1	310085	70	110	7
10033	Iron	Nail	1	0	46	1	310086	79	85	10
10033	Iron	Nail	1	0	15	1	310087		83	13
10033	Iron	Nail	1	0	7	1	310091		52	6
10033	Iron	Nail	1	0	8	1	310092		63	7
10033	Iron	Nail	0	1	55	1	310093		115	14
10033	Iron	Nail	1	0	22	1	310094		48	13
10033	Iron	Nail	0	1	25	1	310095		60	12
10033	Iron	Nail	1	0	14	1	310096		51	12
10033	Iron	Nail	0	1	40	1	310097		113	14
10033	Iron	Nail	0	1	38	1	310098		55	15
10033	Iron	Nail	0	1	48	1	310099		113	12
10033	Iron	Nail	0	1	33	1	310100	68	90	12
10033	Iron	Nail	0	1	32	1	310101		79	12
10000	Iron	Nail	0	1	16	1	310102	56	61	10
10016	Iron	Nail	0	1	39	1	310103		80	12
10066	Iron	Nail	2	0	20	1	310106		43	7

Section (1b)	Section (2a)	Section (2b)	Head 1	Head 2	Head form 1	Head form 2	Section form	Preservation
3	3	1						
13	7	6	17	17				
4	9	6						
3								
6			18	11				
8	3	3	19	17				
17	3	3	31	30				
9	4	3	20	17				
7	5	5	21	18				
5	5	3						
8	3	1						
12	3	3	22	20				
7	6	5	36	31				
8	3	3	37	33	F	C	R	B
10	6	4	21	20				
8	3	2	35	30				
7	2	2	23	9				
7	2	2	38	37				
6	9	6	26	17				
7	6	5	20	9				
6	5	4	34	33				
8	2	2	18	13				
5	3	1	18	5				
7	3	1	20	18				
9	5	3	34	33				
7			9	6				
5	3	2						
6	3	2						
12	7	6	35	25				
11	7	3	27	23				
11	6	6	29	21				
7	6	5						
12	7	5	24	22				
12	11	9	32	31				
7	6	2	24	22				
11	11	7	32	22				
11	3	2	26	23				
7	2	1	12	11				
8	3	2	28	21				
6	6	5						

Table 19.6c cont'd Iron Nail Dimensions

Context (SU)	Material	Definition	# Fragments	# Intact	Weight	MNI	SF #	Length (bent)	Length (straight)	Section (1a)
10066	Iron	Nail	0				301106		46	8
10071	Iron	Nail	1	0	25	1	310107			
10033	Iron	Nail	0	1	27	1	310108		117	8
10065	Iron	Nail	0	1	32	1	310109	103	103	12
10033	Iron	Nail	0	1	22	1	310110		115	7
10033	Iron	Nail	0	1	29	1	310111		100	10
10033	Iron	Nail	0	1	25	1	310113		103	10
10033	Iron	Nail	1	0	16	1	310114		57	9
10033	Iron	Nail	0	1	19	1	310115		84	9
10023	Iron	Nail	1	0	28	1	310116		16	
10055	Iron	Nail	0	1	21	1	310117		48	14
10059	Iron	Nail	0	1	14	1	310118	84	84	9
10059	Iron	Nail	1	0	13	1	310119	68	76	9
10059	Iron	Nail	0	1	27	1	310120		120	9
10059	Iron	Nail	1	0	14	1	310121		70	14
10059	Iron	Nail	0	1	13	1	310122		68	11
10059	Iron	Nail	1	0	26	1	310123		103	14
10035	Iron	Nail	1	1	18	1	310124		93	10
10035	Iron	Nail	0	1	30	1	310125		53	9
10000	Iron	Nail	2	0	31	1	310126		53	11
10055	Iron	Nail	0	1	17	1	310128		51	9
10055	Iron	Nail	0	1	39	1	310130	107	110	13
10023	Iron	Nail	1	0	6	1	310132		45	8
10023	Iron	Nail	1	0	2	1	310133			
10023	Iron	Nail	0	1	26	1	310135		77	9
10085	Iron	Nail	0	1	26	1	310138	63	80	8
10085	Iron	Nail	0	1	28	1	310139		90	9
10085	Iron	Nail	0	1	144	1	310140		228	17
10085	Iron	Nail	0	1	63	1	310141		105	15
10085	Iron	Nail	0	1	35	1	310142	107	110	11
10080	Iron	Nail	0	1	60	1	310151	145	155	13
10080	Iron	Nail	0	1	47	1	310152	114	116	8
10000	Iron	Nail	2	4	182	5	310154	80	172	8
10000	Iron	Nail					310154	77	141	8
10000	Iron	Nail					310154	123	140	8
10000	Iron	Nail					310154		40	10
10000	Iron	Nail					310154	57	82	10
10000	Iron	Nail					310154	65	68	5
10023	Iron	Nail	4	2	146	5	310155	105	113	10
10023	Iron	Nail					310155	75	129	19

	Section (1b)	Section (2a)	Section (2b)	Head 1	Head 2	Head form 1	Head form 2	Section form	Preservation
	7	4	3	17	15				
	5	3	2	20	9				
	11	6	5	22	20	F	C	R	I
	5	2	2	21	2				
	10	6	5	22	20				
	8	5	4	21	20				
	7	7	6						
	8	4	3	19	18				
				33	33	D	C		H
	14	10	9	21	18	D	C	R	I
	6	3	2	20.5	8	F	T	R	I
	6	6	3					R	B
	7	5	3	26	8	F	T		I
	8	6	5					R	B
	8	7	5	19	8	F	T	R	I
	13	6	5					R	B
	9	7	6	20	17				
	6	8	8	26	25				
	10	9	7	40	35				
	8	9	8	24	17	F	C	R	I
	11	3	3	23	31	F	R	R	I
	5	3	3					R	B
	7	7	5	24	20	F	C	R	I
	7	7	6	22	21	C	D	R	I
	6	5	4	22	20	C	D	R	I
	16	3	3	32	30	C	D	R	I
	13	5	4	27	26	F	R	R	I
	9	4	3	19	19	F	R	R	I
	13	3	2	25	22				
	7	6	5	25	24				
	7	4	3	29	27				
	7	6	5	20	15				
	7	3	3	26	23				
	8	11	7	28	27				
	9	5	3						
	5	4	3	10	10				
	9	3	2	25	24				
	18	4	3	27	25				

Table 19.6c cont'd Iron Nail Dimensions

Context (SU)	Material	Definition	# Fragments	# Intact	Weight	MNI	SF #	Length (bent)	Length (straight)	Section (1a)
10023	Iron	Nail					310155	80	110	12
10023	Iron	Nail					310155	66	85	
10023	Iron	Nail					310155	49	62	5
10023	Iron	Nail					310155		30	7
10082	Iron	Nail	2	0	14	1	310156	59	75	8
10082	Iron	Nail					310156		4	7
10071	Iron	Nail	2	1	44	2	310157	86	86	8
10071	Iron	Nail					310157	35	35	14
10071	Iron	Nail					310157	35	35	7
10023	Iron	Nail	1	3	131	4	310158		112	13
10023	Iron	Nail					310158		85	12
10023	Iron	Nail					310158		73	11
10023	Iron	Nail					310158		26	5
10093	Iron	Nail	1	1	60	2	310160	100	115	6
10093	Iron	Nail					310160	74	74	11
10035	Iron	Nail	3	10	518	12	310161		120	8
10035	Iron	Nail					310161		132	16
10035	Iron	Nail					310161		117	7
10035	Iron	Nail					310161		118	10
10035	Iron	Nail					310161		127	11
10035	Iron	Nail					310161		112	8
10035	Iron	Nail					310161		98	11
10035	Iron	Nail					310161		113	11
10035	Iron	Nail					310161		127	8
10035	Iron	Nail					310161		140	12
10035	Iron	Nail					310161		66	12
10035	Iron	Nail					310161		75	8
10035	Iron	Nail					310161		16	7
10059	Iron	Nail	22	0	127	6	310162		50	7
10059	Iron	Nail					310162		50	8
10059	Iron	Nail					310162		41	6
10059	Iron	Nail					310162		36	6
10059	Iron	Nail					310162		34	6
10059	Iron	Nail					310162		26	7
10059	Iron	Nail					310162		28	7
10059	Iron	Nail					310162		23	4
10059	Iron	Nail					310162		37	7
10059	Iron	Nail					310162	34	38	7
10059	Iron	Nail					310162	29	41	5
10059	Iron	Nail					310162		42	17

	Section (1b)	Section (2a)	Section (2b)	Head 1	Head 2	Head form 1	Head form 2	Section form	Preservation
	8	5	2	31	23				
	4	3	2						
	5	6	5						
	6	6	5						
	6	2	2	12	10				
	6	5	5						
	11	5	5	27	24				
	6	7	6						
	12	3	1	26	25				
	10	8	7	27	26				
	10	5	5	25	15				
	3	7	3						
	6	5	4	20	21				
	7	7	5	27	25				
	7	3	1	26	23				
	13	5	5	26	25				
	6	5	2	19	17				
	9	5	5	20	20				
	7	5	5	28	23				
	7	4	3	27	25				
	9	6	5	22	17				
	8	7	6	24	23				
	7	3	2	27	25				
	10	4	4	26	23				
	8	6	5	27	25				
	7	5	4						
	7	7	7	30	29				
	6	5	3						
	6	6	5						
	5	6	6						
	5	3	2						
	5	8	7						
	6	6	6						
	6	5	2						
	4	3	2						
	5	5	3						
	5	4	3						
	5	4	4						
	12	7	5						

Table 19.6c cont'd Iron Nail Dimensions

Context (SU)	Material	Definition	# Fragments	# Intact	Weight	MNI	SF #	Length (bent)	Length (straight)	Section (1a)
10059	Iron	Nail					310162		24	5
10059	Iron	Nail					310162		23	9
10059	Iron	Nail					310162		9	8
10059	Iron	Nail					310162		34	13
10059	Iron	Nail					310162		23	12
10059	Iron	Nail	1	0	67	1	310164	149	185	9
10085	Iron	Nail	2	0	66	2	310166	119	125	20
10085	Iron	Nail					310166	107	113	8
10107	Iron	Nail	0	1	25	1	310200		74	10
10107	Iron	Nail	0	1	20	1	310201		85	5
10107	Iron	Nail	0	1	33	1	310202		88	8
10107	Iron	Nail	0	1	21	1	310203		98	6
10110	Iron	Nail	0	1	13	1	310204	80	87	6
10110	Iron	Nail	0	1	14	1	310205	50	90	7
10110	Iron	Nail	1	0	26	1	310206	40	110	14
10045	Iron	Nail	1	0	5	1	310210		37	7
10109	Iron	Nail	1	0	3	1	310220		30	7
10059	Iron	Nail	1	0	16	1	310500		68	7
10059	Iron	Nail	2	0	33	1	310501		45	11
10084	Iron	Nail	1	0	11	1	310503		51	16
10084	Iron	Nail	1	0	28	1	310504		52	20
10084	Iron	Nail	1	0	15	1	310505		43	10
10085	Iron	Nail	0	1	54	1	310507		114	18
10085	Iron	Nail	1	0	57	1	310508	84	99	24
10085	Iron	Nail	1	0	30	1	310509	70	70	10
10000	Iron	Nail	0	1	11	1	310511		49	5
10071	Iron	Nail	2	0	4	1	310515		17	17
10055	Iron	Nail	2	0	4	2	310516			
10055	Iron	Nail					310516			
11000	Iron	Nail	0	1	17	1	311002	100	132	5
11000	Iron	Nail	0	1	18	1	311003		53	10
11000	Iron	Nail	0	1	11	1	311004		31	8
11000	Iron	Nail	1	0	16	1	311005		43	20
11000	Iron	Nail	2	0	4	1	311006		31	4
11000	Iron	Nail	0				311006		31	3
11007	Iron	Nail	0	1	4	1	311012		20	4
11005	Iron	Nail	1	0	17	1	311013		66	8
11005	Iron	Nail	0	1	29	1	311015		69	9
11016	Iron	Nail	0	1	23	1	311016		47	6
11000	Iron	Nail	0	1	23	1	311019		54	9

	Section (1b)	Section (2a)	Section (2b)	Head 1	Head 2	Head form 1	Head form 2	Section form	Preservation
	5	5	4						
	8	10	4	23	22				
	7	8	7	23	22				
	11	6	5	36	34				
	11	8	7	25	25				
	9	5	5	40	37				
	16	2	2	20	18				
	7	3	3	23	20				
	8	8	6	20	18				
	5	5	5	23	16				
	8	7	5	20	18				
	6			19	19				
	5	5	4	17	16				
	5	4	2	20	13				
	5	8	5						
	6	6	3						
	7	4	2						
	7	6	6	15	13				
	9	12	10						
	12	11	8	17	5				
	14	9	7	15	17				
	13	13	10	22	7				
	7	7	7	25	21				
	5	5	5	39	30				
	6	6	6	20	15				
	3	3	1	16	15				
	18								
									H
									H
	5			16	10				
	9	4	2	18	19				
	7			17	15				
	17								
	4								
	5								
	3			7	7				
	6	5	3						
	7	6	4	25	23				
	5			25	24				
	7	4	3	24	24				

Table 19.6c cont'd Iron Nail Dimensions

Context (SU)	Material	Definition	# Fragments	# Intact	Weight	MNI	SF #	Length (bent)	Length (straight)	Section (1a)
11033	Iron	Nail	0	1	14	1	311025	46	52	8
11012	Iron	Nail	0	1	22	1	311026		42	13
11029	Iron	Nail	0	1	10	1	311028		41	
11029	Iron	Nail	0	1	16	1	311029		68	8
11012	Iron	Nail	1	0	3	1	311031		27	12
11027	Iron	Nail	1	0	12	1	311032		62	5
11029	Iron	Nail	0	1	15	1	311037		66	6
11048	Iron	Nail	1	0	12	1	311038	61	75	8
10048	Iron	Nail	1	0	9	1	311039		51	7
11048	Iron	Nail	1	0	25	1	311041		62	13
11053	Iron	Nail	1	0	14	1	311042		57	6
11029	Iron	Nail	1	0	7	1	311043			
11047	Iron	Nail	1	0	11	1	311044			
11059	Iron	Nail	1	0	7	1	311052		17	5
12002	Iron	Nail	1	0	5	1	312001		32	6
12004	Iron	Nail	0	1	13	1	312003		60	7
12004	Iron	Nail	1	0	15	1	312013		73	6
12004	Iron	Nail	1	0	2	1	312016		25	5
12024	Iron	Nail	1	0	9	1	312017		45	15
13006	Iron	Nail	1	0	7	1	313016		23	
14003	Iron	Nail	0	1	24	1	314003		86	9
14006	Iron	Nail	1	0	20	1	314007		62	9
14006	Iron	Nail	0	1	28	1	314008		80	12
14006	Iron	Nail	1	0	12	1	314011		48	9
14013	Iron	Nail	0	1	32	1	314028	115	122	6
14004	Iron	Nail	0	1	11	1	314031		54	7
14015	Iron	Nail	1	0	7	1	314034		40	9
14004	Iron	Nail	1	0	3	1	314035		31	6
14037	Iron	Nail	1	0	8	1	314073		45	10
14037	Iron	Nail	1	0	4	1	314073		37	7
14037	Iron	Nail	1	0	6	1	314074	35	40	9
14037	Iron	Nail	5	0	20	1	314077			
14038	Iron	Nail	1	0	39	1	314078		45	17
14038	Iron	Nail	1	0	4	1	314079			
14043	Iron	Nail	1	0	24	1	314083		5	14
14041	Iron	Nail	1	0	15	1	314086			
14054	Iron	Nail	1	0	3	1	314090			
17002	Iron	Nail	1	0	11	1	317008		52	10
18009	Iron	Nail	0	1	19	1	318011		55	9
19001	Iron	Nail	1	0	28	1	319003		59	10

	Section (1b)	Section (2a)	Section (2b)	Head 1	Head 2	Head form 1	Head form 2	Section form	Preservation
	7	6	5	16	15				
	12	10	9	22	20				
				25	25				
	7	3	1	16	11				
	7								
	4	4	3						
	6	5	3	16	14				
	6	3	3						
	6	5	3						
	12			24	16				
	5	5	3						
	4			23	20				
	4	4	2	13	13				
	6	5	4	12	10			R	B
	6	5	5	16	14				
	5					F	C		H
	8	3	2						
				20	20				
	7	6	4	17	17				
	7	9	7	28	23				
	10	6	5	23	18				
	8			14	12				
	6	6	4	23	23				
	6	5	4	15	14				
	8	7	6						
	6	6	3						
	9	10	2						
	7	4	4						
	9	7	7			F	C	R	I
	15	14	12	35	32				
	10	14	10	22	20				
	8	3	3						
	9	8	6						
	9	6	5	29	22				

Table 19.6c cont'd Iron Nail Dimensions

Context (SU)	Material	Definition	# Fragments	# Intact	Weight	MNI	SF #	Length (bent)	Length (straight)	Section (1a)
19003	Iron	Nail	1	0	16	1	319005		37	10
19002	Iron	Nail	2	0	11	2	319006		49	7
19002	Iron	Nail	0				319006		24	8
19002	Iron	Nail	1	0	9	1	319007		55	5
19011	Iron	Nail	0	1	24	1	319010		66	13
19007	Iron	Nail	1	0	19	1	319012		51	16
19007	Iron	Nail	2	0	25	2	319016		87	10
19007	Iron	Nail	0	0	0	0	319016		45	13
19007	Iron	Nail	1	0	24	1	319017		107	10
19000	Iron	Nail	1	1	49	2	319027		46	10

# Fragments = Count of fragmentary finds.
# Intact = Count of intact finds.
Weight = Weight (g).
Length (bent) = Length of nails which were bent or curving (if so bent)
Length (straight) = Length of nails, straight (reconstructed if bent, otherwise as is).
Section (1a) = Section dimension toward head (or terminal, if fragmentary) along y-axis.
Section (1b) = Section dimension toward head (or terminal, if fragmentary) along z-axis.
Section (2a) = Section dimension toward point (or terminal, if fragmentary) along y-axis.
Section (2b) = Section dimension toward point (or terminal, if fragmentary) along z-axis.
Head 1 = Head dimension along y-axis, if extant.
Head 2 = Head dimension along z-axis, if extant.
Head form 1 = Form of head, as either F (flat), D (domical).
Head form 2 = Form of head, as either C (circular, rounded, or ovoid) or R (rectangular), or (T) T-shaped.
Section Form = Form of section, either C (circular/ovoid) or R (rectangular).
Preservation = Level of preservation, I (at least both head and body present), H (only the head), or B (only a fragment of the body) preserved.

	Section (1b)	Section (2a)	Section (2b)	Head 1	Head 2	Head form 1	Head form 2	Section form	Preservation
	8	8	6	25	15				
	6	3	2						
	3	6	2						
	4	6	3						
	10	7	6	13	13				
	10	7	2						
	6	9	4						
	4	10	3			F	C	R	I
	9	6	5						
	7	6	5	23	23				

Table 19.6d Copper Nail Dimensions

Context (SU)	Material	Definition	# Fragments	# Intact	Weight	MNI	SF #	Length (bent)	Length (straight)	Section (1a)
10033	Copper Alloy	Nail	0	1	33	1	310032	71	96	11
10033	Copper Alloy	Nail	2	0	10	2	310038		49	7
10033	Copper Alloy	Nail					310038		41	5
10009	Copper Alloy	Nail	0	1	17	1	310062		27	4
10060	Copper Alloy	Nail	0	1	37	1	310074		63	10
10033	Copper Alloy	Nail	1	0	7	1	310090	49		6
10016	Copper Alloy	Nail	0	1	28	1	310104		86	11
11000	Copper Alloy	Nail	0	1	15	1	311020	86	92	6

# Fragments = Count of fragmentary finds.
# Intact = Count of intact finds.
Weight = Weight (g).
Length (bent) = Length of nails which were bent or curving (if so bent).
Length (straight) = Length of nails, straight (reconstructed if bent, otherwise as is).
Section (1a) = Section dimension toward head (or terminal, if fragmentary) along y-axis.
Section (1b) = Section dimension toward head (or terminal, if fragmentary) along z-axis.
Section (2a) = Section dimension toward point (or terminal, if fragmentary) along y-axis.
Section (2b) = Section dimension toward point (or terminal, if fragmentary) along z-axis.
Head 1 = Head dimension along y-axis, if extant.
Head 2 = Head dimension along z-axis, if extant.
Head form 1 = Form of head, as either F (flat), D (domical).
Head form 2 = Form of head, as either C (circular, rounded, or ovoid) or R (rectangular), or (T) T-shaped.
Section Form = Form of section, either C (circular/ovoid) or R (rectangular).
Preservation = Level of preservation, I (at least both head and body present), H (only the head), or B (only a fragment of the body) preserved.

	Section (1b)	Section (2a)	Section (2b)	Head 1	Head 2	Head form 1	Head form 2	Section form	Preservation
	9	2	2	20	19				B
	4	2	2						
	5	2	2						
	3	2	2	13	9				
	8	3	2	28	19	F	R	R	I
	5	3	2					R	B
	9	4	3	19	19	F	R	R	I
	5	2	1	15	14	F	C	R	I

Bibliography

Aarts, Joris. 2005. Coins, Money and Exchange in the Roman World. A Cultural-economic Perspective. *Archaeological Dialogues* 12(1):1–28.

Abdy, Richard. 2012. Tetrarchy and the House of Constantine. In *The Oxford Handbook of Greek and Roman Coinage*, edited by William E. Metcalf, pp. 584–600. Oxford: Oxford University Press.

Adam, Anne-Marie. 1984. *Bronzes étrusques et italiques*. Paris: Bibliothèque nationale.

Agnew, John. 1987. *Place and Politics: The Geographical Mediation of State and Society*. Boston: Allen & Unwin.

Aguarod Otal, Carmen. 1991. *Céramica romana importada de cocina en la Tarraconense*. Zaragoza: Institución Fernando el Católico.

Akerraz, Aomar, and Stephen A. Collins-Elliott. 2017. Gardens of the Hesperides: The Rural Archaeology of the Loukkos Valley. Interim Report on the 2016 Season. *The Journal of Fasti Online*. doi: www.fastionline.org/docs/FOLDER-sur-2017-5.pdf.

Akram-Lodhi, A. Haroon, and Cristóbal Kay. 2010. Surveying the Agrarian Question (Part 2): Current Debates and Beyond. *Journal of Peasant Studies* 37(2):255–284. doi: 10.1080/03066151003594906.

Alcock, Susan E., and John F. Cherry. 2004. *Side-by-Side Survey: Comparative Regional Studies in the Mediterranean World*. Oxford: Oxbow.

Alföldy, Géza. 1975. *Römische Sozialgeschichte*. Translated by David Braund and Frank Pollack. Wiesbaden: Franz Steiner.

Allen, Martyn, and Alexander Smith. 2016. Rural settlement in Roman Britain: Morphological Classification and Overview. In *The Rural Settlement of Roman Britain*, edited by Alexander Smith, Martyn Allen, Tom Brindle, and Michael Fulford, pp. 17–43. Oxford: Oxbow.

Allison, Penelope M. 1997. Roman Households: An Archaeological Perspective. In *Roman Urbanism: Beyond the Consumer City*, edited by Helen Parkins, pp. 112–146. London: Routledge.

Allison, Penelope. 2004. *Pompeii Households: An Analysis of the Material Culture*. Los Angeles: Cotsen Institute of Archaeology, University of California, Los Angeles.

Allison, Penelope. 2006. *The Insula of the Menander at Pompeii. Volume III: The Finds, A Contextual Study*. Oxford: Oxford University Press.

Ammerman, Albert J. 1985. Plow-zone experiments in Calabria, Italy. *Journal of Field Archaeology* 12(1):33–40.

Andreau, Jean, and Wladimir Berelowitch, eds. 2008. *Michel Ivanovitch Rostovtzeff*. Bari: Edipuglia.

Andrews, Colin. 2012. *Roman Seal-Boxes in Britain*. British Archaeological Reports, British Series 567. Oxford: Archaeopress.

Andrews, Colin. 2013. Are Roman Seal-boxes Evidence for Literacy? *Journal of Roman Archaeology* 26:423–438.

Andrews, David, John Bedford, and Paul Bryan, eds. 2009. *Metric Survey Specification for Cultural Heritage*. Swindon: Historic England.

Antonelli, Fabrizio, Giovanni Nappi, and Lorenzo Lazzarini. 2001. Roman Millstones from Orvieto (Italy): Petrographic and Geochemical Data for a New Archaeometric Contribution." *Archaeometry* 43(2):167–189.

Aranguren, Biancamaria, Lorenza Camin, Samantha Castelli, Anna Maria Esposito, Luisa Galetti, Giuliana Guidoni, Valeria Montanarini, Paola Perazzi, and Anna Wentkowska. 2007. Guerrieri e artigiani. L'alta valle del Cecina dalla preistoria al rinascimento. *Notiziario della Soprintendenza per i Beni Archeologici della Toscana* 3:108–130.

Arnold, Dean E. 1985. *Ceramic Theory and Cultural Process*. Cambridge: Cambridge University Press.

Arnoldus-Huyzendveld, Antonia. 2008. La carta del paesagggio e le sue applicazioni. In *Miranduolo in alta Val di Merse (Chiusdino - SI)*, edited by Marco Valenti, pp. 301–308. Florence: All'Insegna del Giglio.

Arnoldus-Huyzendveld, Antonia, and Elisabetta Pozzuto. 2008. Una lettura storica del paesaggio attuale: il territorio di Castel di Pietra tra Antichità e Medioevo. In *Dieci anni di ricerche a Castel di Pietra*, edited by Carlo Citter, pp. 15–39. Florence: All'Insegna del Giglio.

Arnon, Amir, Tal Svoray, and Eugene David. 2011. The Spatial Dimension of Pastoral Herding: A Case Study from the Northern Negev." *Israel Journal of Ecology & Evolution* 57(1–2):129–149.

Arslan, Ermanno. 2001. Le monete. In *Scavi MM3. Le ricerche di Archeologia Urbana a Milano durante la costruzione della linea 3 della Metropolitana, 1982–1990*, edited by Donatella Caporusso, pp. 71–130. Milan: Edizioni ET.

Arslan, Ermanno. 2003. Problemi ponderali di V secolo: verso la riforma del *Nummus*. Il deposito di Cafarnao. *Revue Numismatique* 159:27–39.

Arslan, Ermanno. 2009. Cultura monetaria e circolazione tra V e VIII secolo in Italia. In *Città e campagna nei secoli altomedievali*, edited by Andrea Castagnetti, pp. 975–1006. Spoleto: Fondazione CISAM.

Arthur, Paul. 2007. Pots and Boundaries. On Cultural and Economic Areas between Late Antiquity and the Early Middle Ages. In *LRCW 2, Late Roman Coarse Wares, Cooking Wares and Amphorae in the Mediterranean, Archaeology and Archaeometry*, edited by Michel Bonifay and Jean-Christophe Tréglia, pp. 15–28. Oxford: Archaeopress.

Ascheri, Mario, and Wilhelm Kurze. 1989. *L'Amiata nel medioevo*. Rome: Viella.

Ashmore, Wendy, and Arthur Bernard Knapp, eds. 1999. *Archaeologies of Landscape: Contemporary Perspectives*. Malden, MA: Wiley Blackwell.

Asolati, Michele. 2005. *ll tesoro di Falerii Novi. Nuovi contributi sulla monetazione italica in bronzo degli anni di Ricimero (457–472 d.C.)*. Padova: Esedra.

Attema, Peter, Gert-Jan Burgers, Ester van Joolen, Martjin van Leusen, and Benoit Mater, eds. 2002. *New Developments in Italian Landscape Archaeology: Theory and Methodology of Field Survey, Land Evaluation and Landscape Perception, Pottery Production and Distribution*. BAR International Series 1091. Oxford: Archaeopress.

Attema, Peter, and Günther Schörner. 2012. Introduction. In *Comparative Issues in the Archaeology of the Roman Rural Landscape. Site Classification between Survey, Excavation and Historical Categories*, edited by Peter Attema and Günther Schörner, pp. 7–10. Portsmouth, RI: Journal of Roman Archaeology.

Attolini, Ida, Franco Cambi, and Maria Grazia Celuzza. 1982. Recognizione archeologica nell'Ager Cosanus e nella valle dell'Albegna. Rapporto preliminare 1981. *Archeologia Medievale* 9:365–386.

Attolini, Ida, Franco Cambi, and Maria Grazia Celuzza. 1983. Recognizione archeologica nell'*Ager Cosanus* e nella valle dell'Albegna. Rapporto preliminare. *Archeologia Medievale* 10:439–466.

Auffret, Alistair, and Sara Cousins. 2013. Humans as Long-distance Dispersers of Rural Plant Communities. *PLoS ONE* 8(5). doi: doi:10.1371/journal.pone.0062763.

Bacchetta, Alberto. 2003. *Edilizia rurale romana. Materiali e tecniche costruttive della Pianura Padana (II sec. a.C.-IV sec. d.C.)*. Florence: All'Insegna del Giglio.

Bailey, Donald Michael. 1980. *A Catalogue of Lamps in the British Museum, vol. 2: Roman Lamps Made in Italy* London: British Museum.

Bakels, Corrie, and Stefanie Jacomet. 2003. Access to Luxury Foods in Central Europe during the Roman Period: The Archaeobotanical Evidence. *World Archaeology* 34(3):542–557.

Baker, Frederick. 2007. A Possible Roman Transhumance Site, in "The Field Surveys". In *Between Text and Territory: Survey and Excavations in the Terra of San Vincenzo al Volturno*, edited by Kim Bowes, Karen Francis, and Richard Hodges, pp. 13–48. London: British School at Rome.

Baldacci, Osvaldo. 1958. L'ambiente geografico della casa di terra in Italia. In *Studi geografici publicati in onore del Prof. Renato Biasutti*, pp. 13–43. Florence: Nuova Italia.

Baldassarri, Monica. 2011. I reperti numismatici: monete e medaglie. In *Archeologia in Piazza dei Miracoli. Gli scavi 2003–2009*, edited by Antonio Alberti and Emanuela Paribeni, pp. 477–512. Ghezzano: Felici.

Banaji, Jairus. 1992. Historical Arguments for a 'Logic of Development' in 'Precapitalist' Agriculture. *Journal of Historical Sociology* 5(4):379–391.

Banaji, Jairus. 2001. *Agrarian Change in Late Antiquity: Gold, Labour and Aristocratic Dominance*. Oxford: Oxford University Press.

Banaji, Jairus. 2003. The Fictions of Free Labour: Contract, Coercion, and So-called Unfree Labour. *Historical Materialism* 11(3):69–95.

Bang, Peter. 2008. *The Roman Bazaar: A Comparative Study of Trade and Markets in a Tributary Empire*. Cambridge: Cambridge University Press.

Barbieri, Gabriella. 2003. Poggio Grillo. *FASTI Online Italy*. doi: http://www.fastionline.org/excavation/site/AIAC_124.

Barbieri, Gabriella. 2005a. Aspetti del popolamento della media Valle dell'Ombrone nell'antichità: indagini recenti nel territorio di Civitella Paganico. *Rivista di topografia antica* 15:119–136.

Barbieri, Gabriella. 2005b. L'insediamento rurale romano di Poggio Grillo. In *Carta archeologica della provincia di Siena. Vol. VII. Radicofani*, edited by Lucia Botarelli, pp. 47–51. Siena: Nuova Immagine.

Barbieri, Gabriella. 2008–9. RADICOFANI (Si) fraz. Contignano Toscana – Scavo di una fattoria romana a Poggio Grillo. *Notizie degli scavi di antichità* Ser. 9(19–20):1–47.

Barker, Graeme, ed. 1995. *A Mediterranean Valley: Landscape Archaeology and Annales History in the Biferno Valley*. London: Leicester University Press.

Barker, Graeme. 2006. *The Agricultural Revolution in Prehistory*. Oxford: Oxford University Press.

Barker, Graeme, and Annie Grant. 1991. Ancient and Modern Pastoralism in Central Italy: An Interdisciplinary Study in the Cicolano Mountains. *Papers of the British School in Rome* 59:15–88.

Baxter M.J. 1994. *Exploratory Multivariate Analysis in Archaeology*. Edinburgh: Edinburgh University Press.

Beck, Robin, ed. 2007. *The Durable House: House Society Models in Archaeology, Center for Archaeological Investigations, Occasional Paper No. 35*. Carbondale: Southern Illinois University.

Behre, Karl-Ernst. 1986. *Anthropogenic Indicators Pollen Diagrams*. Rotterdam: A.A. Balkema.

Bell, Tyler, and Gary Lock. 2000. Topographic and Cultural Influences on Walking the Ridgeway in Later Prehistoric Times. In *Beyond the Map: Archaeology and Spatial Technologies*, edited by Gary Lock, pp. 85–100. Amsterdam: IOS Press.

Bellini, Cristina, Marta Mariotti-Lippi, and Carlo Montanari. 2009. The Holocene Landscape History of the NW Italian Coasts. *The Holocene* 19(8):1161–1172.

Beloch, Karl Julius. 1886. *Die Bevölkerung der griechisch-römischen Welt*. Leipzig: Duncker & Humblot.

Bentley, Jeffery. 1987. Economic and Ecological Approaches to Land Fragmentation: In Defense of a Much-maligned Phenomenon. *Annual Review of Anthropology* 16(1):31–67.

Benvenuti, G., M. Brondi, M. Dall'Aglio, R. Da Roit, De Cassan P., E. Ghiara, C. Gigli, G. Marinelli, M. Martini, R. Gragnani, C. Orlandi, and G. Paganin. 1971. L'idrologia. In *La Toscana meridionale: fondamenti geologico-minerari per una prospettiva di valorizzazione delle risorse naturali*, pp. 211–316. Pavia: Editrice succ. Fusi.

Bérato, Jacques. 2009. Petits établissements ruraux antiques dans le Var. In *Les formes de l'habitat rural gallo-romain. Colloque AGER VIII*, edited by Philippe Leveau, Claude Raynaud, Robert Sablayrolles, and Frédéric Trément, pp. 123–140. Bordeaux: Fédération Aquitania.

Beretta, Maro, and Giovanni Di Pasquale, eds. 2007. *Vitrum, il vetro tra arte e scienza*. Prato: Giunti.

Bergamini, Margherita. 2007a. Il rapporto col Tevere. In *Scoppieto I. Il territorio e i materiali*, edited by M. Bergamini, pp. 79–96. Florence: All'Insegna del Giglio.

Bergamini, Margherita. 2007b. Stato della ricerca e degli studi. In *Scoppieto I. Il territorio e i materiali*, edited by Margherita Bergamini, pp. 57–70. Florence: All'Insegna del Giglio.

Bergamini, Margherita, and Marcello Gaggiotti. 2007. Il territorio in età antica: fonti documentarie e archeologiche. In *Scoppieto I. Il territorio e i materiali*, edited by M. Bergamini, pp. 41–53. Florence: All'Insegna del Giglio.

Berggren, Eric. 1969. Blera (Località Selvasecca). Villa rustica etrusco-romano con manifattura di terrecotte architettoniche. *Notizie degli Scavi di Antichità* ser. 8.23:51–59.

Bernigaud, Nicolas, Pierre Ouzoulias, Sébastien Lepetz, Julian Wiethold, Véronique Zech-Matterne, and Jean-Marc Séguier. 2015. Exploitations agricoles et pratiques agro-pastorales dans les campagnes du nord-est de la Gaule (iie s. av. J.-C.-ve

s. ap. J.-C.): l'apport des données de l'archéologie préventive d'Île de France et de Lorraine. In *Méthodes d'analyse des différents paysages ruraux dans le nord-est de la Gaule romaine*, edited by Michel Reddé: HAL.

Bernstein, Henry, and Terence Byers. 2001. From Peasant Studies to Agrarian Change. *Journal of Agrarian Change* 1(1):1–56.

Bertino, Antonio. 1983. Monete attestate a Luni dal IV al IX secolo. *Rivista di Studi Liguri* 49:265–300.

Bertoldi, Tommaso. 2012. *Guida alle anfore romane di età imperiale. Forme, impasti e distribuzione*. Rome: Monte Compatri Edizioni Espera.

Bertucchi, Guy. 1992. *Les amphores et le vin de Marseille: VIe s. avant J.C.–IIe s. après J.C.* Paris: Centre National de la Recherche Scientifique.

Binford, Lewis 1980. Willow Smoke and Dogs' Tails: Hunter-gatherer Settlement Systems and Archaeological Site Formation. *American Antiquity* 45(1):4–20. doi: 10.2307/279653.

Binford, Lewis. 1982. The Archaeology of Place. *Journal of Anthropological Archaeology* 1(1):5–31.

Bintliff, John, ed. 1991. *The Annales School and Archaeology*. Leicester: Leicester University Press.

Bintliff, John. 2002. Settlement Pattern Analysis and Demographic Modeling. In *New Developments in Italian Landscape Archaeology: Theory and Methodology of Field Survey, Land Evaluation and Landscape Perception, Pottery Production and Distribution*, edited by Peter Attema, Gert-Jan Burgers, Ester van Joolen, Martjin van Leusen, and Benoit Mater, pp. 28–35. Oxford: Archaeopress.

Bintliff, John, Emeri Farinetti, Phil Howard, Kalliope Sarri, and Kostas Sbonias. 2002. Classical Farms, Hidden Prehistoric Landscapes and Greek Rural Survey: A Response and an Update. *Journal of Mediterranean Archaeology* 15(2):259–265.

Bintliff, John, and Anthony Snodgrass. 1988. Off-site Pottery Distribution: A Regional and Interregional Perspective. *Current Anthropology* 29(3):506–513.

Bintliff, John L., Phil Howard, and Anthony Snodgrass, eds. 2007. *Testing the Hinterland: The Work of the Boeotia Survey (1989–1991) in the Southern Approaches to the City of Thespiai*. Cambridge: Cambridge University Press.

Biserni, Giacomo, and Bas van Geel. 2005. Reconstruction of Holocene Palaeoenvironment and Sedimentation History of the Ombrone Alluvial Plain (South Tuscany, Italy). *Review of Palaeobotany and Palynology* 136(1–2):16–28. doi: 10.1016/j.revpalbo.2005.04.002.

Bishop, Mike. 1988. Cavalry Equipment of the Roman Army in the 1st Century AD. In *Military Equipment and the Identity of Roman Soldiers. Proceedings of the Fourth Roman Military Equipment Conference*, edited by J.C. Coulston, pp. 67–195. Oxford: Archaeopress.

Blake, Marion, and Esther Van Deman. 1947. *Ancient Roman Construction in Italy from the Prehistoric Period to Augustus*. Washington, DC: Carnegie Institution of Washington.

Blanton, Richard. 1994. *Houses and Households. A Comparative Study, Interdisciplinary Contributions to Archaeology*. New York: Plenum Press.

Bloch, Marc. 1931. *Les caractères originaux de l'histoire rurale française*. Paris: Librairie Armand Colin.

Bloch, Marc. 1939–40. *Le société féodale*. Paris: Editions Albin Michel.

Blöck, Lars. 2019. A Model for Calculating the Capacities of Horrea and Agricultural Areas of Gallo-Roman Villae in the Province of Germania Superior. In *Rural Granaries in Northern Gaul (6th Century BCE–4th Century CE)*, edited by Stéphane Martin, pp. 13–22. Leiden: Brill.

Bochicchio, Leonardo. 2012. Le monete. In *La villa romana dei Cecina a San Vincenzino (Livorno). Materiali dello scavo e aggiornamenti sulle ricerche*, edited by Fulvia Donati, pp. 626–643. Ghezzano: Felici.

Bodel, John. 1997. Monumental Villas and Villa Monuments. *Journal of Roman Archaeology* 10:5–35.

Bodel, John. 2008. Cicero's Minerva. In *Household and Family Religion in Mediterranean and West Asian Antiquity*, edited by John Bodel and Saul Olyan, pp. 248–275. Oxford: Wiley-Blackwell.

Bökönyi, Sandor. n.d. Animal Bones from Ossaia.

Bolton, Angie. 2002. WMID4220: A Roman Seal Box. *Portable Antiquities Scheme*. doi: https://finds.org.uk/database/artefacts/record/id/45973.

Bølviken, Erik, Ericka Helskog, Knut Helskog, Inger Holm-Olsen, Leiv Solheim, and Reidar Bertelse. 1982. Correspondence Analysis: An Alternative to Principal Components. *World Archaeology* 14:41–60.

Bonifay, Michel. 2004. *Etudes sur la céramique romaine tardive d'Afrique, BAR International Series,*

1301. Oxford: Archaeopress.

Booth, T.A., and A.J. Richards. 1978. Studies in the Hordeum murinum L. aggregate: disc electrophoresis of seed proteins. *Botanical Journal of the Linnaean Society* 76(2):115–125.

Borghi, Rachele. 2002. *Chiusi Atlante tematico di topografia antica. XIV Supplemento*. Rome: L'Erma di Bretschneider.

Boscato, Paolo, and Cynthia Mascione. 2007–8. I resti faunistici dall'insediamento romano di Pantani-Le Gore (Torrita di Siena-SI). *Rassegna di Archeologia* 23B:95–110.

Boserup, Ester. 1965. *The Conditions of Agricultural Growth*. London: George Allen & Unwin.

Bosi, Giovanna , Marta Bandini Mazzanti, Assunta Florenzano, Isabella Massamba N'siala, Aurora Pederzoli, Rossella Rinaldi, Paola Torri, and Anna Maria Mercuri. 2011. Seeds/Fruits, Pollen and Parasite Remains as Evidence of Site Function: Piazza Garibaldi - Parma (N Italy) in Roman and Mediaeval Times. *Journal of Archaeological Science* 38:1621–1633.

Bosi, Giovanna, Donato Labate, Rosella Rinaldi, Maria Chiara Montecchi, Marta Mazzanti, Paola Torri, Federica M. Riso, and Anna Maria Mercuri. 2019. A Survey of the Late Roman Period (3rd–6th century AD): Pollen, NPPs and Seeds/Fruits for Reconstructing Environmental and Cultural Changes after the Floods in Northern Italy. *Quaternary International* 499 (part A):3–23.

Botarelli, Lucia, ed. 2004. *Carta archeologica della provincia di Siena. Vol. 7. Radicofani*. Siena: Nuova Immagine.

Bottema, Sytze. 1975. The interpretation of pollen spectra from prehistoric settlements (with special attention to Liguliflorae). *Palaeohistoria* 17:257–288.

Boube-Piccot, Christine. 1980. *Les bronzes antiques du Maroc, III. Les chars et l'attelage*. Rabat: Musée des Antiquités.

Bouchaud, Charlène. 2014. Gestion et utilisation des combustibles végétaux dans les structures thermales : Études carpologiques et anthracologiques de cinq thermes des époques byzantines et omeyyades au Proche-orient. In *Balaneia. 25 siècles de bain collectif en Orient*, edited by Marie-Françoise Boussac, Sylvie Denoix, Thibaud Fournet and Bérangère Redon, pp. 595–610. Cairo: Institut français d'archéologie orientale.

Bourdieu, Pierre. 1977. *Outline of a Theory of Practice* Translated by R. Nice. Cambridge: Cambridge University Press.

Bourdieu, Pierre. 1979. *La distinction, critique sociale du jugement*. Paris: Les Éditions de Minuit.

Bourdieu, Pierre, and Monique De Saint-Martin. 1976. L'anatomie du gout. *Actes de la recherche en sciences sociales* 2(5):2–81.

Bowes, Kim, Anna Maria Mercuri, Eleonora Rattigheri, Rossella Rinaldi, Antonia Arnoldus-Huyzendveld, Mariaelena Ghisleni, Cam Grey, Michael MacKinnon, and Emanuele Vaccaro. 2017. Peasant Agricultural Strategies in Southern Tuscany: Convertible Agriculture and the Importance of Pasture. In *The Economic Integration of Rural Italy. Rural Communities in a Globalizing World*, edited by de T. Haas and G.W. Tol, pp. 170–199. Leiden: Brill.

Bowes, Kimberly, and Emanuele Vaccaro. forthcoming. A Lowland Early Medieval Farmhouse (?) at Colle Massari, Cinigiano (GR).

Bowman, Alan, and Andrew Wilson, eds. 2011. *Settlement, Urbanization and Population*. Oxford: Oxford University Press.

Bowman, Alan, and Andrew Wilson, eds. 2013. *The Roman Agricultural Economy: Organization, Investment, and Production*. Oxford: Oxford University Press.

Brando, Massimo. 2015. La suppellettile da illuminazione. In *Diana Umbronensis a Scoglietto. Santuario, Territorio e Cultura Materiale (200 a.C.–550 d.C.),* edited by Alessandro Sebastiani, Elena Chirico, Matteo Colombini, and Mario Cygielman, pp. 114–224. Oxford: Archaeopress.

Brogiolo, Gian Pietro. 1994. L'edilizia residenziale tra V e VIII secolo: un' introduzione. In *Edilizia residenziale tra V e VIII secolo*, edited by G.P. Brogiolo, pp. 7–13. Monte Barro: Società Archeologica Padana.

Brogiolo, Gian Pietro, and Alexandra Chavarría. 2005. *Aristocrazie e campagne nell'Occidente da Costantino a Carlo Magno*. Florence: All'Insegna del Giglio.

Brown, Duncan. 1997. Pots from Houses. *Medieval Ceramics* 21:83–94.

Brown, Frank. 1980. *Cosa: The Making of a Roman Town*. Ann Arbor: University of Michigan Press.

Brown, Kimberly. 2004. Fluxgate Gradiometry and the Investigation of Archaic Period Rural

Settlement in Central Italy (600–450 BC). Ph.D. diss., Art and Archaeology of the Mediterranean World, University of Pennsylvania.

Brown, Peter. 1971. The Rise and Function of the Holy Man in Late Antiquity. *Journal of Roman Studies* 61:80–101.

Brughmans, Tom, John Hanson, Matthew Mandich, Iza Romanowska, Xavier Rubio-Campillo, Simon Carrignon, Stephen Collins-Elliott, Katherine Crawford, Dries Daems, Francesca Fulminante, Tymon de Haas, Paul Kelly, Maria del Carmen Moreno Escobar, Eleftheria Paliou, Luce Prignano, and Manuela Ritondale. 2019. Formal Modelling Approaches to Complexity Science in Roman Studies: A Manifesto. *Theoretical Roman Archaeology Journal* 2(1):1–19. doi: http://doi.org/10.16995/traj.367.

Bruhns, Hinnerk. 2005. Mikhail I. Rostovtzeff et Max Weber: une rencontre manquée de l'histoire avec l'économie. *Anabases* 2:79–99.

Bruhns, Hinnerk, and Jean Andreau, eds. 2004. *Sociologie économique et économie de l'Antiquité : à propos de Max Weber*, *Cahiers du Centre de recherches historiques, n° 34*. Paris: Centre National de la Recherche Scientifique.

Brun, Jean-Pierre. 1986. *L'oléiculture antique en Provence: les huileries du département du Var*, *Revue archéologique de Narbonnaise, Supplément 15*. Paris: Editions du Centre national de la recherche scientifique.

Brun, Jean-Pierre. 2003. *Archéologie du vin et de l'huile de la Préhistoire à l'époque hellénistique*. Paris: Errance.

Brun, Jean-Pierre. 2004. *Archéologie du vin et de l'huile dans l'Empire romain*. Paris: Errance.

Brun, Jean-Pierre. 2005. *Archéologie du vin et de l'huile en Gaule romaine*. Paris: Errance.

Brun, Jean-Pierre, Gaétan Congès, and Michel Pasqualini. 1993. *Les fouilles de Taradeau. Le fort, l'Ormeau et tout-egau*, *Revue archéologique de Narbonnaise, 28*. Paris: CNRS Éditions.

Brunt, P.A. 1971. *Italian Manpower 225 B.C.–A.D. 14*. Oxford: The Clarendon Press.

Brunt, P.A. 1975. Two Great Roman Landowners. *Latomus* 34:619–635.

Buck, Caitlyn, William Cavanagh, and Cliff Litton. 1996. *Bayesian Approach to Interpreting Archaeological Data*. Chichester: John Wiley & Sons.

Buck, Caitlyn, and Bo Meson. 2015. On Being a Good Bayesian. *World Archaeology* 47:567–584.

Buonincontri, Mauro, Emilia Allevato, and Gaetano Di Pasquale. 2013. The Problem of the Alternating Dominance of Deciduous and Evergreen Vegetation: Archaeo-anthracological Data from Northern Maremma. *Annali di Botanica* 3:165–171.

Burnett, Andrew. 1987. *Coinage in the Roman World*. London: Seaby.

Burnett, Andrew. 1991. *Roman Provincial Coinage*. London: British Museum Press.

Burri, Sylvain. 2014. Reflections on the Concept of Marginal Landscape through a Study of Late Medieval Incultum in Provence (South-eastern France). *European Journal of Post Classical Archaeologies* 4:7–38.

Buttrey, T. 1980. Cosa: The Coins. *Memoires of the American Academy in Rome* 34:11–153.

Buttrey, Theodore. 2004. The Greek and Roman Coins. In *Cosa V: An Intermittent Town, Excavations 1991–1997*, edited by Elisabeth Fentress, pp. 250–259. Ann Arbor: University of Michigan Press.

Cagnana, Aurora. 2003. La cristianizzazione delle aree rurali in Friuli Venezia Giulia fra V e VI secolo. In *Chiese e insediamenti nelle campagne tra V e VI secolo*, edited by Gian Pietro Brogiolo, pp. 217–244. Mantova: Società Archeologica Padana.

Cambi, Franco, ed. 1996. *Carta Archaeologica di Siena. Vol. 2. Il Monte Amiata*. Siena: Nuova Immagine.

Cambi, Franco. 2002. La casa del colono e il paesaggio (III-II secolo a.C.). In *Paesaggi d'Etruria. Valle dell'Albegna, Valle d'Oro, Valle del Chiarone, Valle del Tafone. Progetto di ricerca italo-britannico seguito allo scavo di Settefinestre*, edited by Andrea Carandini, Franco Cambi, Maria Grazia Celuzza, Elisabeth Fentress and Ida Attolini, pp 137–144. Rome: Edizioni di storia e letteratura.

Cambi, Franco. 2004. Le campagne di Falerii e di Capena dopo la romanizzazione. In *Bridging the Tiber: Approaches to Regional Archaeology in the Middle Tiber Valley*, edited by Helen Patterson, pp. 75–101. London: British School at Rome.

Cambi, Franco, and Giuliano Volpe. 1985. Contenitori da cantina e da trasporto. In *Settefinestre, una villa schiavistica nell'Etruria Romana. Vol 3. La villa e i suoi reperti*, edited by Andreina Ricci, pp. 72–92. Modena: Panini.

Camilli, Luciano, and Sara Sorda, eds. 1993. *L'inflazione nel IV secolo d.C., Atti dell'incontro di studio*. Rome: Italiano Numismatica.

Camin, Lorenza. 2004–2005. Modelli di insediamento e strutture abitative rurali nella media Val di Cecina fra età ellenistica ed età romana: l'esempio di Podere Cosciano. *Laboratorio Universitario Volterrano - Quaderno* 9:77–84.

Camin, Lorenza. 2014. Pomarance (PI). Il dolium per l'allevamento dei ghiri di podere San Mario: alcune considerazioni sulla diffusione del tipo in Toscana. *Notiziario della Soprintendenza per i Beni Archeologici della Toscana* 10:338–340.

Camin, Lorenza, and W. McCall. 2003–04. Settlement Patterns and Rural Habitation in the Middle Cecina Valley between the Hellenic to Roman Age: The Case of Podere Cosciano. *Etruscan Studies* 9:19–28.

Campana, Stefano. 2012–2014. Santa Marta. *Fasti Online*. doi: http://www.fastionline.org/site/AIAC_2915.

Campana, Stefano, ed. 2013. *Carta archeologica della provincia di Siena. Vol. 12: Montalcino*. Siena: Nuova Immagine.

Campana, Stefano. 2017. Emptyscapes: Filling an 'Empty' Mediterranean Landscape at Rusellae, Italy. *Antiquity* 91(359):1223–1240.

Campana, Stefano, Cristina Felici, Riccardo Francovich, and Fabbio Gabbrielli, eds. 2008. *Chiese e insediamenti nei secoli di formazione dei paesaggi medievali della Toscana (V–X secolo)*. Florence: All'Insegno del Giglio.

Cantini, Federico. 2008. La chiesa e il borgo di San Genesio: primi risultati dello scavo di una grande Pieve della Toscana altomedievale (Campagne di scavo 2001–2007). In *Chiese e insediamenti nei secoli di formazione dei paesaggi medievali toscani. Il rapporto fra le chiese e gli insediamenti tra V e X secolo*, edited by Stefano Campana, Cristina Felici, and Fabbio Gabbrielli, pp. 65–94. Florence: All'Insegna del Giglio.

Cantini, Federico. 2009. Produzione, circolazione e consumo del vasellame decorato con ingobbio rosso in Toscana tra I-II e XIII secolo d.C. In *La ceramica dipinta in rosso. I contesti laziali a confronto con altre realtà italiane*, edited by Elisabetta De Minicis, pp. 59–79. Viterbo: Kappa.

Capogrossi Colognesi, Luigi. 1986. Grandi proprietari, contadini e coloni nell'Italia romana (I–III d.c.). In *Società romana e impero tardoantico*, edited by Andrea Giardina, pp. 325–365. Rome: Laterza.

Capogrossi Colognesi, Luigi. 2009. A Provocation. *Rivista di Storia Economica* 25(3):421–438.

Capozza, Maria. 1966. *Movimenti servili nel mondo romano in età repubblicana*. Rome: L'Erma di Bretschneider.

Carandini, Andrea. 1979. *Archeologia e cultura materiale*. Bari/Rome: De Donato.

Carandini, Andrea, ed. 1981. *Atlante della forme ceramiche. I. Ceramica fine romana nel bacino mediterraneo (medio e tardo impero)*. Rome: Istituto della Enciclopedia Italiana.

Carandini, Andrea. 1985a. Da villa perfecta. In *Settefinestre, una villa schiavistica nell'Etruria Romana*, edited by Andrea Carandini, pp. 107–137. Modena: Panini.

Carandini, Andrea, ed. 1985b. *Settefinestre, una villa schiavistica nell'Etruria Romana*. 3 vols. Modena: Panini.

Carandini, Andrea. 1988. *Schiavi in Italia : gli strumenti pensanti dei Romani fra tarda Repubblica e medio Impero*. Rome: Nuova Italia Scientifica.

Carandini, Andrea. 1989. Italian Wine and African Oil: Commerce in a World Empire. In *The Birth of Europe: Archaeology and Social Development in the First Millennium AD*, edited by Klaus Randsborg, pp. 16–31. Rome: L'Erma di Bretschneider.

Carandini, Andrea, Franco Cambi, Maria Grazia Celuzza, and Elisabeth Fentress. 2002. *Paesaggi d'Etruria. Valle dell'Albegna, Valle d'Oro, Valle del Chiarone, Valle del Tafone. Progetto di ricerca italo-britannico seguito allo scavo di Settefinestre*. Rome: Edizioni di storia e letteratura.

Carreté, Josep Maria, Simon Keay, and Martin Millett. 1995. *A Roman Provincial Capital and its Hinterland: The Survey of the Territory of Tarragona, Spain, 1985–1990* (Journal of Roman Archaeology. Supplementary Series, 15). Ann Arbor: Journal of Roman Archaeology.

Caselli, Giovanni, and Silvano Guerrini. 1977. *Viaggio nella cultura contadina*.Florence: La Graticola.

Castelletti, L. 1974. Segale (secale cereale L) subfossile a Lomello. *Atti Centro Studi Italia Romana* 6:55–71.

Cayn, Philippe, Jérôme Kotarba, Christophe Pellecuier, and Hervé Pomardès. 2017. Céréaliculture, élevage et viticulture en Languedoc méditerranéen: nouvelles données pour une relecture des systèmes de production en Gaule Narbonnaise. In *Produire, transformer et stocker dans les campagnes des Gaules romaines*, edited

by Frédéric Trément, pp. 215–237. Bordeaux: Fédération Aquitania.

Celuzza, Maria Grazia. 2013. Il territorio di Roselle. In *Roselle: le monete dagli scavi archeologici (1959–1991) e dal territorio*, edited by Massimo De Benetti and Fiorenzo Catalli, pp. 257–259. Grosseto: Ministero per i beni e le attività culturali.

Celuzza, Maria Grazia, Elena Chirico, and Matteo Colombini. 2015. L'ager Rusellanus e la città di Rusellae dalla romanizzazione all'età imperiale, III secolo a.C - II secolo d.C. In *Diana Umbronensis a Scoglietto. Santuario, Territorio e Cultura Materiale (200 a.C.–550 d.C.)*. edited by A. Sebastiani, E. Chirico, M. Colombini, and M. Cygielman, pp. 343–357. Oxford: Archaeopress.

Celuzza, Maria Grazia, and Mario Cygielman. 2013. Scavi archeologici e ricerche (1959–1991). In *Roselle. Le monete dagli scavi archeologici (1959–1991) e dal territorio*, edited by Massimo De Benetti and Fiorenzo Catalli, pp. 27–38. Grosseto: Ministero per i beni e le attività culturali.

Celuzza, Maria Grazia, M.L. Famà, and Mariette De Vos. 1985. Strumenti da lavoro agricolo, caccia, pesca e misurazione. In *Settefinestre, una villa schiavistica nell'Etruria Romana. Vol 3. La villa e i suoi reperti*, edited by Andreina Ricci, pp. 65–68. Modena: Panini.

Centre de recherche et d'application - Terre. 1979. *Construire en terre*. Paris: Éditions alternatives.

Cepeda, Juan José. 1991. Due ripostigli monetali di V secolo d.C. rinvenuti a Roma. Villa Giulia 1922–Pratica di Mare 1967. *Bollettino di Numismatica* 16–17:7–199.

Cerilli, Eugenio. 2005. Consumi alimentari in una mansio romana: il caso del Mansio ad Vacanas (Valle di Baccano, Campagnano di Roma, Lazio). In *Atti del 3° Convegno Nazionale di Archeozoologia*, edited by I. Fiore, G. Malerba, and S. Chilardi, pp. 433–441. Rome: Istituto Poligrafico e Zecca dello Stato. Studi di Paletnologia II. Collana del Bullettino di Paletnologia Italiana.

Certeau, Michel de. 2002. *The Practice of Everyday Life*. Translated by S. Rendall. Berkeley: University of California Press. Original edition, 1984.

Chandezon, Christophe. 2015. Animals, Meat, and Alimentary By-products: Patterns of Production and Consumption. In *Companion to Food in the Ancient World*, edited by J. Wilkins and R. Nadeau, pp. 135–146. London: Wiley-Blackwell.

Chang, Yang-Ming, Biing-Wen Huang, and Yun-Ju Chen. 2012. Labor Supply, Income, and Welfare of the Farm Household. *Labour Economics* 19(3):427–437.

Chastagnol, André. 1982. *L'évolution politique, sociale et économique du monde romain de Dioclétien à Julien : la mise en place du régime du Bas-Empire (284–363)*. Paris: SEDES.

Chayanov, Alexander. 1966. *The Theory of Peasant Economy*. Homewood, IL: American Economic Association.

Cherry, John, Jack Davis, and E. Mantzourani. 1991. *Landscape Archaeology as Long-Term History: Northern Keos in the Cycladic Islands from the Earliest Settlement until Modern Times* (Monumenta Archaeologica 16). Los Angeles: Institute of Archaeology, University of Los Angeles.

Cherubini, Linda, Antonella Del Rio, and Simonetta Menchelli. 2006. Paesaggi della produzione: attività agricole e manifatturiere nel territorio pisano-volterrano in età Romana. In *Territorio e produzioni ceramiche. Paesaggi, economia e società in età romana*, edited by Simonetta Menchelli and Margherita Pasquinnuci, pp. 69–76. Pisa: Università di Pisa.

Chioffi, Laura. 1989–1990. Ancora inediti dal sepolcreto di S. Paolo sulla via Ostiense. Un campione significativo dei suoi occupanti: i Ciartii. *Bullettino della Commissione archeologica Comunale di Roma* 93(2):391–406.

Christie, Neil. 2006. *From Constantine to Charlemagne: An Archaeology of Italy AD 300–800*. Aldershot: Ashgate.

Chrupek, Daniel, Jarosław Groberek, Roman Niżnikowski, Henryk Brzostowski, Ewa Strzelec, Dominik Popielarczyk, and Michał Marciniec. 2006. Characteristic of Polish Heath Sheep Grazing Behaviour on Fallow Lands during Vegetative Period, Concerning Pasturage Time and Weather Conditions. *Archiv Tierzucht* 49:353–358.

Ciampoltrini, Giulio. 1997. Albinia, fluvius habet positionem. Scavi 1983–1988 nell'approdo alla foce dell'albegna (Orbetello, Gr). *Rassegna di Archeologia* 14:253–295.

Ciampoltrini, Giulio. 2004. Insediamenti e strutture rurali nella Piana di Lucca tra Tarda Repubblica e prima eta' imperiale. *Journal of Ancient Topography* 14:8–24.

Ciampoltrini, Giulio, and Michaelangelo Zecchini, eds. 2005. *Le dimore dell'Auser. Archeologia,*

architettura, ambiente dell'antico lago di Sesto. Lucca: S. Marco.

Ciaraldi, Marina. 2007. *People and Plants in Ancient Pompeii* (Accordia Specialist Studies on Italy, 12). London: Accordia Research Institute, University of London.

Ciccotti, Ettore. 1899. *Il tramonto della schiavitù nel mondo antico : un saggio*. Turin: L'Erma di Bretschneider.

Cirelli, Enrico, Francesca Diosono, and Helen Patterson, eds. 2015. *Le forme della crisi. Produzioni ceramiche e commerci nell'Italia centrale tra Romani e Longobardi*. Bologna: Ante Quem.

Citter, Carlo. 2007. Il territorio di Roselle-Grosseto: occupazione del suolo e forme insediative dalla preistoria al medioevo. In *Archeologia urbana a Grosseto. Origine e sviluppo di una città medievale nella "Toscana delle città deboli". Le ricerche 1997–2005*, edited by C. Citter and A. Arnoldus-Huyzendveld, pp. 25–45. Florence: All'Insegna del Giglio.

Citter, Carlo, and Antonia Arnoldus-Huyzendveld, eds. 2007. *Archeologia urbana a Grosseto. Origine e sviluppo di una città medievale nella "Toscana delle città deboli". Le ricerche 1997–2005*. Florence: All'Insegno del Giglio.

Citter, Carlo, and Antonia Arnoldus-Huyzendveld, eds. 2011. *Uso e sfruttamento delle risorse nella pianura grossetana nel medioevo verso una storia del parcellario e del paesaggio agrario*. Rome: Artemide.

Clark, R., and A. Schofield. 1991. By Experiment and Calibration: An Integrated Approach to Archaeology of the Ploughsoil. In *Interpreting Artefact Scatters: Contributions to Ploughzone Archaeology*, edited by A.J. Schofield, pp. 93–105. Oxford: Oxbow.

Clarke, Mari. 2000. Changing House and Population Size on Methana, 1880–1996: Anomaly or Pattern. In *Contingent Countryside: Settlement, Economy and Land Use in the Southern Argolid Since 1700*, edited by Susan Buck Sutton, pp. 107–124. Stanford, CA: Stanford University Press.

Close, Angela. 2000. Reconstructing Movement in Prehistory. *Journal of Archaeological Method and Theory* 7(1):49–77.

Coarelli, Filippo. 1977. Public Building in Rome between the Second Punic War and Sulla. *Papers of the British School at Rome* 45:1–23.

Collavini, Simone Maria. 1998. *Honorabilis domus et spetiosissimus comitatus. Gli aldobrandeschi da Conti a Principi territoriali (sec. IX-XIII)*. Pisa: ETS.

Collins, Daryl, Jonathan Morduch, Stuart Rutherford, and Orlanda Ruthven. 2009. *Portfolios of the Poor*. Princeton: Princeton University Press.

Collins-Elliott, Stephen. 2017. Rural Culture in Roman Tuscany: Small Finds from the Roman Peasant Project. AIA Colloquium Panel "Small Finds Writ Large," 118th Annual Meeting of the Archaeological Institute of America, Toronto, ON.

Collins-Elliott, Stephen. 2018. A Behavioral Analysis of Monetary Exchange and Craft Production in Rural Tuscany via Small Finds from the Roman Peasant Project. *Journal of Mediterranean Archaeology* 31:155–179.

Collins-Elliott, Stephen. 2019 Quantifying Artifacts over Time: Interval Estimation of a Poisson Distribution Using the Jeffreys Prior. *Archaeometry* 61(5):1207–1222. doi: 10.1111/arcm.12481.

Collins-Elliott, Stephen, and Kim Bowes. 2016. New Evidence of the Gens Ciartia: An Etruscan Tile Stamp from Cinigiano (GR), loc. Tombarelle. *Journal of Etruscan Studies* 19(1):149–154.

Conant, Jonathan. 2013. Public Administration, Private Individuals and the Written Word in Late Antique North Africa, c. 284–700. In *Documentary Culture and the Laity in the Early Middle Ages*, edited by W. Brown, M. Costambeys, M. Innes, and A. Kosto, pp. 36–61. Cambridge: Cambridge University Press.

Condamin, J., F. Formenti, M.O. Metais, M. Michel, and P. Blond. 1976. The Application of Gas Chromatography to the Tracing of Oil in Ancient Amphorae. *Archaeometry* 18(2):195–201.

Cool, Helen. 2006. *Eating and Drinking in Roman Britain*. Cambridge: Cambridge University Press.

Cool, Helen. 2016. *The Small Finds and Vessel Glass from Insula VI.1 Pompeii: Excavations 1995–2006* (Archaeopress Roman Archaeology, 17). Oxford: Archaeopress.

Cool, Helen, and Mike Baxter. 1999. Peeling the Onion: An Approach to Comparing Vessel Glass Assemblages. *Journal of Roman Archaeology* 12:72–100.

Corbier, Mireille. 1989. The Ambiguous Status of Meat in Ancient Rome. *Food and Foodways* 3(3):223–264. doi: 10.1080/07409710.1989.9961951.

Corbier, Mireille. 1999. The Broad Bean and the Moray: Social Hierarchies and Food in Rome. In *Food: A Culinary History From Antiquity to the Present*, edited by J.-L. Flandrin and Massimo Montanari, pp. 128–140. New York: Penguin.

Corridi, Claudio. 1990. Reperti alimentari. In *Archeologia urbana a Fiesole. Lo scavo di Via Marini—Via Portigiani*, edited by Giuliano De Marinis, pp. 335–338. Florence: Giunti.

Cossalter, Lara, and Maria Rosaria Depalo, eds. 2017. *Il paesaggio storico recostruito: L'insediamento di Piana San Felice a Gravina in Puglia*. Bari: Edipuglia.

Costantini, Lorenzo. 1983. Piante coltivate e piante spontanee a San Giovanni di Ruoti (Potenza). In *Lo scavo di San Giovanni di Ruoti ed il periodo tardoantico in Basilicata*, edited by M. Gualtieri, M. Salvatore, and A. Small, pp. 85–90. Bari: Adriatica.

Craig, O., M. Biazzo, T. O'Connell, P. Garnsey, C. Martinez-Labarga, R. Lelli, L. Salvadei, G. Tartaglia, A. Nava, and L. Renò. 2009. Stable Isotopic Evidence for Diet at the Imperial Roman Coastal Site of Velia (1st and 2nd centuries AD) in Southern Italy. *American Journal of Physical Anthropology* 139(4):572–583.

Craig, Oliver, Luca Bondioli, Luciano Fattore, Thomas Higham, and Robert Hedges. 2013. Evaluating Marine Diets through Radiocarbon Dating and Stable Isotope Analysis of Victims of the AD79 Eruption of Vesuvius. *American Journal of Physical Anthropology* 152(3):354–352. doi: doi:10.1002/ajpa.22352.

Crawford, Michael. 1970. Money and Exchange in the Roman World. *Journal of Roman Studies* 60:40–48.

Crawford, Michael. 1974. *Roman Republican Coinage*. Cambridge: Cambridge University Press.

Cremaschi, M., A.M. Mercuri, P. Torri, A. Florenzano, C. Pizzi, M. Marchesini, and A. Zerbonia. 2016. Climate Change Versus Land Management in the Po Plain (Northern Italy) during the Bronze Age: New Insights from the VP/VG Sequence of the Terramara Santa Rosa di Poviglio." *Quaternary Science Reviews* 136:153–172.

Cresswell, Tim. 2006. *On the Move: Mobility in the Modern Western World*. New York: Routledge.

Cristofani, Martina. 1977. Strutture insediative e modi di produzione. In *Caratteri dell'ellenismo nelle urne etrusche*, edited by Marina Martelli, pp. 74–80. Florence: Centro Di.

Crummy, Nina. 1983. *Colchester Archaeological Report 2: The Roman Small Finds from Excavations in Colchester 1971–9*. Colchester: Colchester Archaeological Trust.

Cuglia, Valeria, and Daniela Williams. 2007. Note sulla circolazione monetaria in età imperiale romana di alcuni siti dell'Etruria meridionale, Latium Vetus e Campania. In *Il forum di numismatica antica a Roma Tre. Studi e ricerche sul collezionismo, la circolazione e l'iconografia monetale*, edited by M. Molinari, pp. 163–212. Rome: Espera.

Cuomo di Caprio, Ninina. 2007. *Ceramica in archeologia 2. Antiche tecniche di lavorazione e moderni metodi di indagine*. Rome: L'Erma di Bretschneider.

Cuvigny, Helené. 1996. The Amount of Wages Paid to the Quarry-workers at Mons Claudianus. *Journal of Roman Studies* 86:139–145.

Cygielman, Mario. 1998. La villa romana di Nomadelfia. In *Roselle. Guida al parco archeologico*, edited by Francesco Nicosia and Gabriella Poggesi, pp. 172–174. Siena: Nuova Immagine.

Dall'Aglio, Pierluigi, ed. 2010. *Sistemi centuriali e opere di assetto agrario tra eta romana e primo medioevo: aspetti metodologici, ricostruttivi e interpretativi. Atti del convegno, Borgoricco (Padova–Lugo (Ravenna)10–12 settembre 2009)*. Pisa/Rome: Serra.

Davidson, Alastair. 1984. Gramsci, the Peasantry and Popular Culture. *Journal of Peasant Studies* 11(4):139–154. doi: 10.1080/03066158408438245.

Davies, R.W. 1971. The Roman Military Diet. *Britannia* 2:122–142.

De Benetti, Massimo. 2013. Rinvenimenti numismatici nel territorio di Roselle. In *Roselle. Le monete dagli scavi archeologici (1959–1991) e dal territorio*, edited by Massimo De Benetti and Fiorenzo Catalli, pp. 261–293. Grosseto: Ministero per i beni e le attività culturali.

De Benetti, Massimo. 2015. I reperti numismatici. In *Diana Umbronensis a Scoglietto. Santuario, Territorio e Cultura Materiale (200 a.C.–550 d.C.)*, edited by Alessandro Sebastiani, Elena Chirico, Matteo Colombini, and Mario Cygielman, pp. 244–278. Oxford: Archaeopress.

De Benetti, Massimo, and Fiorenzo Catalli, eds. 2013. *Roselle: le monete dagli scavi archeologici*

(1959–1991) e dal territorio. Grosseto: Ministero per i beni e le attività culturali.

De Boe, G. 1975. Villa romana in località 'Posta Crusta'. *Notizie degli Scavi di Antichità* 24:516–530.

De Grossi Mazzorin, Jacopo. 1987. 'La fauna' in La villa dei Quintili at Monteporzio. *Quaderni di Archeologia Etrusco-Italica* 8:234–235.

De Grossi Mazzorin, Jacopo, and C. Minniti. 2017. Changes in Lifestyle in Ancient Rome (Italy) across the Iron Age/Roman Transition. In *Oxford Companion to Zooarchaeology*, edited by U. Albarella, M. Rizzetto, H. Russ, and S. Viner-Daniels, pp. 127–146. Oxford: Oxford University Press.

De Marinis, Giuliano, ed. 1990. *Archeologia urbana a Fiesole: lo scavo di via Marini-via Portigiani*. Florence: Giunti.

De Tommaso, Giandomenico, and Gabriella Poggesi. 1985. Vetro. In *Settefinestre. Una villa schiavistica nell'Etruria romana. Vol. 3. La villa e suoi reperti*, edited by Andreina Ricci, pp. 173–211. Modena: Panini.

De Vries, Jan. 2008. *The Industrious Revolution: Consumer Behavior and the Household Economy, 1650 to the Present*. Cambridge: Cambridge University Press.

Degasperi, Angelica. 2003. La moneta nel Medio Valdarno Inferiore: osservazioni sulla circolazione monetaria tra Lucca e Pistoia fra alto- e basso medioevo. *Archeologia Medievale* 30:557–568.

Delor-Ahü, Anne, and Pierre Mathelart. 2014. La consummation alimentaire d'apres la céramique en Champagne: comparisons raisonnées etrne la capitale des Rèmes et son territoire. In *Consommer dans les campagnes de la Gaule romaine*, edited by Xavier Deru and R. González Villaescusa, pp. 193–217. Lille: Université Charles-de-Gaulle Lille 3.

Depeyrot, Georges. 1992. Le système monétaire de Dioclétien à la fin de l'Empire Romain. *Revue Belge de Numismatique* 138:33–106.

Derks, Ton, and Nico Roymans. 2002. Seal-boxes and the spread of Latin literacy in the Rhine Delta. In *Becoming Roman, Writing Latin? Literacy and Epigraphy in the Roman West*, edited by Alison Cooley, pp. 87–134. Portsmouth, RI: Journal of Roman Archaeology.

Deru, Xavier, and R. González Villaescusa, eds. 2014. *Consommer dans les campagnes de la Gaule romaine, Revue du Nord, 21*. Lille: Université Charles-de-Gaulle Lille 3.

Deschler-Erb, Eckhard. 1999. *Ad Arma! Römisches Militär des 1. Jahrhunderts n.Chr. in Augusta Raurica*. Augst: Römerstadt Augusta Raurica.

Di Matteo, F. 2005. Anguillara Sabazia (Roma) - località "Campo di Noce". Una fattoria nella ager Veientanus. *Fasti Online* 49. doi: http://www.fastionline.org/docs/FOLDER-it-2005-49.pdf.

Di Pasquale, Gaetano, Mauro Paolo Buonincontri, Emilia Allevato, and Antonio Saracino. 2014. Human-derived landscape changes on the northern Etruria coast (western Italy) between Roman times and the late Middle Ages. *The Holocene* 24(11):1491–1502. doi: https://doi.org/10.1177/0959683614544063.

Di Pasquale, Gaetano, Daniela Moser, Emilia Allevato, and Oliver Nelle. 2014. The Origins and Types of Timber and Other Woody Remains in the Villa. In *Oplontis: Villa A ("of Poppaea") at Torre Annunziata, Italy*, edited by John R. Clarke and Nayla K. Muntasser, pp. 1173–1206. New York: American Council of Learned Societies.

Di Pasquale, Gaetano, and Manola Terzani. 2006. Archeobotanica a Populonia: Primi risultati e prospettive della ricerca. In *Materiali per Populonia, 5*, edited by Manuela Aprosio and Cintia Mascione, pp. 283–291. Pisa: ETS.

Dicus, Kevin. 2014. Resurrecting Refuse at Pompeii: The Use-value of Urban Refuse and Its Implications for Interpreting Archaeological Assemblages. In *TRAC 2013: Proceedings of the Twenty-Third Annual Roman Theoretical Archaeology Conference*, edited by Hannah Platts, John Pearce, Caroline Barron, Jason Lundock, and Justin Yoo, pp. 65–78. Oxford: Oxbow.

Dimbleby, Geoffrey. 1985. *The Palynology of Archaeological Sites*. London: Academic Press.

Dobres, Marcia-Anne. 2000. *Technology and Social Agency: Outlining a Practice Framework for Archaeology*. Oxford: Blackwell.

Dommelen, Peter van, and Nicola Terrenato. 2007. Introduction: Local Cultures and the Expanding Roman Republic. In *Articulating Local Cultures: Power and Identity under the Expanding Roman Republic*, edited by Peter van Dommelen. Portsmouth, RI: Journal of Roman Archaeology.

Doneus, M., G. Verhoeven, M. Fera, C. Briese, M. Kucera, and W. Neubauer. 2011. From Deposit to Point Cloud: A Study of Low-cost Computer Vision Approaches for the Straightforward

Documentation of Archaeological Excavation. In *XXIIIrd International CIPA Symposium*, pp. 81–88. Prague: České vysoké učení technické v Praze.

Dossey, Leslie. 2010. *Peasant and Empire in Christian North Africa*. Berkeley: University of California Press.

Drachmann, Aage Gerhardt. 1932. *Ancient Oil Mills and Presses*. Copenhagen: Levin & Munksgaard.

Drennan, Robert. 1988. Household Location and Compact versus Dispersed Settlement in Prehispanic Mesoamerica. In *Household and Community in the Mesoamerican Past: Case Studies in the Maya Area and Oaxaca, Chapter: Prehispanic Chiefdoms in the Valle de la Plata, Vol. 1: The Environmental Context of Human Habitation*, edited by Richard R. Wilk and Wendy Ashmore, pp. 273–293. Albuquerque: University of New Mexico Press.

Dreßler, Mirko, Uwe Selig, Walter Dörfler, Sven Adler, Hendrik Schubert, and Thomas Hübener. 2006. Environmental Changes and the Migration Period in Northern Germany as Reflected in the Sediments of Lake Dudinghausen. *Quaternary Research* 66(1):25–37.

Driesch, A. von den. 1976. *A Guide to the Measurement of Animal Bones from Archaeological Sites*. Cambridge, MA: Peabody Museum of Archaeology and Ethnology.

Driggers, Ronald, ed. 2003. *Encyclopedia of Optical Engineering*. New York: Marcel Dekker.

Duby, Georges. 1962. *L'économie rurale et la vie des campagnes dans l'occident médiéval (France, Angleterre, Empire, IX–XV siècles): essai de synthèse et perspectives de recherches*. Paris: Aubier.

Duby, Georges. 1973. *Guerriers et paysans, VII–XIIe siècle; premier essor de l'économie européenne*. Paris: Gallimard.

Dudd, S., M. Regert, and Richard Evershed. 1998. Assessing Microbial Lipid Contributions during Laboratory Degradations of Fats and Oils Pure Triacylglycerols Absorbed in Ceramic Potsherds. *Organic Geochemistry* 29(5–7):345–354.

Duncan-Jones, Richard. 1976. Some Configurations of Landholding in the Roman Empire. In *Studies in Roman Property*, edited by M.I. Finley, pp. 7–34. Cambridge: Cambridge University Press.

Duncan-Jones, Richard. 1982. *The Economy of the Roman Empire. Quantitative Studies*. 2nd ed. Cambridge: Cambridge University Press.

Durham, Peter, and J.J. Hawthorne. 1999. Quantifying Shape: African Red Slip Ware and Eating Habits. In *Archaeology in the Age of the Internet. CAA97. Computer Applications and Quantitative Methods in Archaeology*, edited by L. Dingwall, S. Exon, V. Gaffney, S. Laflin, and M. van Leusen, 280-1–280-4. Oxford: Archaeopress.

Duvernoy, S., and Gabriella Poggesi. 1998. L'anfiteatro. In *Roselle. Guida al parco archeologico*, edited by Francesco Nicosia and Gabriella Poggesi, pp. 75–81. Siena: Nuova Immagine.

Dyer, Christopher. 1989. *Standards of Living in the Later Middle Ages: Social Change in England, c.1200–1520*. Cambridge: Cambridge University Press.

Dyson, Stephen. 1976. *Cosa: The Utilitarian Pottery*. Rome: American Academy in Rome.

Dyson, Stephen. 1978. Settlement Patterns in the *Ager Cosanus*: The Wesleyan University Survey, 1974–1976. *Journal of Field Archaeology* 5(3):251–268.

Dyson, Stephen. 1981. A Classical Archaeologist's Response to the 'New Archaeology'. *Bulletin of the American Schools of Oriental Research* 242:7–13.

Dyson, Stephen. 1993. From New to New Age Archaeology: Archaeological Theory and Classical Archaeology. A 1990s Perspective. *American Journal of Archaeology* 97(2):195–206.

Ellis, Simon. 2000. *Roman Housing*. London.

Ellis, Steven. 2017. Re-evaluating Pompeii's Coin Finds. Monetary Transactions and Urban Waste in the Retail Economy of an Ancient City. In *The Economy of Pompeii*, edited by Miko Flohr and Andrew Wilson, pp. 293–338. Oxford: Oxford University Press.

Ellis, Steven, and Gary Devore. 2007. Uncovering Plebeian Pompeii: Broader Implications from Excavating a Forgotten Working-class Neighbourhood. In *Nuove ricerche archeologiche nell'area Vesuviana (scavi 2003–2006)*, edited by Piero Guzzo and Maria Paola Guidobaldi, pp. 309–320. Rome: L'Erma de Bretschneider.

Erdkamp, Paul. 2008. Mobility and Migration in Italy in the Second Century BC. In *People, Land, and Politics: Demographic Developments and the Transformation of Roman Italy 300 BC–AD 14*, edited by L. de Ligt and S. Northwood, pp. 417–450. Leiden: Brill.

Erdkamp, Paul. 2015. Agriculture, Division of Labor and the Paths to Economic Growth. In *Ownership and Exploitation of Land and Natural Resources in*

the Roman World, edited by Paul Erdkamp, Koenraad Verboven, and Arjan Zuiderhoek, pp. 18–39. Oxford: Oxford University Press.

Erdkamp, Paul, Koenraad Verboven, and Arjan Zuiderhoek, eds. 2015. *Ownership and Exploitation of Land and Natural Resources in the Roman World*. Oxford: Oxford University Press.

Ettlinger, Elisabeth, ed. 1990. *Conspectus Formarum Terrae Sigillatae Italico Modo Confectae*. Bonn: Rudolf Habelt GMBH.

Evans, Christopher, and Craig Cessford. 2015. North West Cambridge: Archaeology, Art and Mud. *British Archaeology* March–April:34–39.

Evans, Jane. 2013. Coins and the Archaeology of the Roman Republic. In *Companion to the Archaeology of the Roman Republic*, edited by Jane Evans, pp. 110–122. Malden, MA: Wiley-Blackwell.

Evans, J.K. 1981. Wheat Production and Its Social Consequences in the Roman World. *Classical Quarterly* 31(2):428–442.

Evershed, Richard. 2008. Organic Residues in Archaeology: The Archaeological Biomarker Revolution. *Archaeometry* 50(6):895–924.

Facella, Antonio. 2004. *Vada Volaterrana. I rinvenimenti monetali dagli horrea in località S. Gaetano (Rosignano Marittimo, Livorno)*.Pisa: Plus.

Fairén Jiménez, Sara. 2004. ¿Se hace camino al andar? Influencia de las variables medioambientales y culturales en el cálculo de caminos óptimos mediante SIG. *Trabajos de Prehistoria* 61:25–40.

FAO. 1976. *A Framework for Land Evaluation*, *FAO Soils Bulletin 32*. Rome: FAO.

FAO. 2006. *World Reference Base for Soil Resources*, *World Soil Resources Report No. 103*. Rome: FAO.

Farinelli, Roberto. 2007. *I castelli nella toscana delle "città deboli". Dinamiche del popolamento e del potere rurale nella Toscana meridionale (secoli VII–XIV)*. Florence: All'insegna del Giglio.

Favory, François, J.-J. Girardot, and M.P. Zannier. 1995. La perception des sols et des plantes chez les agronomes romains. In *The Archaeomedes Project: Understanding the Natural and Anthropogenic Causes of Soil Degradation and Desertification in the Mediterranean Basin*, edited by Sander van der Leeuw, pp. 73–114. Luxembourg: Office for Official Publications of the European Communities.

Favory, François, and Claude Raynaud. 2000. Définition ou hièrarchisation des sites? Approche intégrée en Gaule Méditerranénne. In *Non-destructive Techniques Applied to Landscape Archaeology*, edited by M. Pasquinucci and F. Trément, pp. 223–232. Oxford: Oxbow.

Favory, François, and Anne Vignot, eds. 2003. *Actualité de la recherche en histoire et archéologie agraires. Actes du colloque AGER V*. Besançon: Presses universitaires franc-comtoises.

Felici, Cristina. 2004. *Carta archeologica della provincia di Siena, Vol. VI, Pienza*. Siena: Nuova Immagine.

Fentress, Elizabeth. 2000. What Are We Counting For? In *Extracting Meaning From Ploughsoil Assemblages*, edited by Riccardo Francovich, Helen Patterson, and Graeme Barker, pp. 44–52. Oxford: Oxbow.

Fentress, Elisabeth. 2001. Villas, Wine and Kilns: The Landscape of Jerba in the late Hellenistic Period. *Journal of Roman Archaeology* 14:249–268.

Fentress, Elisabeth, ed. 2004. *Cosa V: An Intermittent Town, Excavations 1991–1997* (Memoirs of the American Academy in Rome Supplementary Series). Ann Arbor: University of Michigan Press.

Fentress, Elizabeth. 2009. Peopling the Countryside: Roman Demography in the Albegna Valley and Jerba. In *Quantifying the Roman Economy. Methods and Problems*, edited by A. Bowman and A. Wilson, pp. 127–174. Oxford: Oxford University Press.

Fentress, Elisabeth, and Phil Perkins. 2016. Cosa and the *Ager Cosanus*. In *A Companion to Roman Italy*, edited by Alison Cooley, pp. 378–400. Malden, MA: Wiley-Blackwell.

Ferdière, Alain. 2009. Recherche sur les contextes de découverte d'outillage agricole et objets liés au travail et à la production rurale en Gaule romaine. In *Les formes de l'habitat rural gallo-romain. Colloque AGER VIII*, edited by Philippe Leveau, Claude Raynaud, Robert Sablayrolles, and Frédéric Trément, pp. 81–107. Bordeaux: Fédération Aquitania.

Ferdière, Alain. 2015. Essai de typologie des greniers ruraux de Gaule du Nord. *Revue archéologique du Centre de la France* 54. doi: http://journals.openedition.org/racf/2294.

Feugère, Michel. 2002. Le mobilier militaire romain dans le Département de l'Hérault. *Gladius* 22:73–126.

Feugère, Michel. 2009. Militaria, objets en os et en métal. In *Le camp de la flotte d'Agrippa à Fréjus:*

Les fouilles du Quartier de Villeneuve (1979–1981), edited by Charles Goudineau and Daniel Brentchaloff, pp. 107–177. Paris: Errance.

Feugère, Michel. 2010. The Artefacts Project : An Encyclopedia of Archaeological Small Finds. *Lucerna* 39:4–6. http://artefacts.mom.fr/Publis/Lucerna.pdf.

Finke, Peter, Jenny Harding, Jan Sevink, Rene Sewuster, and Simon Stoddart. 1994. The Dissection of a Bronze and Early Iron Age Landscape. In *Territory, Time and State: The Archaeological Development of the Gubbio Basin*, edited by Caroline Malone and Simon Stoddart, pp. 81–93. Cambridge: Cambridge University Press.

Finley, Moses. 1973. *The Ancient Economy*. Berkeley: University of California Press.

Finley, Moses. 1999. *The Ancient Economy*. 3rd ed. Berkeley University of California Press.

Fitzjohn, Matthew. 2007. Viewing Places: GIS Applications for Examining the Perception of Space in the Mountains of Sicily. *World Archaeology* 39(1):36–50.

Flohr, Miko. 2017. Quantifying Pompeii: Population, Inequality and the Urban Economy. In *The Economy of Pompeii*, edited by Miko Flohr and Andrew Wilson, pp. 53–84. Oxford: Oxford University Press.

Florenzano, Assunta, Silvia Benassi, and Anna Maria Mercuri. 2012. Pioggia pollinica e qualità dell'aria: polline di Olea negli uliveti dal caso studio della regione Basilicata (sud Italia). *Atti della Società dei Naturalisti e Matematici di Modena* 142:175–189.

Florenzano, Assunta, Michela Marignani, Leonardo Rosati, Simonetta Fascetti, and Anna Maria Mercuri. 2014. Are Cichorieae an Indicator of Open Habitats and Pastoralism in Current and Past Vegetation Studies? *Plant Biosystems* 149(1):154–165. doi: 10.1080/11263504.2014.998311.

Florenzano, Assunta, Anna Maria Mercuri, Aurora Pederzoli, Paola Torri, Giovanna Bosi, Linda Olmi, Rossella Rinaldi, and Marta Bandini Mazzanti. 2012. The Significance of Intestinal Parasite Remains in Pollen Samples from Mediaeval Pits in the Piazza Garibaldi of Parma, Emilia Romagna, Northern Italy. *Geoarchaeology* 27(1):34–47.

Florenzano, Assunta, Anna Maria Mercuri, Rossella Rinaldi, Eleonora Rattighieri, Rita Fornaciari, Rita Messora, and Laura Arru. 2017. The Representativeness of Olea Pollen from Olive Groves and the Late Holocene Landscape Reconstruction in Central Mediterranean. *Frontiers in Earth Science* 5:85. doi: 10.3389/feart.2017.00085.

Floud, Roderick, Robert W. Fogel, Bernard Harris, and Sok Chul Hong. 2011. *The Changing Body: Health, Nutrition and Human Development in the Western World since 1700*. Cambridge: Cambridge University Press.

Flower, Harriet. 1996. *Ancestor Masks and Aristocratic Power in Roman Culture*. Oxford: Oxford University Press.

Fontana, Sergio. 1998. Le "imitazioni" della sigillata africana e le ceramiche da mensa italiche tardo-antiche. In *Ceramica in Italia: VI–VII secolo*, edited by Lucia Saguì, pp. 83–100. Florence: All'Insegna del Giglio.

Fontana, Sergio. 2005. Le ceramiche da mensa italiche medio-imperiali e tardo-antiche: imitazioni di prodotti importati e tradizione manifatturiera locale. In *La ceramica e i materiali di Età Romana. Classi, produzioni, commerci e consumi*, edited by Daniela Gandolfi, pp. 259–278. Bordeaux: Istituto internazionale di studi liguri.

Forbes, Hamish. 2000a. Dowry and Inheritance: Their Relationship to Land Fragmentation and Risk Reduction on Methana. In *Contingent Countryside: Settlement, Economy and Land Use in the Southern Argolid Since 1700*, edited by Susan Buck Sutton, pp. 200–227. Stanford, CA: Stanford University Press.

Forbes, Hamish. 2000b. The Agrarian Economy of the Ermoinidha around 1700: An Ethnohistorical Reconstruction. In *Contingent Countryside: Settlement, Economy and Land Use in the Southern Argolid Since 1700*, edited by Susan Buck Sutton, pp. 41–70. Stanford, CA: Stanford University Press.

Forbes, Hamish. 2007. *Meaning and Identity in a Greek Landscape: An Archaeological Ethnography*. Cambridge: Cambridge University Press.

Forbes, Hamish, and Lynn Foxhall. 1995. Ethnoarchaeology and Storage in the Ancient Mediterranean: Beyond Risk and Survival. In *Food in Antiquity*, edited by John Wilkins, F.D. Harvey, and Mike Dobson, pp. 69–86. Exeter: University of Exeter Press.

Formicola, Vicenzo. 1993. Stature Reconstruction from Long Bones in Ancient Population Samples: An Approach to the Problem of Its Reliability.

American Journal of Physical Anthropology 90:351–358.

Foxhall, Lynn. 1990. The Dependent Tenant: Land, Leasing and Labour in Italy and Greece. *Journal of Roman Studies* 80:97–114.

Foxhall, Lynn. 2000. The Running Sands of Time: Archaeology and the Short Term. *World Archaeology* 31(3):484–498.

Foxhall, Lynn, and Hamish Forbes. 1982. Sitometreia: The Role of Grain as a Staple Food in Classical Antiquity. *Chiron* 12:41–90.

Fracchia, Helen. 2006. Middle to Late Imperial Ceramic Production and Evolution in the Southeastern Val di Chiana. In *Old Pottery in a New Century: Innovating Perspectives on Roman Pottery Studies*, edited by Daniele Malfitana, Jerome Poblome, and John Lund, pp. 125–137. Rome: L'Erma di Bretschneider.

Francovich, R., S. Campana, and C. Felici. 2005. Large Scale Magnetic Survey and Archaeological Mapping: The Grosseto and Siena Projects. In *Proceedings of the 6th International Conference on Archaeological Prospection* pp. 25–30. Rome: Institute of Technologies Applied to Cultural Heritage.

Francovich, Riccardo, Sauro Gelichi, and Roberto Parenti. 1980. *Aspetti e problemi di forme abitative minori : attraverso la documentazione materiale nella Toscana medievale*. Florence: All'Insegna del Giglio.

Francovich, Riccardo, Helen Patterson, and Graeme Barker, eds. 2000. *Extracting Meaning from Ploughsoil Assemblages*. Oxford: Oxbow.

Frank, Tenney. 1920. *An Economic History of Rome to the End of the Republic*. Baltimore: Johns Hopkins Press.

Frank, Tenney. 1924. Roman Census Statistics from 225 to 28 B.C. *Classical Philology* 19:329–341.

Frayn, Joan. 1979. *Subsistence Farming in Roman Italy*. Fontwell, Sussex: Centaur Press.

Frayn, Joan. 1993. *Markets and Fairs in Roman Italy: Their Social and Economic Importance from the Second Century BC to the Third Century AD*. Oxford: Oxford University Press.

Freed, Joann. 1983. Pottery from the Late Middens at San Giovanni. In *Lo scavo di San Giovanni di Ruoti ed il periodo tardoantico in Basilicata*, edited by M. Gualtieri, M. Salvatore, and A. Small, pp. 91–106. Rome: Bari.

Frézouls, Edmond, ed. 1988. *La mobilité sociale dans le monde romain, Contributions et travaux de l'Institut d'histoire romaine, 5*. Strasbourg: AECR.

Friedmann, Harriet. 1980. Household Production and the National Economy: Concepts for the Analysis of Agrarian Formation. *Journal of Peasant Studies* 7(2):158–184.

Frier, Bruce. 2000. Demography. In *The Cambridge Ancient History. Vol. 11. The High Empire, A.D. 70–192*, edited by Alan Bowman, Peter Garnsey, and Dominic Rathbone, pp. 787–816. Cambridge: Cambridge University Press.

Fülle, Gunnar. 1997. The Internal Organization of the Arretine Terra Sigillata Industry: Problems of Evidence and Interpretation. *Journal of Roman Studies* 87:111–155.

Fuller, Dorian. 2005. Ceramics, Seeds and Culinary Change in Prehistoric India. *Antiquity* 79(306):761–777.

Fumo, Antonia. 2010. Le ceramiche rivestite di rosso della villa di Aiano-Torraccia di Chiusi (San Gimignano, Siena): uno studio archeologico e archeometrico. *FOLD&R Fasti Online* 148:1–37. doi: http://www.fastionline.org/docs/FOLDER-it-2010-178.pdf.

Fustel du Coulanges, Numa. 1864. *Le cité antique*. Paris: Durand.

Gadd, David. 1986. The Roman Farmstead at Site 9, subsection of C. Delano Smith, D. Gadd, N. Mills, and B. Ward-Perkins, Luni and the *Ager Lunensis*: The Rise and Fall of a Roman Town and Its Territory. *Papers of the British School at Rome* 54:109–118.

Gagé, Jean. 1964. *Les classes sociales dans l'Empire romain*. Paris: Payot.

Gaggio, Dario. 2017. *The Shaping of Tuscany. Landscape and Society between Tradition and Modernity*. Cambridge: Cambridge University Press.

Gaitzsch, Wolfgang. 1980. *Eiserne Römische Werkzeuge. Studien zur römischen Werkzeugkunde in Italien und den nördlichen Provinzen des Imperium romanum, BAR International Series, 78*. Oxford: British Archaeological Reports.

Gallant, Thomas. 1991. *Risk and Survival in Ancient Greece*. Stanford: Stanford University Press.

Gargola, Daniel. 2008. The Gracchan Reform and Appian's Representation of an Agrarian Crisis. In *People, Land and Politics: Demographic Developments and the Transformation of Roman Italy*

300 BC–AD 14, edited by Luk de Ligt and Simon Northwood, pp. 487–518. Leiden: Brill.

Garnsey, Peter. 1976. Peasants in Ancient Roman Society. *Journal of Peasant Studies* 3(2):221–235.

Garnsey, Peter. 1979. Where did Italian Peasants Live? *Proceedings of the Cambridge Philological Society* 205, n.s. 25:1–25.

Garnsey, Peter. 1988. *Famine and Food Supply in the Graeco-Roman World. Responses to Risk and Crisis*. Cambridge: Cambridge University Press.

Garnsey, Peter. 1999. *Food and Society in Classical Antiquity*. Cambridge: Cambridge University Press.

Gates-Foster, Jennifer. 2012. The Well-remembered Path: Roadways and Cultural Memory in Ptolemaic and Roman Egypt. In *Highways, Byways, and Road Systems in the Pre-Modern World*, edited by Susan Alcock, John Bodel, and J.A. Talbert, pp. 202–221. Chichester, UK: Wiley-Blackwell.

Gault, Anthony. 1979. Exploring the Cultural Ecology of Field Fragmentation and Scattering on the Island of Pantelleria, Italy. *Journal of Anthropological Research* 35(1):93–108.

Geel, Bas van. 1986. Application of Fungal and Algal Remains and Other Microfossils in Palynological Analyses. In *Handbook of Holocene Palaeoecology and Palaeohydrology*, edited by B.E. Berglund, pp. 497–505. Chichester: Wiley.

Geel, Bas van. 2001. Non-pollen Palynomorphs. In *Tracking Environmental Change Using Lake Sediments. Volume 3: Terrestrial, Algal and Siliceaous Indicators*, edited by J.P. Smol, H. John Birks, and William Last, pp. 99–119. Dordrecht: Kluwe.

Geel, Bas van, J. Buurman, O. Brinkkemper, J. Schelvis, A. Aptroot, G. van Reenen, and T. Hakbijl. 2003. Environmental Reconstruction of a Roman Period Settlement Site in Uitgeest (The Netherlands), with Special Reference to Coprophilous Fungi. *Journal of Archaeological Science* 30:873–883.

Gentry, Anne. 1976. *Roman Military Stone-Built Granaries in Britain*. Oxford: British Archaeological Reports.

Gering, Alex. 2013. Ruins, Rubbish Dumps and Encroachment: Resurveying Late Antique Ostia. In *Field Methods and Post-Excavation Techniques in Late Antique Archaeology*, edited by Luke Lavan and Michael Mulryan, pp. 249–288. Leiden: Brill.

Ghisleni, Mariaelena. 2009. Il sito di Santa Marta nel contesto delle dinamiche insediative di età romana, tardo antica e medievale della media valle dell'Ombrone (Cinigiano-GR). In *V Congresso Nazionale di Archeologia Medievale*, edited by Giuliano Volpe and Pasquale Favia, pp. 247–249. Florence: All'Insegna del Giglio.

Ghisleni, Mariaelena. 2010. Carta archeologica della provincia di Grosseto: Comune di Cinigiano. Dinamiche insediative e di potere fra V e XI secolo nella bassa val d'Orcia e nella media valle dell'Ombrone. Ph.D. diss., Università di Siena.

Ghisleni, Mariaelena, Emanuele Vaccaro, and Kim Bowes. 2011. Excavating the Roman Peasant I: Excavations at Pievina. *Papers of the British School at Rome* 79:95–145.

Gianecchini, Monica, and Jacopo Moggi-Cecchi. 2008. Stature in Archeological Samples from Central Italy: Methodological Issues and Diachronic Changes. *American Journal of Physical Anthropology* 135(3):284–292.

Giardina, Andrea, and Aldo Schiavone, eds. 1981. *Società romana e produzione schiavistica* 3 vols. Bari: Edipuglia.

Gibson, Erin. 2007. The Archaeology of Movement in a Mediterranean Landscape. *Journal of Mediterranean Archaeology* 20:61–87.

Ginsborg, Paul. 2003. *A History of Contemporary Italy: Society and Politics 1943–1980*. London: Penguin.

Giorgetti, A., and G. Campodoni. 1985. La documentazione archeozoologica. In *L'antico palazzo de Vescovi a Pistoia II. Indagini archeologiche*, edited by Guido Vannini, pp. 545–558. Florence: Leo S. Olschki.

Giorgetti, Giorgio. 1983. Le crete senesi nell'età moderna : studi e ricerche di storia rurale. Florence: Leo S. Olschki.

Giovinazzo, Rosanna 1998. I reperti faunistici. In *Filattiera-Sorano: L'insediamento di età romana e tardo antica scavi 1986–1995*, edited by Erico Giannichedda, pp. 196–197 (Archeologia nell'antica diocesi di Luni, 1). Florence: All'insegna del giglio.

Given, Michael. 2013. Commotion, Collaboration, Conviviality: Mediterranean Survey and the Interpretation of Landscape. *Journal of Mediterranean Archaeology* 26:3–26.

Given, Michael, and Marios Hadjianastasis. 2010. Landholding and Landscape in Ottoman Cyprus. *Byzantine and Modern Greek Studies* 34(1):38–60.

Given, Michael, Bernard Knapp, and Dina Coleman, eds. 2003. *The Sydney Cyprus Survey Project: Social Approaches to Regional Archaeological Survey* (Monumenta Archaeologica, 21). Los Angeles: Cotsen Institute of Archaeology, University of California.

Goldsmith, Raymond. 1984. An Estimate of the Size and Structure of the National Product of the Early Roman Empire. *Review of Income and Wealth* 30:263–288.

Goodchild, Helen. 2007. Modelling Roman Agricultural Production in the Middle Tiber Valley, Central Italy. Ph.D. diss., University of Birmingham.

Goodchild, Helen. 2013. GIS Models of Roman Agricultural Production. In *The Roman Agricultural Economy: Organization, Investment and Production*, edited by Alan Bowman and Andrew Wilson, pp. 55–83. Oxford: Oxford University Press.

Gori-Montanelli, Lorenzo. 1964. *Architettura rurale in toscana*. Florence: Editrice Edam.

Gould, Peter. 2018. *Empowering Communities through Archaeology and Heritage: The Role of Local Governance in Economic Development*. London: Bloomsbury.

Graeber, David. 2011. Consumption. *Current Anthropology* 52:489–511.

Gramsci, Antonio. 1920. Operai e contadini. *L'ordine nuovo* 3 January.

Grant, Annie. 1982. The Use of Tooth Wear as a Guide to the Age of Domestic Ungulates. In *Ageing and Sexing Animal Bones from Archaeological Sites*, edited by Bob Wilson, pp. 91–108. Oxford: British Archaeological Reports.

Green, Talbot. 1979. A Tilemakers' Workshop at Itchingfield—A Reappraisal. In *Roman Brick and Tile. Studies in Manufacture, Distribution and Use in the Western Empire*, edited by Alan McWhirr, pp. 191–200. Oxford: British Archaeological Reports.

Greenacre, Michael. 2007. *Correspondence Analysis in Practice*. Boca Raton, FL: Chapman and Hall/CRC.

Greenblatt, Stephen. 2011. *The Swerve: How the World Became Modern*. New York: W.W. Norton.

Greene, Kevin. 1986. *The Archaeology of the Roman Economy*. London: B.T. Batsford.

Grenfell, Hugh. 1995. Probable Fossil Zygnematacean algal Spore Genera. *Review of Palaeobotany and Palynology* 84(3–4):201–220.

Grey, Cam. 2004. Letters of Recommendation and the Circulation of Rural Laborers in the Late Roman West. In *Travel, Communication, and Geography in Late Antiquity*, edited by Linda Ellis and Frank Kidner, pp. 25–40. Aldershot, UK: Ashgate.

Grey, Cam. 2011. *Constructing Communities in the Late Roman Countryside*. Cambridge: Cambridge University Press.

Grey, Cam. 2012. Concerning Rural Matters. In *Oxford Handbook of Late Antiquity*, edited by S. Johnson, pp. 625–666. Oxford: Oxford University Press.

Grey, Cam. 2019. Climate Change and Agrarian Change between the Fourth and Sixth Centuries: Questions of Scale, Coincidence, and Causality. In *Shifting Frontiers in Late Antiquity 12: The Fifth Century*, edited by Noel Lenski and Jan Willem Drjvers, pp. 35–48. Bari: Edipuglia.

Grey, Cam, James Mathieu, Antonia Arnoldus-Huyzendveld, Andrea Patacchini, and Mariaelena Ghisleni. 2015. Familiarity, Repetition, and Quotidian Movement in Roman Tuscany. *Journal of Mediterranean Archaeology* 28(2):195–219.

Grimm, Eric. 2004. *TILIA and TGView*. Springfield, IL: Illinois State Museum.

Groot, Maaike, Stijn Heeren, Laura Kooistra, and Wouter Vos. 2009. Surplus Production for the Market? The Agrarian Economy in the Non–villa Landscapes of Germania Inferior. *Journal of Roman Archaeology* 22:231–253.

Groot, Maaike, and Laura Kooistra. 2009. Land Use and the Agrarian Economy in the Roman Dutch River Area. *Internet Archaeology* 27. doi: https://doi.org/10.11141/ia.27.5.

Guash-Jané, Maria Rosa, Maite Iberno Gómez, Cristina Andrés-Lacueva, Olga Jáuregui, and Rosa Maria Lamuela-Raventós. 2004. Liquid Chromatography with Mass Spectrometry in Tandem Mode Applied for the Identification of Wine Markers in Residues from Ancient Egyptian Vessels. *Analytical Chemistry* 26(6):672–677.

Guerrini, Giuseppe, ed. 1999. *Torri e castelli della provincia di Grosseto*. Siena: Nuova Immagine.

Haas, Tymon de, ed. 2011. *Fields, Farms and Colonists: Intensive Field Survey and the Early Roman Colonization in the Pontine Region, Central Italy*. 2 vols. Groningen: Barkuis.

Haas, T. de. 2012. Beyond Dots on the Map: Intensive Survey Data and the Interpretation of Small Sites and Off-site Distributions. In *Comparative Issues*

in the Archaeology of the Roman Rural Landscape: Site Classification between Survey, Excavation and Historical Categories, edited by Peter Attema and Günther Schörner, pp. 55–79. Portsmouth, RI: Journal of Roman Archaeology.

Haldon, John, Hugh Elton, Sabine Huebner, Adam Izdebski, Lee Mordechai, and Timothy Newfield. 2018. Plagues, Climate Change, and the End of an Empire: A Response to Kyle Harper's *The Fate of Rome* (1): Climate. *History Compass* 16(12):e12508. doi: https://doi.org/10.1111/hic3.12508.

Hales, Shelley. 2003. *The Roman House and Social Identity*. Cambridge: Cambridge University Press.

Hall, Valerie. 1989. A Comparison of Grass Foliage, Moss Polsters and Soil Surfaces as Pollen Traps in Modern Pollen Studies. *Circaea* 6(1):63–69.

Halstead, Paul. 1987. Traditional and Ancient Rural Economy in Mediterranean Europe: Plus ça change? *Journal of Hellenic Studies* 107:77–87.

Halstead, Paul. 2014. *Two Oxen Ahead: Pre-Mechanized Farming in the Mediterranean*. Malden, MA: Wiley Blackwell.

Halstead, Paul, Paul Collins, and Valasia Isaakidou. 2002. Sorting the Sheep from the Goats: Morphological Distinctions between the Mandibles and Mandibular Teeth of Adult *Ovis* and *Capra*. *Journal of Archaeological Science* 29:545–553.

Hansen, Annette, and Frits Heinrich. 2019. Pulses. In *Diet and Nutrition in the Roman World*, edited by Paul Erdkamp and Claire Holleran, pp. 116–128. London: Routledge.

Hard, Robert, and William Merrill. 1992. Mobile Agriculturalists and the Emergence of Sedentism: Perspectives from Northern Mexico. *American Anthropologist* 94(3):601–620.

Harl, Kenneth. 2015. From Aurelian to Diocletian: Financing Imperial Recovery by Coinage Debasements and Fiduciary Currencies. In *Money in the Pre-Industrial World: Bullion, Debasements and Coin Substitutes*, edited by John Munro, pp. 33–44. London: Routledge.

Harper, Kyle. 2011. *Slavery in the Late Roman World, AD 275–425*. Cambridge: Cambridge University Press.

Harper, Kyle. 2017. *The Fate of Rome: Climate, Disease and the End of an Empire*. Princeton: Princeton University Press.

Harris, Lindsay. forthcoming. *Building a Modern Nation: Photography and Primitivism in Italy*. New Haven: Yale University Press.

Harris, William V. 1971. *Rome in Etruria and Umbria*. Oxford: Oxford University Press.

Harris, William V. 2006. A Revisionist View of Roman Money. *Journal of Roman Studies* 96:1–24.

Harris, William V. 2007. The Late Republic. In *Cambridge Economic History of the Greco-Roman World*, edited by Walter Scheidel, Ian Morris, and Richard Saller, pp. 511–539. Cambridge: Cambridge University Press.

Harris, William V. 2008. The Nature of Roman Money. In *The Monetary Systems of the Greeks and the Romans*, edited by William V. Harris, pp. 242–266. Oxford: Oxford University Press.

Harris, William V. 2011. Poverty and Destitution in the Roman Empire. In *Rome's Imperial Economy. Twelve Essays*, pp. 27–54. Oxford: Oxford University Press.

Harris, William V. 2013a. Defining and Detecting Mediterranean Deforestation, 80BC to 700CE. In *The Ancient Mediterranean Environment between Science and History*, edited by W. Harris, pp. 173–194. Leiden: Brill.

Harris, William V., ed. 2013b. *Moses Finley and Politics* (Columbia Studies in the Classical Tradition, 40). Leiden: Brill.

Harriss, John, ed. 1982. *Rural Development: Theories of the Peasant Economy and Agrarian Change*. London: Routledge.

Harvey, Sarah. 2010. Iron Tools from a Roman Villa at Boscoreale, Italy, in the Field Museum and the Kelsey Museum of Archaeology. *American Journal of Archaeology* 114(4):697–714.

Haselgrove, Colin, and Stefan Krmnicek. 2012. The Archaeology of Money. *Annual Review of Anthropology* 41:235–250.

Haselgrove, Colin, Martin Millett, and Ian Smith, eds. 1985. *Archaeology from the Ploughsoil. Studies in the Collection and Interpretation of Field Survey Data*. Sheffield: J.R. Collis.

Hayes, John W. 1972. *Late Roman Pottery*. London: British School at Rome.

Heinrich, Frits. 2019. Cereals and Bread. In *The Routledge Handbook of Diet and Nutrition in the Roman World*, edited by Paul Erdkamp and Claire Holleran, pp. 101–115. London: Routledge.

Heinrich, Frits, and Paul Erdkamp. 2017. The Role of Modern Malnutrition in Modelling Roman

Malnutrition: Aid or Anachronism? *Journal of Archaeological Science: Reports* 19:1016–1022. doi: https://doi.org/10.1016/j.jasrep.2017.06.011.

Helen, Tapio. 1975. *Organization of Roman Brick Production in the First and Second Centuries A.D.: An Interpretation of Roman Brick Stamps*. Helsinki: Suomalainen Tiedeakatemia.

Hill, M.O. 1974. Correspondence Analysis: A Neglected Multivariate Method. *Journal of the Royal Statistical Society. Series C (Applied Statistics)* 23(3):340–354.

Hillner, Julia. 2003. Domus, Family and Inheritance: The Senatorial Family House in Late Antique Rome. *Journal of Roman Studies* 93:129–145.

Hilton, Rodney. 1975. *The English Peasantry in the Later Middle Ages*. Oxford: Oxford University Press.

Hin, Saskia. 2013. *The Demography of Roman Italy: Population Dynamics in an Ancient Conquest Society 201 BCE–14 CE*. Cambridge: Cambridge University Press.

Hinds, Katie. 2017. HAMP-BADF2E: A Roman Lock. *Portable Antiquities Scheme*. doi: https://finds.org.uk/database/artefacts/record/id/855425.

Hingley, Richard. 2005. *Globalizing Roman Culture: Unity, Diversity and Empire*. London: Routledge.

Hitchner, W. Bruce. 2012. Roads, Integration, Connectivity, and Economic Performance in the Roman Empire. In *Highways, Byways, and Road Systems in the Pre-Modern World*, edited by Susan Alcock, John Bodel, and Richard Talbert, pp. 222–234. Malden, MA: Wiley-Blackwell.

Hjelle, Kariloe. 1999. Modern Pollen Assemblages from Mown and Grazed Vegetation Types in Western Norway. *Review of Palaeobotany and Palynology* 107(1–2):55–81.

Hobsbawm, Eric. 1964. *Labouring Men: Studies in the History of Labour*. London: Weidenfeld and Nicolson.

Hobsbawm, Eric. 1988. On History from Below. In *History from Below: Studies in Popular Protest and Popular Ideology*, edited by Frederic Kranz, pp. 13–28. Oxford: Oxford University Press.

Hobsbawm, Eric. 1996. *An Age of Extremes: A History of the World 1914–1991*. New York: Vintage.

Hobsbawm, Eric. 1997. British History and the *Annales*: A Note. In *On History*, pp. 178–185. London: Abacus.

Hodder, Ian. 1990. *The Domestication of Europe: Structure and Contingency in Neolithic Societies*. Oxford: B. Blackwell.

Hodder, Ian. 2000. Developing a Reflexive Method in Archaeology. In *Towards Reflexive Method in Archaeology: The Example of Çatalhöyük*, edited by I. Hodder. Cambridge: McDonald Institute for Archaeological Research.

Hodges, Richard, Richard Buckley, and Antonio Sennis. 1994. An Early Medieval Building Tradition? A pagliaio at Colli a Volturno (Provincia di Isernia, Molise). *Papers of the British School at Rome* 62:311–321.

Hodges, Richard, and Riccardo Francovich. 2003. *From Villa to Village*. London: Duckworth.

Hollander, David. 2007. *Money in the Late Roman Republic*. Leiden: Brill.

Holleran, Claire. 2012. *Shopping in Ancient Rome: The Retail Trade in the Late Republic and the Principate*. Oxford: Oxford University Press.

Hopkins, Keith. 1980. Taxes and Trade in the Roman Empire (200 B.C.–A.D. 400). *Journal of Roman Studies* 70:101–125.

Hopkins, Keith. 1993. Novel Evidence for Roman Slavery. *Past and Present* 138:3–27.

Hopkins, Keith. 1995–1996. Rome, Taxes, Rents and Trade. *Kodai* 6–7:41–75.

Horden, Peregrine, and Nicholas Purcell. 2000. *The Corrupting Sea: A Study of Mediterranean History*. Oxford: Oxford University Press.

Houben, Hugo, and Hubert Guillaud. 1994. *Earth Construction: A Comprehensive Guide*. London: Intermediate Technology.

Howgego, C. 1992. The Supply and Use of Money in the Roman World 200 B.C. to A.D. 300. *Journal of Roman Studies* 82:1–31.

Hoyer, Daniel. 2018. An Overview of the Numismatic Evidence from Imperial Roman Africa. *Institute for the Study of the Ancient World, Papers* 13. doi: http://doi.org/2333.1/76hdrfz3.

Hudson, Nicholas. 2010. Changing Places: The Archaeology of the Roman *Convivium*. *American Journal of Archaeology* 114(4):663–695.

Ikeguchi, Mamoru. 2006. A Method for Comparing and Interpreting Field Survey Data. In *Ancient Economies, Modern Methodologies: Archaeology, Comparative History, Models and Institutions*, edited by P. Bang, M. Ikeguchi, and H. Ziche, pp. 137–158. Bari: Edipuglia.

Ingold, Tim. 1993. The Temporality of the Landscape. *World Archaeology* 25(2):152–174.

Ingold, Tim. 2011. *Being Alive: Essays on Movement, Knowledge, and Description*. London: Routledge.

Isings, Classina. 1957. *Roman Glass from Dated Finds*. Gröningen: J.B. Wolters.

Ivčević, Sanja. 1997. Emajlirani predmeti iz Arheološkog muzeja u Splitu. *Diadora* 18–19:121–144.

Jackson, Ralph. 2005. The Metalwork. In *The Via Gabina Villas Sites 10, 11 and 13*. http://viagabina.rice.edu/metal/index.html.

Jakab, Éva. 2016. Inheritance. In *The Oxford Handbook of Roman Law and Society*, edited by Paul du Plessis, Clifford Ando, and Kaius Tuori, pp. 498–510. Oxford: Oxford University Press.

Jakab, Éva. 2015. Property Rights in Ancient Rome. In *Ownership and Exploitation of Land and Natural Resources in the Roman World*, edited by Paul Erdkamp, Koenraad Verboven, and Arjan Zuiderhoek, pp. 107–131. Oxford: Oxford University Press.

Johnson, Matthew. 2007. *Ideas of Landscape*. Oxford: Wiley-Blackwell.

Johnston, David. 2015. Succession. In *The Cambridge Companion to Roman Law*, edited by David Johnston, pp. 199–212. Cambridge: Cambridge University Press.

Jones, G.D.B. 1963. Capena and the Ager Capenas: Part II. *Papers of the British School at Rome* 31(1):100–158.

Jones, Martin. 1985. I resti vegetali. In *Settefinestre, una villa schiavistica nell'Etruria Romana. Vol 3. La villa e i suoi reperti*, edited by Andreina Ricci, pp. 306–309. Modena: Panini.

Jongman, Willem. 1988. *The Economy and Society of Pompeii*. Amsterdam: J.C. Gieben.

Jongman, Willem. 2007. The Early Roman Empire: Consumption. In *Cambridge Economic History of the Greco-Roman World*, edited by Walter Scheidel, Ian Morris, and Richard Saller, pp. 592–618. Cambridge: Cambridge University Press.

Joolen, Ester van. 2002. Potential Land Evaluation in Archaeology. In *New Developments in Italian Landscape Archaeology: Theory and Methodology of Field Survey, Land Evaluation and Landscape Perception, Pottery Production and Distribution*, edited by Peter Attema, Gert-Jan Burgers, Ester van Joolen, Martjin van Leusen, and Benoit Mater, pp. 185–188. Oxford: Archaeopress.

Joolen, Ester van. 2003. Archaeological Land Evaluation: A Reconstruction of the Suitability of Ancient Landscapes for Various Land Uses in Italy Focused on the First Millennium BC. Ph.D. diss., University of Groningen.

Jovanović, Jelena. 2013. *Figurae Veneris*. Split: Split Archaeological Museum.

Juan Tovar, Luis Carlos. 1997. Las industrias cerámicas hispanas en el Bajo Imperio. Hacia una sistematización de la Sigillata Hispánica Tardía. In *Congreso Internacional La Hispania de Teodosio*, edited by Ramón Teja and Cesáreo Pérez, pp. 543–568. Valladolid: Consejería de Educacion y Cultura.

Kamermans, Hans. 2000. Land Evaluation as Predictive Modelling: A Deductive Approach. In *Beyond the Map: Archaeology and Spatial Technologies*, edited by Gary Lock, pp. 124–146. Amsterdam: IOS Press.

Karasabbidis, Konstantinos, Maria Yiakoulaki, Agapi Papazafeiriou, Ioannis Mountousis, and Konstantinos Papanikolaou. 2014. A Behavioural Study of the Greek »Thrakian« Sheep Breed Grazing on the Rangelands of Rhodope, Greece. *Archiv Tierzuckt* 9:1–10.

Katsari, Constantina. 2008. The Monetization of Rome's Frontier Provinces. In *The Monetary Systems of the Greeks and Romans*, edited by W.V. Harris, pp. 242–266. Oxford: Oxford University Press.

Kay, Philip. 2014. *Rome's Economic Revolution*. Oxford: Oxford University Press.

Kearney, Michael. 1996. *Reconceptualizing the Peasantry: Anthropology in Global Perspective*. Boulder, CO: Taylor and Francis.

Keay, Simon. 1984. *Late Roman Amphorae in the Western Mediterranean: a Typology and Economic Study. The Catalan Evidence* (BAR, International Series, 196). Oxford: British Archaeological Reports.

Kehoe, Dennis. 1997. *Investment, Profit and Tenancy: The Jurists and the Roman Agrarian Economy*. Ann Arbor: University of Michigan Press.

Kehoe, Dennis. 2007. The Early Roman Empire: Production. In *Cambridge Economic History of the Greco-Roman World*, edited by Walter Scheidel, Ian Morris, and Richard Saller, pp. 543–569. Cambridge: Cambridge University Press.

Kehoe, Dennis. 2015. Property Rights over Land and Economic Growth in the Roman Empire. In *Ownership and Exploitation of Land and Natural*

Resources in the Roman World, edited by Paul Erdkamp, Koenraad Verboven, and Arjan Zuiderhoek, pp. 88–106. Oxford: Oxford University Press.

Kelly, Christopher. 2004. *Ruling the Later Roman Empire*. Berkeley: University of California Press.

Kelly, Robert. 1992. Mobility/Sedentism: Concepts, Archaeological Measures, and Effects. *Annual Review of Anthropology* 21:43–66.

Kemmers, Fleur, and Nanouschka Myrberg. 2011. Rethinking Numismatics: The Archaeology of Coins. *Archaeological Dialogues* 18(1):87–108.

Kenrick, Philip. 2006. Italian Sigillata: The View from Arezzo. In *Territorio e produzioni ceramiche. Paesaggi, economia e società in età romana*, edited by S. Menchelli and M. Pasquinnuci, pp. 201–206. Pisa: Università di Pisa.

Kiiskinen, Harri. 2013. Production and Trade of Etrurian Terra Sigillata Pottery in Roman Etruria and Beyond Between 50 BCE and c. 150 CE. Ph.D. diss., University of Turku.

Kilgrove, Kristina, and Robert Tykot. 2013. Food for Rome: A Stable Isotope Investigation of Diet in the Imperial Period (1st–3rd centuries AD). *Journal of Anthropological Archaeology* 32:28–38.

King, Anthony. The Animal Bones from Le Colonne. Unpublished report.

King, Anthony. 1985. I resti animali: I mammiferi, I rettili e gli anfibi. In *Settefinestre, una villa schiavistica nell'Etruria Romana. Vol 3. La villa e i suoi reperti*, edited by A. Carandini, pp. 278–300. Modena: Panini.

King, Anthony 1997. Animal Bones. In *Excavations at the Mola di Monte Gelato*, edited by Tim Potter and A.C. King, pp. 383–404. London: British School at Rome.

King, Anthony. 1999. Diet in the Roman world: A Regional Inter-site Comparison of the Mammal Bones. *Journal of Roman Archaeology* 12:168–202.

Köpke, Nikola, and Jörg Baten. 2005. The Biological Standard of Living in Europe during the last Two Millennia. *European Review of Economic History* 9(1):61–95.

Koster, Harold. 2000. Neighbors and Pastures: Reciprocity and Access to Pasture. In *Contingent Countryside: Settlement, Economy and Land Use in the Southern Argolid Since 1700*, edited by Susan Buck Sutton, pp. 241–261. Stanford, CA: Stanford University Press.

Kron, Geoffrey. 2000. Roman Ley Farming. *Journal of Roman Archaeology* 13:277–287.

Kron, Geoffery. 2002. Archeozoological Evidence for the Productivity of Roman Livestock Farming. *Münstersche Beiträge zur antiken Handelsgeschichte* 21(2):53–73.

Kron, Geoffery. 2004. A Deposit of Carbonized Hay at Oplontis and Roman Forage Quality. *Mouseion* 4(3):275–330.

Kron, Geoffery. 2005a. Anthropometry, Physical Anthropology, and the Reconstruction of Ancient Health, Nutrition, and Living Standards. *Historia: Zeitschrift für Alte Geschichte* 54(1):68–83.

Kron, Geoffery. 2005b. Sustainable Roman Intensive Mixed Farming Methods: Water Conservation and Erosion Control. In *Concepts, pratiques et enjeux environnementaux dans l'empire romain*, edited by Robert Bedon and Ella Hermon, pp. 285–308. Limoges: Pulim.

Kron, Geoffery. 2008. The Much Maligned Peasant: Comparative Perspectives on the Productivity of the Small Farmer in Classical Antiquity. In *People, Land and Politics: Demographic Developments and the Transformation of Roman Italy, 300 BC–AD 14*, edited by Luk de Ligt and Simon Northwood, pp. 71–119. Leiden: Brill.

Kron, Geoffery. 2012a. Food Production. In *The Cambridge Companion to the Roman Economy*, edited by Walter Scheidel, pp. 156–174. Cambridge: Cambridge University Press.

Kron, Geoffrey. 2015. Agriculture. In *A Companion to Food in the Ancient World*, edited by John Wilkins and Robin Nadeau, pp. 160–172. Oxford: Wiley-Blackwell.

Kron, Geoffery. 2019. Comparative Perspectives on Nutrition and Social Inequality in the Roman World. In *The Routledge Handbook of Diet and Nutrition in the Roman World*, edited by Paul Erdkamp and Claire Holleran, pp. 259–272. London: Routledge.

Künzl, Ernst. 1993. *Die Alamannenbeute aus dem Rhein bei Neupotz: Plünderungsgut aus dem römischen Gallien*. Mainz: Römisch-Germanischen Zentralmuseum.

Lamar, Marti. 1994. 'Choosing' Partible Inheritance: Chilean Merchant Families, 1795–1825. *Journal of Social History* 28(1):125–145.

Lancaster, Lynne. 2008. Roman Engineering and Construction. In *Oxford Handbook of Technology and Engineering in the Classical World*, edited by

John Peter Oleson, pp. 256–284. Oxford: Oxford University Press.

Laschi, Elisa. 2014. Le monete. In *La villa di Ossaia. Il territorio di Cortona in età romana*, edited by Maurizio Gualtieri, Helena Fracchia. and Stefano Ferrari, pp. 275–285. Rome: Quasar.

Launaro, Alessandro. 2011. *Peasants and Slaves: The Rural Population of Roman Italy (200 BC to AD 100)*. Cambridge: Cambridge University Press.

Launaro, Alessandro. 2016. Finley and the Ancient Economy. In *The Making of Moses Finley*, edited by Daniel Jew, Robin Osborne, and Michael Scott, pp. 227–249. Cambridge: Cambridge University Press.

Lavan, Luke, and Michael Mulryan, eds. 2013. *Field Methods and Post-Excavation Techniques in Late Antique Archaeology*. Leiden: Brill.

Lavan, Myles. 2016. The Spread of Roman Citizenship, 14–212 CE: Quantification in the Face of High Uncertainty. *Past and Present* 230:3–46.

Lazzarotto, Antonio. 1993. Elementi di geologia. In *La storia naturale della Toscana meridionale*, edited by F. Giusti, pp. 19–87. Milan: Silvana.

Lazzeretti, Alessandra. 2007. L'ager Rusellanus in epoca romana attraverso le fonti scritte. In *Archeologia urbana a Grosseto. Origine e sviluppo di una città medievale nella "Toscana delle città deboli". Le ricerche 1997–2005*, edited by Citter Carlo and Antonia Arnoldus-Huyzendveld, pp. 63–74. Florence: All'Insegna del Giglio.

Le Bailly, Matthieu, and Françoise Bouchet. 2010. Ancient Dicrocoeliosis: Occurrence, Distribution and Migration. *Acta Tropica* 115(3):175–180.

Le Goff, Jacques. 1980. Peasants and the Rural World in the Literature of the Early Middle Ages (Fifth and Sixth Centuries). In *Time, Work and Culture in the Middle Ages*, pp. 87–100. Chicago: University of Chicago Press.

Le Goff, Jacques. 1988. *Medieval Civilization 400–1500*. Oxford: B. Blackwell.

Le Roux, Brigitte, and Henry Rouanet. 2010. *Multiple Correspondence Analysis*. Thousand Oaks, CA: Sage Publications.

Lebrun, Marie, Géraldine Pernin, Yann Petite, and Marie-Hélène Rousseaux. 2017. Constructions excavées d'époque romaine dans le bassin-versant de la Basse Plaine de la Scarpe (Nord-Pas-de-Calais). In *Produire, transformer et stocker dans les campagnes des Gaules romaines*, edited by Frédéric Trément, pp. 676–695. Bordeaux: Fédération Aquitania.

Lepetz, Sébastien, and Véronique Matterne, eds. 2003. *Cultivateurs, éleveurs et artisans dans les campagnes de Gaule romaine : matières premières et produits transformés. AGER VI, Revue archéologique de Picardie, no. 1/2*. Amiens: Revue archéologique de Picardie.

Lepri, Barbara. 2011. Vetro. In *Scoppieto II. I materiali* edited by Margherita Bergamini, pp. 395–438. Florence: All'Insegna del Giglio.

Leusen, Martjin van. 2002. Pattern to Process: Methodological Investigations into the Formation and Interpretation of Spatial Patterns in Archaeological Landscapes. Ph.D. diss., Rijksuniversiteit Groningen.

Leveau, Philippe, Claude Raynaud, Robert Sablayrolles, and Frédéric Trément, eds. 2009. *Les formes de l'habitat rural gallo-romain. Terminologies et typologies à l'épreuve des réalités archéologiques. AGER VIII, Suppléments Aquitania, 17*. Bordeaux: Aquitania.

Levi, Mario Attilio. 1976. *Né liberi, né schiavi : gruppi sociali e rapporti di lavoro nel mondo ellenistico-romano*. Milan: Cisalpino-Goliardica.

Ligt, Luuk de. 1990. Demand, Supply, Distribution: The Roman Peasantry between Town and Countryside: Rural Monetization and Peasant Demand. *Münstersche Beiträge zur antiken Handelsgeschichte* 9:24–56.

Ligt, Luuk de. 1991. The Roman Peasantry Demand, Supply, Distribution between Town and Countryside II: Supply, Distribution and a Comparative Perspective. *Münstersche Beiträge zur antiken Handelsgeschichte* 10:37–77.

Ligt, Luuk de. 1993. *Fairs and Markets in the Roman Empire*. Amsterdam: J.C. Gieben.

Ligt, Luuk de. 2012. *Peasants, Citizens and Soldiers*. Cambridge: Cambridge University Press.

Lirb, H.J. 1993. Partners in Agriculture: The Pooling of Resources in Rural Societates in Roman Italy. In *De Agricultura: In memoriam Pieter Willem de Neeve (1945–1990)*, edited by Helen Sancisi-Weerdenburg, pp. 263–295. Amsterdam: Gieben.

Llobera, Marcos, Pastor Fábrega-Álvarez, and César Parcero-Oubiña. 2011. Order in Movement: A GIS Approach to Accessibility. *Journal of Archaeological Science* 38(4):843–851.

Lo Cascio, Elio. 1994. The Size of the Roman Population: Beloch and the Meaning of the Augustan Census Figures. *Journal of Roman Studies* 84:23–40.

Lo Cascio, Elio. 2009. *Crescita e declino: Studi di storia dell'economia romana*, *Centro ricerche e documentazione sull'antichità classica, 32*. Rome: L'Erma di Bretschneider.

Lo Cascio, Elio, and Paolo Malanima. 2009. GDP in Pre-modern Agrarian Economies (1–1820 AD). *Rivista di Storia Economica* 25(3):391–419.

Lo Cascio, Elio, and Paolo Malanima. 2014. Ancient and Pre-modern Economies. GDP in the Roman Empire and Early Modern Europe. In *Quantifying the Greco-Roman Economy and Beyond*, edited by François de Callataÿ, pp. 201–219. Bari: Edipuglia.

Lo Cascio, Elio, and Alfredina Storchi Marino, eds. 2001. *Modalità insediative e strutture agrarie nell'Italia meridionale in età romana*. Bari: Edipuglia.

Lockyear, Kris. 2000. Site Finds in Roman Britain: A Comparison of Techniques. *Oxford Journal of Archaeology* 19:397–423.

Loeschcke, Siegfried.1919. *Lampen aus Vindonissa*. Zürich: Beer & Cie.López-Bellido, Luis, Mariano Fuentes, Juan Castillo, R. López-Garrido, and E. Fernández. 1996. Long-term Tillage, Crop Rotation, and Nitrogen Fertilizer Effects on Wheat Yield under Rainfed Mediterranean Conditions. *Agronomy Journal* 88(5):783–791. doi: 10.2134/agronj1996.00021962008800050016x.

López Mullor, Alberto, and Albert Martín Menéndez. 2008. Las ánforas de la Tarraconense. In *Cerámicas hispanorromanas. Un estado de la cuestión*, edited by Dario Bernal Casasola and Albert Ribera i Lacomba, pp. 689–724. Cádiz: Universidad de Cádiz.

López-Sáez, Antonio José, Bas van Geel, and Martín Sánchez M. 2000. Aplicación de los microfósiles no polínicos en Palinología Arqueológica. In *Contributos das ciências e das technologias para a arqueologia da península Ibérica. Actas 3º Congresso de Arqueologia Peninsular IX*, edited by Vitor Oliveira Jorge, pp. 11–20. Porto: ADECAP.

Loridas, Athanasios, Ioannis Mountousis, Christos Roukos, Maria Yiakoulaki, and Kostantinos Papanikolaou. 2011. Grazing Behavior of the Greek Breed of Sheep »Serres« in Lowland and Mountainous Pastures. *Archiv Tierzucht* 54(2):165–176.

Mac Isaac, John D. 1972. The Weight of the Late 4th and Early 5th Century Nummus (Æ4). *American Numismatic Society. Museum Notes* 18:59–66.

MacKinnon, Michael. 1999. The Faunal Remains. In *A Roman Villa and Late Roman Infant Cemetery. Excavation at Poggio Gramignano (Lugnano in Teverina)*, edited by David Soren and Noelle Soren, pp. 533–594. Rome: L'Erma di Bretschneider.

MacKinnon, Michael. 2001. High on the Hog: Linking Zooarchaeological, Literary, and Artistic Data for Pig Breeds in Roman Italy. *American Journal of Archaeology* 105(4):649–673. doi: 10.2307/507411.

MacKinnon, Michael. 2004. *Animal Production and Consumption in Roman Italy: Integrating the Zooarchaeological and Textual Evidence* (Journal of Roman Archaeology Supplementary Series, 54). Portsmouth, RI: Journal of Roman Archaeology.

MacKinnon, Michael. 2009. Changing Patterns of Animal Use over Time and Space at Chianciano Terme, Tuscany: Results from Zooarchaeological Investigations. *Etruscan Studies* 12:185–214.

MacKinnon, Michael. 2010. Cattle 'Breed' Variation and Improvement in Roman Italy: Connecting the Zooarchaeological and Ancient Textual Evidence. *World Archaeology* 42(1):55–73.

MacKinnon, Michael. 2014. Animals in the Urban Fabric of Ostia: Initiating a Comparative Zooarchaeological Synthesis. *Journal of Roman Archaeology* 27:175–201.

MacKinnon, Michael. 2015. Changes in Animal Husbandry as a Consequence of Developing Social and Economic Patterns from the Roman Mediterranean Context. In *Ownership and Exploitation of Land and Natural Resources in the Roman World*, edited by Paul Erdkamp, Koenraad Verboven, and Arjan Zuiderhoek, pp. 249–273. Oxford: Oxford University Press.

MacMullen, Ramsay. 1974. *Roman Social Relations. 50 B.C. to A.D. 284*. New Haven: Yale University Press.

Maddison, Angus. 2007. *Contours of the World Economy, 1–2030 AD*. Oxford: Oxford University Press.

Maggiani, Adriano. 1978. Ager Populoniensis (?), Sasso Pisano. *Rivista di epigrafia etrusca* 46:364–366.

Maggiani, Adriano. 1990. Alfabeti etruschi di età ellenistica. *Annali della fondazione per il museo Faina* 4:177–217.

Manacorda, Daniele. 2002. Populonia, le logge: i bolli laterizi. *Materiali per Populonia* 1:125–144.

Mangiavacchi, Fabio. 2011. La colonizzazione delle campagne maremmane. Dall'appoderamento mezzadrile ai borghi della riforma fondiaria. *Architetture Grosseto* 14:66–84.

Manning, William Henry. 1972. The Iron Objects. In *Verulamium Excavations Vol. I*, edited by Sheppard Frere, pp. 163–195. London: The Society of Antiquaries.

Manning, William Henry. 1985. *Catalogue of the Romano-British Iron Tools, Fittings and Weapons in the British Museum*. London: British Museum.

Mansuy Chevalier-Drevon, Marie Christine. 1994. Architecture, historie et ethnologie. In *Bories. La pierre sauvage*. Saint-Remy-de-Provence: Edisud.

Marabini Moeus, Maria Teresa. 1973. *The Roman Thin Walled Pottery from Cosa (1948–1954)* (Memoirs of the American Academy in Rome, Supplementary Series 32). Rome: American Academy in Rome.

Marani, Flavia. 2016. La position du problème en Italie. In *Les trouvailles de monnaies romaines en contexte médiéval*, edited by Marc Bompaire, Thibault Cardon, Vincent Geneviève, and Flavia Marani, pp. 27–54. Paris.

Marani, Flavia. 2018. I reperti monetali dalle campagne 2011–2016, in La villa dei "Vetti" (Capraia e Limite, Fi): archeologia di una grande residenza aristocratica nel Valdarno tardoantico. *Archeologia Medievale* 44:57–60.

Marichal, Robert. 1988. *Les graffites de la Graufesenque*, *Gallia. Supplement, 47*. Paris: CNRS.

Marignani, Michela, Alessandro Chiarucci, Laura Sadori, and Anna Maria Mercuri. 2017. Natural and Human Impact in Mediterranean Landscapes: An Intriguing Puzzle or only a Question of Time? *Plant Biosystems—An International Journal Dealing with all Aspects of Plant Biology* 51(5):900–905. doi: 10.1080/11263504.2016.1244121.

Marrucchi, Giulia. 2014. *Chiese medievali della Maremma grossetana*. Empoli: Editori dell'Acero.

Martin-Kilcher, Stefanie. 2003. Fish-sauce Amphorae from the Iberian Peninsula: The Forms and Observations on Trade with the North-west Provinces. *Journal of Roman Pottery Studies* 10:69–84.

Martinelli, Franco. 1976. *Società rurali e struttura di classe : problemi e studi di sociologia*. Milano: F. Angeli.

Martyn, Rachelle Martyn, Peter Garnsey, Luciano Fattore, Pierpaolo Petrone, Alessandra Sperduti, Luca Bondioli, and Oliver Craig. 2018. Capturing Roman Dietary Variability in the Catastrophic Death Assemblage at Herculaneum. *Journal of Archaeological Science: Reports* 19:1023–1029. doi: https://doi.org/10.1016/j.jasrep.2017.08.008.

Marx, Karl. 1979. The Eighteenth Braumaire. In *Marx & Engels Collected Works Vol 11: Marx and Engels:1851–1853*, pp. 102–197. London: Lawrence & Wishart.

Marx, Karl, and Frederick Engels. 1956. Manifesto of the Communist Party. In *Marx & Engels Collected Works Vol 06: Marx and Engels:1845–1848*, pp. 477–519. London: Lawrence & Wishart.

Marzano, Analisa. 2007. *Roman Villas in Central Italy: A Social and Economic History*. Leiden: Brill.

Massabò, Bruno. 2007. *Magiche trasparenze. I vetri dell'antica Albingaunum. Guida alla Mostra*. Milan: Anthelios.

Massullo, Gino. 1991. La riforma agraria. In *Storia dell'agricoltura Italiana in éta contemporanea. Vol. III. Mercati e istituzione*, edited by Piero Bevilacqua, pp. 509–542. Venice: Marsilio.

Matero, Frank. 2012. Earthen Architecture: Clay Feet or a Feat of Clay? In *Rammed Earth Conservation*, edited by Camilla Mileto, Fernando Vegas, and Valentina Cristini, pp. 17–19. Boca Raton, FL: CRC Press.

Matterne, Véronique. 2003. Nouvelles données carpologiques relatives à la période gallo-romaine en régions Picardie et Ile-de-France. In *Actualité de la recherche en histoire et archéologie agraires. Actes du colloque AGER V*, edited by François Favory and Anne Vignot, pp. 241–268. Besançon: Presses universitaires franc-comtoises.

Mattingly, David. 2006. *An Imperial Possession: Britain in the Roman Empire*. London: Penguin.

Mattingly, David. 2011. Calculating Plough-zone Demographics: Some Insights from Arid-zone Surveys. In *Settlement, Urbanization and Population*, edited by Alan Bowman and Andrew Wilson, pp. 76–96. Oxford: Oxford University Press.

Mauss, M. 1954. *The Gift: Forms and Functions of Exchange in Archaic Societies*. Glencoe, IL: Free Press.

Mazier, Florence. 2007. Modelisation de la relation entre pluie pollinique actuelle, vegetation et pratiques pastorales en moyenne montagne

(Pyrenees et Jura) application pour l'interprétation des données polliniques fossiles. Ph.D. diss., U.F.R. des Sciences et Techniques, Université de Franche Comte.

McCarthy, Mike. 2013. *The Romano-British Peasant: Towards a Study of People, Landscapes and Work During the Roman Occupation of Britain*. Oxford: Windgather Press.

McCormick, Michael. 2013. What Climate Science, Ausonius, Nile Floods, Rye, and Thatch Tell Us about the Environmental History of the Roman Empire. In *The Ancient Mediterranean Environment between Science and History*, edited by William Harris, pp. 61–88. Leiden: Brill.

McCormick, Michael, Ulf Büntgen, Mark Cane, Edward Cook, Kyle Harper, Peter Huybers, Thomas Litt, Sturt W. Manning, Paul Andrew Mayewski, Alexander More, Kurt Nicolussi, and Willy Tegel. 2012. Climate Change during and after the Roman Empire: Reconstructing the Past from Scientific and Historical Evidence. *Journal of Interdisciplinary History* 43:169–220.

McFadyen, Lesley. 2008. Building and Architecture as Landscape Practice. In *Handbook of Landscape Archaeology*, edited by Bruno David and Julian Thomas. London: Routledge.

McGovern, Patrick. 2004. *L'archeologo e l'uva*. Rome: Carocci.

McLafferty, Sara, and Valerie Preston. 2010. Quotidian Geographies: Placing Feminism. *Gender, Place and Culture* 17:55–60.

Mee, Christopher, and Hamish Forbes, eds. 1997. *A Rough and Rocky Place: The Landscape and Settlement History of the Methana Peninsula, Greece*. Liverpool: Liverpool University Press.

Meikle, Scott. 1994. Aristotle on Money. *Phronesis* 39:26–44.

Menchelli, Simonetta, and Margherita Pasquinnuci. 2006. Archeologia della redistribuzione nell'Etruria settentrionale: il caso di Vada Volaterrana. In *Old Pottery in a New Century: Innovating Perspectives on Roman Pottery Studies*, edited by Daniele Malfitana, Jerome Poblome, and John Lund, pp. 229–240. Rome: L'Erma di Bretschneider.

Menchelli, Simonetta, and Marinella Pasquinucci. 2012. Ceramiche con rivestimento rosso nella Tuscia settentrionale. *Rei Cretariæ Romanæ Favtorvm Acta* 42:229–237.

Mercuri, Anna Maria. 2008. Plant Exploitation and Ethnopalynological Evidence from the Wadi Teshuinat Area (Tadrart Acacus, Libyan Sahara). *Journal of Archaeological Science* 25(1):619–642.

Mercuri, Anna Maria, Carla Alberta Accorsi, Marta Bandini Mazzanti, Giovanna Bosi, Giuliana Trevisan Grandi, Andrea Cardarelli, Donato Labate, LInda Olmi, and Paola Torri. 2006. Cereal Fields from the Middle-Recent Bronze Age, as Found in the Terramara di Montale, in the Po Plain (Emilia Romagna, Northern Italy), Based on Pollen, Seeds/Fruits and Microcharcoals. In *Archaeology of Crop Fields and Gardens*, edited by Jean-Paul Morel, Jordi Tresseras Juan, and Juan Carlos Matamala, pp. 251–270. Bari: Edipuglia.

Mercuri, Anna Maria, Emilia Allevato, Daniele Arobba, Marta Bandini Mazzanti, Giovanna Bosi, Rosanna Caramiello, Elisabetta Castiglioni, Marialetizia Carra, Alessandra Celant, Lorenzo Costantini, Giovanni Di Pasquale, Girolamo Fiorentino, Assunta Florenzano, Maria Angela Guido, Marco Marchesini, Marta Mariotti Lippi, Silvia Marvelli, Antonella Miola, Carlo Montanari, Renato Nisbet, Leonor Peña-Chocarro, Renata Perego, Cesare Ravazzi, Mauro Rottoli, Laura Sadori, Mariano Ucchesus, and Rossella Rinaldi. 2015. Pollen and Macroremains from Holocene Archaeological Sites: A Dataset for the Understanding of the Bio-cultural Diversity of the Italian Landscape. *Review of Palaeobotany and Palynology* 218(1):250–266.

Mercuri, Anna Maria, Marta Bandini Mazzanti, Assunta Florenzano, Maria Chiara Montecchi, Eleonora Rattighieri, and Paola Torri. 2013. Anthropogenic Pollen Indicators from Archaeological Sites as Local Evidence of Human-induced Environments in the Italian Peninsula. *Annali di Botanica* 3:143–153.

Mercuri, Anna Maria, Marta Bandini Mazzanti, Paola Torri, Luigi Vigliotti, Giovanna Bosi, and Assunta Florenzano. 2012. A Marine/Terrestrial Integration for Mid–late Holocene Vegetation History and the Development of the Cultural Landscape in the Po Valley as a Result of Human Impact and Climate Change. *Vegetation History and Archaeobotany* 21:353–372.

Mercuri, Anna Maria, Assunta Florenzano, Isabella Massamba N'siala, Linda Olmi, Dimitris Roubis, and Francesca Sogliani. 2010. Pollen from

Archaeological Layers and Cultural Landscape Reconstruction: Case Studies from the Bradano Valley (Basilicata, Southern Italy). *Plant Biosystems—An International Journal Dealing with all Aspects of Plant Biology* 144(4):888–901.

Migliavacca, Mara, Fabio Saggioro, and Ugo Sauro. 2013. Ethnoarchaeology of Pastoralism: Fieldwork in the Highlands of the Lessini Plateau (Verona, Italy). In *Ethnoarchaeology: Current Research and Field Methods*, edited by Francesca Lugli, Assunta Alessandra Stoppiello, and Stefano Biagetti, pp. 217–223. Oxford: Archaeopress.

Milanesi, Claudio, Monica Scali, Rita Vignani, Franco Cambi, Lucas Dugerdil, Claudia Faleri, and Mauro Cresti. 2016. Archaeobotanical Reconstructions of Vegetation and Report of Mummified Apple Seeds Found in the Cellar of a First-century Roman Villa on Elba Island. *Comptes Rendus Biologies* 339(11–12):487–497. doi: http://dx.doi.org/10.1016/j.crvi.2016.09.003.

Millett, Martin. 2000. The Comparison of Surface and Stratified Artefact Assemblages. In *Non-Destructive Techniques Applied to Landscape Archaeology*, edited by Margherita Pasquinnuci and Frédéric Trément, pp. 216–222. Oxford: Oxbow.

Mills, Philip. 2013. *The Ancient Mediterranean Trade in Ceramic Building Materials. A Case Study in Carthage and Beirut, Roman and Late Antique Mediterranean Pottery, 2*. Oxford: Archaeopress.

Mingazzini, Paolino. 1970. Elenco di bolli di mattoni pubblici. *Atti della accademia nazionale dei lincei. Rendiconti* 25:403–429.

Minniti, Claudia. 2005. Analisi dei resti faunistici provenienti da tre pozzi (nn. 6,7,11) della Tenuta di Vallerano (Roma, I-II secolo d.C.). In *Atti del 3° Convegno Nazionale di Archeozoologia*, edited by IIvana Fiore, Giancarla Malerba, and Salvatore Chilardi, pp. 419–432. Rome: Istituto poligrafico e Zecca dello Stato.

Mirri, Mario, ed. 1979. *Contadini e proprietari nella Toscana moderna: atti del Convegno di studi in onore di Giorgio Giorgetti*. Florence: L.S. Olschki.

Mogetta, Marcello. 2015. A New Date for Concrete in Rome. *Journal of Roman Studies* 105:1–40. doi: doi:10.1017/S007543581500043X.

MOLAS, (Museum of London Archaeological Service). 1994. *Archaeological Site Manual*. 3rd ed. London: MOLAS.

Möller, Heike, and Anna-Katharina Rieger. 2019. Necessity Is the Mother of Invention: The Fuel of Graeco-Roman Pottery Kilns in the Semi-arid Eastern Marmarica (NW-Egypt). In *Fuel and Fire in the Ancient Roman World*, edited by Robin Veal and Victoria Leitch pp. 71–98. Cambridge: MacDonald Institute for Archaeological Research.

Momigliano, Arnaldo. 1982. From Mommsen to Max Weber. *History and Theory* 21(4):16–32. doi: 10.2307/2505018.

Momigliano, Arnaldo. 1984. Max Weber di fronte agli storici dell'antichità. In *Settimo contributo alla storia degli studi classici e del mondo antico*, pp. 245–251. Rome: Edizioni di storia e letteratura.

Mommsen, Theodor. 1856. *Römische Geschichte*. 2nd ed. Leipzig: Weidmann.

Morel, Jean-Paul. 1981. *Céramique campanienne. Les formes*. Rome: Ecole Française de Rome.

Morel, Jean-Paul. 2009. Entre agriclture et artisanat: regards croises sur l'economie de l'Italie tardo-republicaine. In *Agricoltura e scambi nell'Italia tardo-republicano*, edited by Jesper Carlsen and Elio Lo Cascio, pp. 63–90. Bari: Edipuglia.

Moretti, Italo, and Renato Stopani. 1966. *Chiese romaniche nel Chianti*. Florence: Salimbeni.

Moretti, Italo, and Renato Stopani. 1968. *Chiese romaniche in Valdelsa*. Florence: Salimbeni.

Moretti, Italo, and Renato Stopani. 1970. *Chiese romaniche in Val di Cecina*. Florence: Salimbeni.

Morley, Neville. 1996. *Metropolis and Hinterland: The City of Rome and the Italian Economy, 200 B.C.–A.D. 200*. Cambridge: Cambridge University Press.

Morley, Neville. 2001. The Transformation of Italy 225–28 BC. *Journal of Roman Studies* 91:50–62.

Morley, Neville. 2008. Urbanisation and Development in Italy in the Late Republic. In *People, Land and Politics: Demographic Developments and the Transformation of Roman Italy 300 BC–AD 14*, edited by Luuk de Ligt and Simon Northwood, pp. 121–137. Leiden: Brill.

Morley, Neville. 2011. Cities and Economic Development in the Roman Empire. In *Settlement, Urbanization and Population*, edited by Alan Bowman and Andrew Wilson, pp. 143–160. Oxford: Oxford University Press.

Morley, Neville. 2014. Orders of Magnitude, Margins of Error. In *Quantifying the Greco-Roman Economy and Beyond*, edited by François de Callataÿ, pp. 29–42. Bari: Edipuglia.

Morris, Ian. 1999. Foreword. In *The Ancient Economy,* updated edition by M.I. Finley, pp. ix–xxxii. Berkeley: University of California Press.

Morris, Pat. 1979. *Agricultural Buildings in Roman Britain* (BAR British Series, 70). Oxford: British Archaeological Reports.

Morse, Edward. 1894. On the So-called Bow-pullers of Antiquity. *Bulletin of the Essex Institute* 26:141–166.

Motta, Laura. 1997. I paesaggi di Volterra nel tardoantico. *Archeologia Medievale* 24:245–267.

Motta, Laura, Lorenza Camin, and Nicola Terrenato. 1993. Un sito rurale nel territorio di Volterra. *Bollettino di Archeologia* 23–24:109–116.

Motta, Santo. 1969. *Note Illustrative della Carta Geologica d'Italia alla scala 1:100.000, foglio 128, Grosseto*. Florence: Poligrafica & Cartevalori.

Mottram, Hazel, Stepanie Dudd, J.G. Lawrence, Andrew Stott, and Richard Evershed. 1999. New Chromatographic, Mass Spectrometric and Stable Isotope Approaches to the Classification of Degraded Animal Fats Preserved in Archaeological Pottery. *Journal of Chromatography* 833:209–221.

Müller, Martin. 2002. *Die Römischen Buntmetallfunde von Haltern*. Mainz: Philipp von Zabern.

Muller, Serge, Helen Bruneton, Soulié-Märsche Ingeborg, Tony Rey, Alain Thiéry, and Waterkeyn Aline. 2008. Long-term Dynamics of a Mediterranean Alkaline Vernal Pool (Rhone Delta, Southern France). *Wetlands* 28:951–966.

Murphy, Elizabeth. 2015. Socially Embedded Work Practices and Production Organization in the Roman Mediterranean: Beyond Industry Lines. *Journal of Mediterranean Archaeology* 28(2):221–239.

Narotsky, Susan. 2016. Where Have All the Peasants Gone? *Annual Review of Anthropology* 45:301–318.

Navarro, Cristina, José Carrión, Manuel Munuera, and Aldo Prieto. 2001. Cave Surface Pollen and the Palynological Potential of Karstic Cave Sediments in Palaeoecology. *Review of Palaeobotany and Palynology* 117:245–265.

Neeve, Paul de. 1984. *Colonus: Private Farm-Tenancy in Roman Italy during the Republic and the Early Principate*. Amsterdam: J.C. Gieben.

Nicoletta, Natalia. 2011. Ceramica a vernice nera. In *Scoppieto I. I materiali*, edited by Margherita Bergamini, pp. 63–120. Florence: All'Insegna dell Giglio.

Nicosia, Francesco, and Gabriella Poggesi, eds. 1998. *Roselle. Guida al parco archeologico*. Siena: Nuova Immagine.

Nothdurfter, Hans. 2003. Le chiese tardoantiche in Alto Adige. In *Chiese e insediamenti nelle campagne tra V e VI secolo*, edited by G.P. Brogiolo, pp. 191–216. Mantova: Società Archeologica Padana.

Nussbaum, Martha. 1988. *Nature, Function, and Capability: Aristotle on Political Distribution* (Oxford Studies in Ancient Philosophy). Oxford: Oxford University Press.

Nussbaum, Martha. 2000. *Women and Human Development: The Capabilities Approach*. Cambridge: Cambridge University Press.

Nutley, S. and C. Thomas. 1995. Spatial Mobility and Social Change: The Mobile and the Immobile. *Sociologia Ruralis* 35(1):24–39.

Olcese, Gloria, ed. 2011–2012. *Atlante dei siti di produzione ceramica (Toscana, Lazio, Campania e Sicilia)*. Rome: Quasar.

Oosthuizen, Susan. 2013. *Tradition and Transformation in Anglo-Saxon England. Archaeology, Common Rights and Landscape*. London: Duckworth.

Orton, Clive. 1975. Quantitative Pottery Studies: Some Progress, Problems and Prospects." *Science and Archaeology* 16:30–35.

Orton, Clive. 1993. How many Pots Make Five? An Historical Review of Pottery Quantification. *Archaeometry* 35:169–184.

Orton, Clive. 2004. Mathematical Modelling. *Internet Archaeology* 15. doi: https://doi.org/10.11141/ia.15.6.

Orton, Clive. 2009. 'Four Pots Good, Two Pots Bad': Exploring the Limits of Quantification in the Study of Archaeological Ceramics. *Facta: A Journal of Roman Material Culture Studies* 3:65–73.

Osborne, Robin. 1991. The Potential Mobility of Human Populations. *Oxford Journal of Archaeology* 10(2):231–252.

Osborne, Robin. 2004. Demography and Survey. In *Side-by-Side Survey: Comparative Regional Studies in the Mediterranean*, edited by Susan E. Alcock and John Cherry, pp. 162–172. Oxford: Oxbow.

Ostenberg, Carl. 1960. Luni and the Villa Sambuco. In *Etruscan Culture, Land and People*, edited by Axel

Boëthius, pp. 313–320. Malmö: Allhem.

Ouzoulias, Pierre. 2014. *Nos natura non sustinet*: À propos de l'intensification agricole dans quatre terroirs du nord des Gaules. *Gallia* 71(2):307–328.

Ouzoulias, Pierre, and Paul Van Ossel. 2009. Petites et grandes exploitations agricoles: le cas de la Plaine de France. In *Les formes de l'habitat rural gallo-romain. Colloque AGER VIII*, edited by Philippe Leveau, Claude Raynaud, Robert Sablayrolles and Frédéric Trément, pp. 111–121. Bordeaux: Fédération Aquitania.

Oxé, August, Howard Comfort, and Philip Kenrick. 2000. *Corpus Vasorum Arretinorum : A Catalogue of the Signatures, Shapes and Chronology of Italian Sigillata*. Bonn: Habelt.

Pagani, A. 1965. *Monete italiane : dall'invasione napoleonica ai giorni nostri: (1796–1963)*. Milan, Ratto.

Panella, Clementina. 1989. Le anfore italiche del II secolo D.C. In *Amphores romaines et histoire économique: dix ans de recherche. Actes du colloque de Sienne (22–24 mai 1986)*, pp. 139–178. Rome: Ecole française de Rome.

Panella, Clementina. 2001. Le anfore di età imperiale nel Mediterraneo occidentale. In *Céramiques hellenistiques et romaines 3*, pp. 177–225. Paris: Belles Lettres.

Pani Ermini, Letizia, ed. 2015. *Abruzzo sul tratturo magno : borghi, archeologia, paesaggio, architetture, tradizioni, arte, transumanza*. Rome: Èxòrma.

Paolucci, Fabrizio. 1997. *I vetri incisi dall'Italia settentrionale e dalla Rezia nel periodo medio e tardo imperiale*. Florence: All'Insegna del Giglio.

Paolucci, Giulio, ed. 1988. *I Romani di Chiusi. Rivisitazione attraverso testimonianze epigrafiche, topografiche, archeologiche*. Rome: Multigrafica.

Parry, Jonathan, and Maurice Bloch. 1989. Introduction: Money and the Morality of Exchange. In *Money and the Morality of Exchange*, edited by Jonathan Parry and Maurice Bloch, pp. 1–32. Cambridge: Cambridge University Press.

Pasquinucci, Marinella. 2008–2012. Monte Bono. *Fasti Online*. doi: http://www.fastionline.org/excavation/site/AIAC_2321.

Pasquinucci, Marinella, Stefano Genovesi, Ninetta Leone, and Paolo Sangriso. 2007–2008. Monte Bono, Guardistallo (PI), la campagna 2008. *Laboratorio Universitario Volterrano - Quaderno* 12:57–66.

Pasquinucci, Marinella, Stefano Genovesi, Aurora Maccari, Silvia Marini, and Paolo Sangriso. 2012. Guardistello (PI). Monte Bono: la campagna 2012. *Notiziario della Soprintendenza per i Beni Archeologici della Toscana* 8:425–429.

Pasquinucci, Margherita, and Simonetta Menchelli. 2005. Archeologia del paesaggio: popolamento rurale e attività produttive in aree centro-italiche. In *Le dimore dell'Auser. Archeologia, architettura, ambiente dell'antico lago di Sesto*, edited by G. Ciampoltrini and M. Zecchini, pp. 151–160.

Patterson, Helen, ed. 2004. *Bridging the Tiber: Approaches to Regional Archaeology in the Middle Tiber Valley*. London: British School at Rome.

Patterson, Helen, Alessandra Bousquet, Stefano Fontana, Rob Witcher, and Silvia Zampini. 2005. Late Roman Common Wares and Amphorae in the Middle Tiber Valley: The Preliminary Results of the Tiber Valley Project. In *LRCW 1: Late Roman Coarse Wares, Cooking Wares and Amphorae in the Mediterranean: Archaeology and Archaeometry* edited by Jospe Gurt i Esparraguera, Jaume Buxeda i Garrigós, and Miguel Ángel Cau Ontiveros, pp. 369–384. Oxford: Oxbow.

Patterson, Helen, Helga Di Giuseppe, and Rob Witcher. 2004. Three Southern Etrurian 'Crises': First Results of the Tiber Valley Project. *Papers of the British School at Rome* 72:1–36.

Patterson, John. 2006. *Landscapes and Cities: Rural Settlement and Civic Transformation in Early Imperial Italy*. Oxford: Oxford University Press.

Payne, Sebastian. 1987. Reference Codes for Wear Stages in the Mandibular Cheek Teeth of Sheep and Goats. *Journal of Archaeological Science* 14(6):609–614.

Peachin, Michael. 2011. Introduction. In *Social Relations in the Roman World*, edited by Michael Peachin, pp. 3–27. Oxford: Oxford University Press.

Peacock, David. 1980. The Roman Millstone Trade: A Petrological Sketch. *World Archaeology* 12(1):43–53.

Peacock, David. 1982. *Pottery in the Roman World: An Ethnoarchaeological Approach*. London: Longman.

Pecci, Alessandra, Salvador Domínguez-Bella, Mauro Buonincontri, Domenico Miriello, Raffaella Luca, Gaetano Di Pasquale, Daniela Cottica, and Dario Bernal-Casasola. 2018. Combining Residue Analysis of Floors and Ceramics for the Study of Activity

Areas at the Garum Shop at Pompeii. *Archaeological and Anthropological Sciences* 10(2):485–502. doi: 10.1007/s12520-017-0573-7.

Pecci, Alessandra, Gianluca Giorgi, Laura Salvini, and Miguel Ángel Cau Ontiveros. 2013. Identifying Wine Markers in Ceramics and Plasters with Gas Chromatography-mass Spectrometry: Experimental and Archaeological Materials. *Journal of Archaeological Science* 40(1):109–115.

Pecci, Alessandra, Emanuele Vaccaro, Miguel Ángel Cau Ontiveros, and Kim Bowes. 2015. Wine Consumption in a Rural Settlement in Southern Tuscany during Roman and Late Roman Times. In *Le forme della crisi: Cultura materiale nell'Italia centrale tra Romani e Longobardi*, edited by Enrico Cirelli, Francesca Diosono, and Helen Patterson, pp. 229–235. Bologna: Ante Quem.

Peebles, G. 2010. The Anthropology of Credit and Debt. *Annual Review of Anthropology* 39(1):225–240.

Peeples, Matthew, and Gregson Schachner. 2012. Refining Correspondence Analysis-based Ceramic Seriation of Regional Data Sets. *Journal of Archaeological Science* 39(8):2818–2827.

Pejrani Baricco, Luisella. 2003. Chiese rurali in Piemonte tra V e VI secolo. In *Chiese e insediamenti nelle campagne tra V e VI secolo*, edited by Gian Pietro Brogiolo, pp. 57–85. Mantova: Società Archeologica Padana.

Peña, J. Theodore. 2007. *Roman Pottery in the Archaeological Record*. Cambridge: Cambridge University Press.

Perkins, Phil, and Ida Attolini. 1987. An Etruscan Farm at Podere Tartuchino. *Papers of the British School at Rome* 60:71–134.

Pettegrew, David. 2001. Chasing the Classical Farmstead: Assessing the Formation and Signature of Rural Settlement in Greek Landscape Archaeology. *Journal of Mediterranean Archaeology* 14(2):189–209.

Pettegrew, David. 2002. Counting and Coloring Classical Farms: A Response to Osborne, Foxhall and Bintliff *et al*. *Journal of Mediterranean Archaeology* 15(2):267–273.

Pettegrew, David. 2006. Refurbishing the Farms: The Reuse of the Rural Landscape in Late Roman Greece. In *Common Ground: Archaeology, Art, Science and Humanities. The Proceedings of the 16th International Congress of Classical Archaeology, Boston 2003*, edited by Amy Brauer, Carol Mattusch, and Alice Donohue, pp. 33–35. Oxford: Oxbow.

Piéri, Dominique. 2005. *Le commerce du vin oriental à l'époque Byzantine*. Beruit: Institute Français du Proche-Orient.

Pigière, Fabienne, and Annick Lepot. 2014. Une économie de marché entre la ville de Tongres et son arrière? Les exemples de la gestion des ressources animals et de l'approvisionnement en céramique. In *Consommer dans les campagnes de la Gaule romaine*, edited by Xavier Deru and R. González Villaescusa, pp. 155–169. Lille: Université Charles-de-Gaulle Lille 3.

Pitts, Martin. 2010. Artefact Suites and Social Practice: An Integrated Approach to Roman Provincial Finds Assemblages. *Facta: A Journal of Roman Material Culture Studies* 4:125–152.

Pitts, Martin. 2015. Rural Transformation in the Urbanized Landscape. In *Oxford Handbook of Roman Britain*, edited by Martin Millett, Louise Revell, and Alison Moore. Oxford: Oxford University Press.

Potter, Timothy. 1979. *The Changing Landscape of South Etruria*. London: P. Elek.

Price, Jennifer, and Sally Cottam. 1998. *Romano-British Glass Vessels. A Handbook*. York: Council for British Archaeology.

Prilloff, Ralf-Jürgen. 2013. Archäozoologische Analyse de Haus- und Wildtierreste von einem ländlichen Siedlungsplatz bei San Gimignano. In *Leben auf dem Lande: 'Il Monte' bei San Gimignano: Eine römischer Fundplatz und sein Kontext*, edited by Günther Schörner, pp. 91–129. Vienna: Phoibos.

Prowse, Tracy, Henry P. Schwarcz, Shelley Saunders, Roberto Macchiarelli, and Luca Bondioli. 2004. Isotopic Paleodiet Studies of skeletons from the Imperial Roman-age Cemetery of Isola Sacra, Rome, Italy. *Journal of Archaeological Science* 31(3):259–272. doi: https://doi.org/10.1016/j.jas.2003.08.008.

Pucci, Giuseppe, ed. 1992. *La fornace di Umbricio Cordo. L'officina di un ceramista romano e il territorio di Torrita di Siena nell'antichità*. Florence: All'insegna del Giglio.

Pugliese Carratelli, Giovanni, ed. 1985. *Atlante delle forme ceramiche II. Ceramica fine romana nel bacino mediterraneo (tardo ellensimo e primo*

impero). Rome: Istituto della Enciclopedia Italiana.

Purcell, Nicholas. 1995. The Roman Villa and the Landscape of Production. In *Urban Society in Roman Italy*, edited by Tim Cornell and Kathryn Lomas, pp. 151–179. London: UCL Press.

Quilici, Lorenzo, and Stefania Quilici Gigli. 2009. Segni archeologici nella ricostruzione delle coltivazioni agrarie. In *Agricoltura e scambi nell'Italia tardo-republicano*, edited by Jesper Carlsen and Elio Lo Cascio, pp. 221–241. Bari: Edipuglia.

Rajala, Ulla. 2006. "We Would Never Have Thought to Go There"—The Changing Definitions of a Site in Central Italian Archaeology. *Bulletin of the History of Archaeology* 16(1):19–27.

Rapoport, Amos. 1969. *House Form and Culture*. Englewood Cliffs, NJ: Prentice-Hall.

Rastrelli, Anna. 2000. *Chiusi etrusca*. Chiusi (Siena): Edizioni Luì.

Rathbone, Dominic. 2008. Poor Peasants and Silent Sherds. In *People, Land and Politics. Demographic Developments and the Transformation of Roman Italy, 300 BC–AD 14*, edited by Luuk de Ligt and Simon Northwood, pp. 305–332. Leiden: Brill.

Rattighieri, Eleonora. 2016. Il paesaggio culturale di siti rurali Romani in centro-sud Italia: casi studio di Toscana e Sicilia. Ph.D. diss., Scienze della Vita, Modena e Reggio Emilia.

Raux, Stéphanie, and Laurent Vidal. 2017. Les sites de "Torricella" et "Saule" à Lucciana (Haute-Corse): des unités d'exploitation "saissonnière" du terroir de la colonie antique de *Mariana*? In *Produire, trasformer et stocker dans les campagnes des Gaules romaines*, edited by Frédéric Trément, pp. 493–514. Bordeaux: Fédération Aquitania.

Ravazzi, Cesare, Mauro Cremaschi, and Luisa Forlani. 2004. Studio archeobotanico della Terramara di S. Rosa di Poviglio (RE). Nuovi dati e analisi floristica e sintassonomica della vegetazione nell'età del bronzo. In *Il villaggio piccolo della terramara di Santa Rosa di Poviglio: scavi 1987–1992*, edited by Maria Bernabò Brea, Mauro Cremaschi, and Mirella Marini Calvani, pp. 703–735. Florence: Istituto italiano di Preistoria e Protostoria.

Ray, Nick. 2017. Consumer Behavior in Pompeii: Theory and Evidence. In *Economy of Pompeii,* edited by M. Flohr and A. Wilson, pp. 87–109. Oxford: Oxford University Press.

Raynaud, Claude. 2009. Fermes gallo-romaines de la province de Narbonnaise. In *Les formes de l'habitat rural gallo-romain. Colloque AGER VIII*, edited by Philippe Leveau, Claude Raynaud, Robert Sablayrolles and Frédéric Trément, pp. 141–165. Bordeaux: Fédération Aquitania.

Reddé, Michel, ed. 2016a. *Méthodes d'analyse des différents paysages ruraux dans le nord-est de la Gaule romaine*. Paris: RurLand. https://hal.archives-ouvertes.fr/hal-01253470.

Reddé, Michel. 2016b. Some Critical Thinking about Large and Small Rural Settlements in North-eastern Roman Gaul. In *Méthodes d'analyse des différents paysages ruraux dans le nord-est de la Gaule romaine*, edited by Michel Reddé, pp. 7–40: HAL. https://hal.archives-ouvertes.fr/hal-01253470.

Reden, Sitta von. 2010. *Money in Classical Antiquity*. Cambridge: Cambridge University Press.

Reece, Richard. 1984. The Use of Roman Coinage. *Oxford Journal of Archaeology* 3(2):197–210.

Reece, Richard. 1989. Coins and Villas. In *Villa Economies: Economic Aspects of Romano-British Villas*, edited by Keith Branigan and David Miles, pp. 34–41. Sheffield: J.R. Collis.

Reece, Richard. 2016. Roman Coin Finds—Britain, France, Germany and Italy. doi: https://www.academia.edu/22741727/Roman_coins_finds_Britain_France_Germany_and_Italy.

Regoli, Edina. 1985. Tecnica e ripologia delle construzioni. In *Settefinestre: Una villa schiavistica nell'Etruria Romana. 1. La villa nel suo insieme*, edited by Andrea Carandini, pp. 61–73. Modena: Panini.

Rendu, Christine. 2003. Formes et fonctions des habitats pastoraux d'estivage: quelques données pyrénéennes, du néolithique à nos jours. In *Actualité de la recherche en histoire et archéologie agraires. Actes du colloque AGER V*, edited by F. Favory and A. Vignot, pp. 181–188. Besançon: Presses universitaires franc-comtoises.

Renfrew, Colin, and Malcom Wagstaff, eds. 1982. *An Island Polity: The Archaeology of Exploitation in Melos*. Cambridge: Cambridge University Press.

Reynolds, Paul, Michel Bonifay, and Miguel Ángel Cau. 2011. Key Contexts for the Dating of Late Roman Mediterranean Fine Wares: A Preliminary Review and 'Seriation.' In *LRFW 1. Late Roman Fine Wares. Solving Problems of Typology*

and Chronology. A Review of the Evidence, Debate and New Contexts, edited by Miguel Ángel Cau, Paul Reynolds, and Michel Bonifay, pp. 15–32. Oxford: Archaeopress.

Ricci, Andreina, ed. 1985. *Settefinestre: Una villa schiavistica nell'Etruria romana. La villa e i suoi reperti*. Modena: Panini.

Rieger, Anna-Katharina, and Heike Möller. 2011. Kilns, Commodities and Producers: Greco-Roman Pottery Production in Eastern Marmarica (Northwestern Egypt). *Archäologischer Anzeiger* 1:141–170.

Ripollès, Pere Pau, Eva Collado, Carme Delegido, and Daniel Durá. 2009. La moneda en el área rural de Ebusus (siglo IV–I a.C.). In *Ús i circulació de la moneda a la Hispània Citerior. XIII Curs d'Historia monetària d´Hispània*, edited by T. Teresa Ocaña and M. Campo, pp. 105–135. Barcelona: Museu Nacional d'Art de Catalunya.

Rippon, Stephen. 2000. The Romano-British Exploitation of Coastal Wetlands: Survey and Excavation on the North Somerset Levels,1993–7. *Britannia* 31:69–200.

Rippon, Stephen. 2002. Infield and Outfield: The Early Stages of Marshland Colonization and the Evolution of Medieval Field Systems. In *Through Wet and Dry. Essays in Honour of David Hall*, edited by Tom Lane and John Coles, pp. 54–70. Exeter: WARP.

Rippon, Stephen, Ralph Fyfe, and A.G. Brown. 2006. Beyond Villages and Open Fields: The Origins and Development of a Historic Landscape Characterised by Dispersed Settlement in South-west England. *Medieval Archaeology* 50:31–70.

Rippon, Stephen, Chris Smart, and Ben Pears. 2015. *Fields of Britannia: Continuity and Change in the Late Roman and Early Medieval Landscapes*. Oxford: Oxford University Press.

Rix, Helmut. 1977. L'apporto dell onomastica personale alla conoscenza della storia sociale. In *Caratteri dell'ellenismo nelle urne etrusche*, edited by Marina Martelli, pp. 62–78. Florence: Centro Di.

Robertson, Roland. 1995. Glocalization: Time-Space and Homogeneity-Heterogeneity. In *Global Modernities*, edited by Mike Featherstone, Scott Lash, and Roland Robertson, pp. 25–44. London: SAGE.

Robinson, Mark, and Erica Rowan. 2015. Roman Food Remains in Archaeology and the Contents of a Roman Sewer at Herculaneum. In *A Companion to Food in the Ancient World*, edited by John Wilkins and Robin Nadeau, pp. 105–115. London: Wiley Blackwell.

Roselaar, Saskia. 2008. Regional Variations in the Use of the A*ger Publicus*. In *People, Land and Politics: Demographic Developments and the Transformation of Roman Italy 300 BC–AD 14*, edited by L. de Ligt and S. Northwood, pp. 573–602. Leiden: Brill.

Rossiter, J.J. 1978. *Roman Farm Buildings in Italy* (BAR International Series, 52). Oxford: British Archaeological Reports.

Rostovtzeff, Michael. 1910. *Studien zur Geschichte des römischen Kolonates, Archiv für Papyrusforschung und verwandte Gebiete, 1*. Leipzig/Berlin: Teubner.

Rostovtzeff, Michael. 1926. *The Social and Economic History of the Roman Empire*. 1st ed. Oxford: Oxford University Press.

Rowan, Erica. 2016. Bioarchaeological Preservation and Non-elite Diet in the Bay of Naples: An Analysis of the Food Remains from the Cardo V Sewer at the Roman site of Herculaneum. *Environmental Archaeology* 22(3):318–336.

Rowan, Erica. 2017. Sewers, Archaeobotany and Diet at Pompeii and Herculaneum. In *The Economy of Pompeii*, edited by Miko Flohr and Andrew Wilson, pp. 111–133. Oxford: Oxford University Press.

Rubegni, Elisa. 2015. I reperti vetri. In *Diana Umbronensis a Scoglietto. Santuario, Territorio e Cultura Materiale (200 a.C.–550 d.C.)*. edited by Alessandro Sebastiani, Elena Chirico, Matteo Colombini, and Mario Cygielman, pp. 225–243. Oxford: Archaeopress.

Rubio-Campillo, Xavier, Maria Coto-Sarmiento, Jordi Pérez-Gonzalez, and José Remesal Rodríguez. 2017. Bayesian Analysis and Free Market Trade within the Roman Empire. *Antiquity* 91(359):1241–1252.

Rudling, David, Chris Butler, and Rob Wallace. 2010. Barcombe Roman Villa. *British Archaeology* 111:22–27.

Ruegg, S. Dominic, ed. 1995. *Underwater Investigation at Roman Minturnae, Liris-Garigliano River. Part II: Catalogue of Artifacts* (Studies in Mediterranean Archaeology,119). Göteborg: Paul Åströms Förlag.

Russell, Ben, and Elisabeth Fentress. 2016. Mud Brick

and *pisé de terre* between Punic and Roman. In *Proceeding of the 5th International Workshop on the Archaeology of Roman Construction*, edited by Stefano Camporeale, Janet Delaine and Antonio Pizzo, pp. 131–144. Madrid: CSIC.

Russo Ermolli, Elda, Paola Romano, Maria Rosaria Ruello, Maria Rosaria, and Barone Lumaga. 2013. The Natural and Cultural Landscape of Naples (Southern Italy) during the Graeco-Roman and Late Antique Periods. *Journal of Archaeological Science* 42:399–411.

Rutgers, Leonard, Mark van Strydonck, Mathieu Boudin, and C. van der Linde. 2009. Stable Isotope Data from the Rarly Christian Catacombs of Ancient Rome: New Insights into the Dietary Habits of Rome's Early Christians. *Journal of Archaeological Science* 36(5):1127–1134.

Rütti, Beate. 1991. *Die römischen Gläser aus Augst und Kaiseraugst*. Augst: Amt für Museen und Archäologie des Kantons Basel-Landschaft.

Ryan, Janine, Mustafa Pala, Syafrudin MasriMurari Singh, and H.C. Harris. 2008 Rainfed Wheat-based Rotations under Mediterranean-type Climatic Conditions: Crop Sequences, N Fertilization, and Stubble Grazing Intensity in Relation to Cereal Yields Parameters. *European Journal of Agronomy* 28(2):112–118.

Sadori, Laura, Marco Giardini, Carlo Giraudi, and Ilaria Mazzini. 2010. The Plant Landscape of the Imperial Harbour of Rome. *Journal of Archaeological Science* 37(12):3294–3305.

Sadori, Laura, Anna Maria Mercuri, and Marta Mariotti Lippi. 2010. Reconstructing Past Landscape and Human Impact Using Pollen and Plant Remains. *Plant Biosystems - An International Journal Dealing with all Aspects of Plant Biology* 144(4):940–951.

Saglio, Edmond. 1873. Arcus. In *Dictionnaire des antiquités grecques et romaines*, edited by Charles Daremberg and Edmond Salgio, pp. 388–391. Paris: Hachette.

Saladino, Vincenzo. 1980a. Iscrizioni latine di Roselle I. *Zeitschrift für Papyrologie und Epigraphik* 38:159–176.

Saladino, Vincenzo. 1980b. Iscrizioni latine di Roselle II. *Zeitschrift für Papyrologie und Epigraphik* 39:215–235.

Salido Domínguez, Javier. 2017. *Arquitectura rural romana: graneros y almacenes en el Occidental del Imperio*. Autun: Mergoil.

Sallares, Robert. 1991. *Ecology of Ancient Greek World*. Ithaca: Cornell University Press.

Sallares, Robert. 2007. Ecology. In *Cambridge Economic History of the Greco-Roman World*, edited by Walter Scheidel, Ian Morris, and Richard Saller, pp. 15–37. Cambridge: Cambridge University Press.

Saller, Richard. 2002. Framing the Debate over Growth in the Ancient Economy. In *The Ancient Economy*, edited by Walter Scheidel and Sitta von Reden, pp. 251–269. London: Routledge.

Salzotti, Federico, ed. 2013. *Carta Archeologica della Provincia di Siena. Vol. XI: Finalità, metodì, strumenti*. Siena: Nuova Immagine.

Samuels, J. Troy. 2019. Recovering Rural Non-Elites: Commoner Landscapes and Rural Infill in the Roman Middle Republic. Ph.D. diss., University of Michigan.

Sanders, William. 1981. Classic Maya Settlement Patterns and Ethnographic Analogy. In *Lowland Maya Settlement Patterns*, edited by Wendy Ashmore, pp. 351–369. Albuquerque: University of New Mexico Press.

Sannibale, Maurizio. 1998. *Le armi della collezione Gorga al Museo Nazionale Romano* (Studia Archaeologica, 92). Rome: L'Erma di Bretschneider.

Sauro, Ugo, Antonella Arzone, Mara Migliavacca, Vincenzo Pavan, and Fabio Saggioro, eds. 2013. *Tracce di antichi pastori negli Alti Lessini*. Verona: Editrice La Grafica.

Scali, Salvatore. 1993. Appendix 1. I resti faunistici provenienti dalle case romane di Cosa (Ansedonia). In *Cosa IV: The Houses, 1*, edited by Vincent Bruno and Russel Scott, pp. 193–200. Ann Arbor: University of Michigan Press.

Scheidel, Walter. 2001. Progress and Problems in Roman Demography. In *Debating Roman Demography*, edited by Walter Scheidel, pp. 1–82. Leiden: Brill.

Scheidel, Walter. 2004. Human Mobility in Roman Italy, I: The Free Population. *Journal of Roman Studies* 94:1–26.

Scheidel, Walter. 2006. Stratification, Deprivation and Quality of Life. In *Poverty in the Roman World*, edited by Robin Osborne and Margaret Atkins, pp. 40–59. Cambridge: Cambridge University Press.

Scheidel, Walter. 2007. A Model of Real Income

Growth in Roman Italy. *Historia: Zeitschrift für Alte Geschichte* 56:322–346.

Scheidel, Walter. 2008. Roman Population Size: The Logic of the Debate. In *People, Land and Politics: Demographic Developments and the Transformation of Roman Italy 300BC–AD14*, edited by L. de Ligt and S. Northwood, pp. 17–70. Leiden: Brill.

Scheidel, Walter. 2009. In Search of Roman Economic Growth. *Journal of Roman Archaeology* 22:46–70.

Scheidel, Walter. 2017. *The Great Leveler: Violence and the History of Inequality from the Stone Age to the 21st Century*. Princeton: Princeton University Press.

Scheidel, Walter, and Steven Friesen. 2009. The Size of the Economy and the Distribution of Income in the Roman Empire. *Journal of Roman Studies* 99:61–91.

Scheidel, Walter, Ian Morris, and Richard Saller. 2007. Introduction. In *The Cambridge Economic History of the Greco-Roman World* edited by Walter Scheidel, Ian Morris, and Richard Saller, pp. 1–12. Cambridge: Cambridge University Press.

Scheidel, Walter, and Sitta von Redden, eds. 2002. *The Ancient Economy*. New York: Taylor and Francis.

Schiavone, Aldo. 1979. Classi e politica in una società precapitalistica. Il caso della Roma repubblicana. *Quaderni di Storia* 9:33–69.

Schiffer, Michael. 1972. Archaeological Context and Systemic Context. *American Anthropologist* 37(2):156–165.

Schiffer, Michael. 1996. *Formation Processes and the Archaeological Record*. Salt Lake City.

Schofield, A.J., ed. 1991. *Interpreting Artefact Scatters: Contributions to Ploughzone Archaeology*. Oxford: Oxbow.

Schörner, Günther. 2012. Comparing Surface, Topsoil and Subsurface Ceramic Assemblages: The Case of Il Monte, San Gimignano. In *Comparative Issues in the Archaeology of the Roman Rural Landscape: Site Classification between Survey, Excavation and Historical Categories*, edited by Peter Attema and Günther Schörner, pp. 31–41. Portsmouth, RI: Journal of Roman Archaeology.

Sebastiani, Alessandro, Fabiana Fabbri, Valentina Trotta and Edoardo Vanni. 2018. Excavations at Podere Cannicci (Paganico - GR): Results of the First Season at the IMPERO Project. *Fasti Online*. *doi:* http://www.fastionline.org/docs/FOLDER-it-2018-413.pdf.

Sebastiani, Alessandro, Elena Chirico, Matteo Colombini, and Mario Cygielman. 2012. Spolverino (Alberese – GR): relazione alla II campagna di scavi archeologici. *Fasti Online*. doi: www.fastionline.org/docs/FOLDER-it-2012-271.

Sebastiani, Alessandro, Elena Chirico, Matteo Colombini, and Mario Cygielman, eds. 2015. *Diana Umbronensis a Scoglietto. Santuario, Territorio e Cultura Materiale (200 a.C.–550 d.C.)*. Oxford: Archaeopress.

Sebastiani, Alessandro, and Thomas Derrick. 2016. The Glass Workshops and Glass Assemblage from Spolverino. *Journal of Glass Studies* 58:279–286.

Sen, Amartya. 1980. Equality of What? In *The Tanner Lectures on Human Values, Vol. 1*, pp. 195–220. Cambridge: Cambridge University Press.

Sen, Amartya. 1985. *Commodities and Capabilities*. New York: North-Holland.

Sen, Amartya. 1999. *Development as Freedom*. Oxford: Oxford University Press.

Sen, Amartya. 2004. Capabilities, Lists, and Public Reason: Continuing the Conversation. *Feminist Economics* 10(3):77–80.

Servizio Geologico d'Italia. 1967. Carta Geologica d'Italia alla scala 1:100.000, foglio 128, Grosseto, foglio 129, S. Fiora.

Sessa, Kristina. 2019. A New Environmental Fall of Rome: A Methodological Consideration. *Journal of Late Antiquity* 12(1):211–255.

Settis, Salvatore, and Emilio Gabba, eds. 1989. *Misurare la terra: centuriazione e coloni nel mondo romano*. Modena: Panini.

Sfacteria, Marco. 2016. Fotomodellazione 3d e rilievo speditivo di scavo: l'esperienza del Philosophiana Project. *Archeologia e Calcolatori* 27:199–217.

Shanin, Theodor. 1980. Defining Peasants: Conceptualizations and Deconceptualizations. *Journal of Peasant Studies* 14(4):53–73.

Shanin, Theodor. 1988. Expoliary Economies: A Political Economy of Margins. *Journal of Historical Sociology* 1(1):107–115.

Shanin, Theodor. 1990a. A Generalization: Peasantry as a Social Entity. In *Defining Peasants: Essays Concerning Rural Societies, Expolary Economies and Learning from Them in the Contemporary World*, pp. 21–36. Oxford: Oxford University Press.

Shanin, Theodor. 1990b. Chaynov's Message: Illuminations, Miscomprehensions and the Contemporary 'Development Theory'. In *Defining Peasants: Essays*

Concerning Rural Societies, Expolary Economies and Learning from Them in the Contemporary World, pp. 319–340. Oxford: Oxford University Press.

Shanin, Theodor. 1990c. The Unrecognizable Marx and Russian Peasants: An Aside Concerning "Deviations". In *Defining Peasants: Essays Concerning Rural Societies, Expolary Economies and Learning from Them in the Contemporary World*, pp. 313–318. Oxford: Oxford University Press.

Shaw, Brent. 2013. *Bringing in the Sheaves: Economy and Metaphor in the Roman World*. Toronto: University of Toronto Press.

Shennan, Stephen. 1997. *Quantifying Archaeology*. 2nd ed. Edinburgh: Edinburgh University Press.

Shtaerman, Elena Mikhaĭlovna. 1975. *La schiavitù nell'Italia imperiale: I–III secolo*. Rome: Editori Riuniti.

Silver, I.A. 1969. The Ageing of Domestic Animals. In *Science in Archaeology*, edited by Don Brothwell and Eric Higgs, pp. 283–302. London: Thames & Hudson.

Silver, Morris. 2008. The Rise, Demise and (Partial) Rehabilitation of the Peasant in Hopkins Model of Roman Trade and Taxes. *Classics Ireland* 15:1–33.

Simone, Girolamo Ferdinando de. 2017. The Agricultural Economy of Pompeii: Surplus and Dependence. In *The Economy of Pompeii*, edited by Miko Flohr and Andrew Wilson, pp. 23–51. Oxford: Oxford University Press.

Smith, Alexander, Martyn Allen, Tom Brindle, and Michael Fulford, eds. 2016. *The Rural Settlement of Roman Britain* (Britannia Monograph Series, 29). London: Society for the Promotion of Roman Studies.

Smith, Christopher. 2017. J. B. Ward-Perkins, the BSR and the Landscape Tradition in Post-war Italian Archaeology. *Papers of the British School at Rome* 86:271–292. doi: 10.1017/S006824621700037X.

Snead, James, Clark Erickson, and J. Andrew Darling. 2009. Making Human Space: The Archaeology of Trails, Paths, and Roads. In *Landscapes of Movement: Trails, Paths, and Roads in Anthropological Perspective*, edited by James Snead, Clark Erickson and J. Andrew Darling, pp. 1–19. Philadelphia: University of Pennsylvania Museum of Archaeology and Anthropology.

Società Geologica Italiana. 1993. Guide Geologiche Regionali, Appennino Tosco-Emiliano. edited by Valerio Bortolotti. Florence: BeMA.

Sombroek, Wim, and D. Sims. 1995. Planning for Sustainable Use of Land Resources: Toward a New Approach. In *FAO Land and Water Bulletin, 2*. Rome: FAO.

Spagnoli, Emanuela. 2013. I contesti della Basilica Portuense: il quadro economico-monetario. In *La Basilica Portuense. Scavi 1991–2007*, edited by Mauro Maiorano and Lidia Paroli, pp. 521–558. Florence: All'Insegna del Giglio.

Spataro, Michela, and Alexandra Villing, eds. 2015. *Ceramics, Cuisine and Culture. The Archaeology and Science of Kitchen Pottery in the Ancient Mediterranean World*. Oxford Oxbow Books.

Specklin, Robert, ed. 1976. *L'achèvement des paysages agraires. Apogée et crise de la civilisation paysanne de 1789–1914*. Series edited by Georges Duby and Armand Wallon, (Histoire de la France rurale, 3). Paris: Seuil.

Spurr, M.S. 1986. *Arable Cultivation in Roman Italy, 200 B.C.–A.D.100* (Journal of Roman Studies Monographs, 3). London: Society for the Promotion of Roman Studies.

Squatriti, Paolo. 2018. Barbarizing the bel paese: Environmental History in Ostrogothic Italy. In *A Companion to Ostrogothic Italy*, edited by Jonathan Arnold, Shane Bjornlie, and Kristina Sessa, pp. 390–421. Leiden: Brill.

Stagnari, Fabio, Albino Maggio, Angelica Galieni, and Michele Pisante. 2017. Multiple Benefits of Legumes for Agriculture Sustainability: An Overview. *Chemical and Biological Technologies in Agriculture* 4(2). doi: 10.1186/s40538-016-0085-1.

Stevens, C.E. 1966. The Social and Economic Aspects of Rural Settlement. In *Rural Settlement in Roman Britain*, edited by Charles Thomas, pp. 108–130. London: CBA Research Reports.

Stiglitz, Joseph, Amartya Sen, and Jean-Paul Fitoussi. 2009. Report by the Commission on the Measurement of Economic Performance and Social Progress. edited by Organisation for Economic and Co-operation and Development.

Stone, David L. 2000. Society and Economy in North Africa: A Review Article. *Journal of Roman Archaeology* 13:721–724.

Stopani, Renato. 2004. L'insediamento sul podere. In *Cultura contadina in Toscana*, edited by Giovanna Magi, pp. 21–30. Florence: Bonechi.

Storey, Glenn. 2001. Regionaries-type Insulae 1: Architectural/Residential Units at Ostia. *American*

Journal of Archaeology 105(3):389–401.

Storey, Glenn. 2002. Regionaries-type Insulae 2: Architectural/Residential Units at Rome. *American Journal of Archaeology* 106(3):411–434.

Storey, Glenn. 2004. The meaning of "Insula" in Roman Residential Terminology. *Memoirs of the American Academy in Rome* 49:47–84.

Strobel, Pellegrino. 1888. Anelli gemini problematici. *Bullettino di palentologia italiana* 14:92–100.

Strobel, Pellegrino. 1889. Anelli gemini problematici. *Bullettino di palentologia italiana* 15:11–37.

Swift, Ellen. 2013. The Analysis of Reused Material Culture for Late Antique Studies. In *Field Methods and Post-Excavation Techniques in Late Antique Archaeology*, edited by Luke Lavan and Michael Mulryan, pp. 91–119. Leiden: Brill.

Tagliacozzo, Antonio. 1995. I resti ossei faunistici. In *Fouilles de l'École Française de Rome à Bolsena (Poggio Moscini), VII: La citerne 5 et son mobilier*, edited by M.-H. Santrot and J. Santrot, pp. 323–347. Rome: École Française de Rome.

Tartaron, Thomas, Timothy Gregory, Daniel Pullen, Jay Noller, Richard M Rothaus, Joseph Rife, Lita Tzortzopoulou-Gregory, Robert Schon, William Caraher, David Pettegrew, and Dimitri Nakassis. 2006. The Eastern Korinthia Archaeological Survey: Integrated Methods for a Dynamic Landscape. *Hesperia* 75(4):453–523. doi: 10.2972/hesp.75.4.453.

Tassinari, Suzanne. 1993. *Il vasellame bronzeo di Pompei*. Rome: L'Erma di Bretschneider.

Taylor, Claire. 2017. *Poverty, Wealth and Well-Being. Experiencing Penia in Democratic Athens*. Oxford: Oxford University Press.

Tchalenko, Georges. 1953–1959. *Villages antiques de la Syrie du Nord*. Vol. 1. Paris: P. Geuthner.

Teichner, Felix, Karl Oberhofer, and Julia Kopf. 2014. Miróbriga (Santiago do Cacém, Portogallo): nuovi dati archeologici sul modello lusitano della residenza privata in età romana. In *Centro y periferia en el mundo clásico. Actas del XVIII Congreso Internacional Arqueología Clásica*, edited by José María Álvarez Martínez, Trinidad Nogales Basarrate and Isabel Rodà de Llanza, pp. 1121–1124. Mérida: Museo Nacional de Arte Romano.

Temin, Peter. 2001. A Market Economy in the Early Roman Empire. *Journal of Roman Studies* 91:169–181.

Temin, Peter. 2006. Estimating GDP in the Early Roman Empire. In *Innovazione tecnica e progresso economico nel mondo romano*, edited by Elio Lo Cascio, pp. 31–54. Bari: Edipuglia.

Terrenato, Nicola. 1998. *Tam firmum municipium*: The Romanization of *Volaterrae* and Its Cultural Implications. *Journal of Roman Studies* 88:94–114.

Terrenato, Nicola. 2002. The Innocents and the Sceptics: ANTIQUITY and Classical Archaeology. *Antiquity* 76(294):1104–1111.

Terrenato, Nicola. 2005. 'Start the Revolution Without Me': Recent Debates in Italian Classical Archaeology. In *Papers in Italian archaeology VI: Communities and Settlements from the Neolithic to the Early Medieval Period*, edited by P. Attema, A. Nijboer, A. Zifferero, and O. Satijn, pp. 39–43. Oxford: British Archaeological Reports.

Terrenato, Nicola. 2007. The Clans and the Peasants: Reflections on Social Structure and Change in Hellenistic Central Italy. In *Articulating Local Cultures: Power and Identity under the Expanding Roman Republic*, edited by P. Van Dommelen and N. Terrenato, pp. 13–22. Portsmouth, RI: Journal of Roman Archaeology.

Terrenato, Nicola, and Albert Ammerman. 1996. Visibility and Site Recovery in the Cecina Valley Survey, Italy. *Journal of Field Archaeology* 23(1):91–109.

Thomas, Julian. 2001. Archaeologies of Place and Landscape. In *Archaeological Theory Today*, edited by Ian Hodder, pp. 167–186. Cambridge: Polity Press.

Thomas, Julian. 2008. Archaeology, Landscape, and Dwelling. In *Handbook of Landscape Archaeology*, edited by Bruno David and Julian Thomas. London: Routledge. doi: 10.4324/9781315427737.ch30.

Thompson, E.P. 1963. *The Making of the English Working Class* London: V. Gollancz.

Tilley, Christopher. 1994. *A Phenomenology of Landscape. Places, Paths and Monuments*. Oxford: Berg.

Tingle, Martin. 1987. Inferential Limits and Surface Scatters: The Case of the Maddle Farm and Vale of the White Horse Fieldwalking Survey. In *Lithic Analysis and Later British Prehistory: Some Problems and Approaches*, edited by A. Brown and M. Edmonds, pp. 87–100. Oxford: British Archaeological Reports.

Tite, Michael, Vassilis Kilikoglou, and George Vekinis. 2001. Strength, Toughness and Thermal Shock Resistance of Ancient Ceramics, and Their

Influence on Technological Choice. *Archaeometry* 43(3):301–324.

Tompkins, Daniel. 2016. The Making of Moses Finley. In *M.I. Finley. An Ancient Historian and His Impact*, edited by Daniel Jew, Robin Osborne, and Michael Scott, pp. 13–30. Cambridge: Cambridge University Press.

Torelli, Mario. 1981. *Storia degli etruschi*. Rome/Bari: Laterza.

Touwaide, Alain, and Madeline Brown. 2013. Diet, Peasants. In *The Encyclopedia of Ancient History*, edited by Roger S. Bagnall, Kai Brodersen, Craige B. Champion, and Andrew Erskine. New York: John Wiley & Sons, Inc.

Toynbee, Arnold. 1965. *Hannibal's Legacy: The Hannibalic War's Effects on Roman Life,* 2 vols. London: Oxford University Press.

Trément, Frédéric. 2017. Produire, trasformer et stocker dans les campagnes des Gaules romaines. In *Produire, transformer et stocker dans les campagnes des Gaules romaines*, edited by F. Trément, pp. 17–22. Bordeaux: Fédération Aquitania.

Turner, Simon, and A.G. Brown. 2004. Vitis pollen dispersal in and from organic vineyards I. Pollen trap and soil pollen data. *Review of Palaeobotany and Palynology* 129(3):117–132.

Uhalde, Kevin. 2007. *Expectations of Justice in the Age of Augustine*. Philadelphia: University of Pennsylvania Press.

Ulrich, Robert. 2007. *Roman Woodworking*. New Haven: Yale University Press.

Unz, Christoph, and Eckhard Deschler-Erb. 1997 *Katalog der Militaria aus Vindonissa: Militärische Funde, Pferdegeschirr und Jochteile bis 1976*. Brugg: Gesellschaft Pro Vindonissa.

USDA. 1993. *Soil Survey Manual, Handbook No. 18*. Washington, DC: United States Department of Agriculture.

Vaccaro, Emanuele. 2008. An Overview of Rural Settlement in Four River Basins in the Province of Grosseto on the Coast of Tuscany (200 B.C.–A.D. 600). *Journal of Roman Archaeology* 21:225–247.

Vaccaro, Emanuele. 2010. Le merci a Scoglietto prima della fondazione del tempio (150–200 d.C.) in 'Dinamiche insediative nel territorio della foce dell'Ombrone: nuovi dati dagli scavi presso l'area templare dello Scoglietto (Alberese–GR)'. *Notiziario della Soprintendenza per i Beni Archeologici della Toscana* 5:57–65.

Vaccaro, Emanuele. 2011. *Sites and Pots: Settlement and Economy in Southern Tuscany (AD 300–900)* (BAR International Series, 2191). Oxford: Archaeopress.

Vaccaro, Emanuele. 2014. Patterning Late Roman Ceramic Exchange in Southern Tuscany (Italy): The Coastal and Inland Evidence, i.e. Centrality vs. Marginality. In *LRCW 4: 4th International Conference on Late Roman Coarse Ware, Cooking Ware and Amphorae in the Mediterranean: Archaeology and Archaeometry*, edited by Natalia Poulou-Papadimitriou, Eleni Nodarou, and Vassilis Kilikoglou, pp. 11–26. Oxford: Archaeopress.

Vaccaro, Emanuele. 2015. Ceramic Production and Trade in Tuscany (3rd–mid 9th c. AD): New Evidence from the South-west. In *Le forme della crisi. Produzioni ceramiche e commerci nell'Italia centrale tra Romani e Longobardi*, edited by Enrico Cirelli, Francesca Diosono, and Helen Patterson, pp. 211–228. Bari: Edipuglia.

Vaccaro, Emanuele. forthcoming(a). Comparing field survey with excavation: the contribution of the Roman Peasant Project in southern Tuscany.

Vaccaro, Emanuele. forthcoming(b). Early Medieval Pottery in a Sub-regional History (700–1000 AD). In *A Frontier Castle in Southern Etruria: Excavations and Non-Invasive Archaeology at the Castel of Tricosto, Capalbiaccio (1976–2010)*, edited by Michele Hobart.

Vaccaro, Emanuele. 2019. Tombarelle (Cinigiano, GR), parte II: le ceramiche tardoromane e medievali. *FOLD&R Fasti Online* 443: 1–40.

Vaccaro, Emanuele, Kim Bowes, and Mariaelena Ghisleni. 2019. Tombarelle (Cinigiano, GR) parte 1: la survey, lo scavo, le ceramiche di età tardo-repubblicana e primo imperiale. *FOLD&R Fasti Online* 441:1–44. http://www.fastionline.org/docs/FOLDER-it-2019-441.pdf.

Vaccaro, Emanuele, Stefano Campana, Mariaelena Ghisleni, and Matteo Sordini. 2009. Le maglie insediative della valle dell'Ombrone (GR) nel primo millennio d.C. In *Geografie del popolamento. Casi di studio, metodi e teorie*, edited by Giancarlo Macchi Jánica, pp. 285–299. Siena: Università di Siena.

Vaccaro, Emanuele, Claudio Capelli, and Mariaelena Ghisleni. 2017. Italic Sigillata Production and Trade in the Countryside of Central Italy: New Data from the 'Excavating the Roman Peasant

Project'. In *The Economic Integration of Rural Italy: Rural Communities in a Globalizing World*, edited by de Tymon Haas and Gjis Tol, pp. 231–262. Leiden: Brill.

Vaccaro, Emanuele, and Michael MacKinnon. 2014. Pottery and Animal Consumption: New Evidence from the 'Excavating the Roman Peasant Project'. *HEROM. Journal on Hellenistic and Roman Material Culture* 3:225–257.

Valenti, Marco. 1995. *Carta archeologica della provincia di Siena. Vols. 1 & 2, Chianti senese (Castellina in Chianti, Castelnuovo Berardenga, Gaiole in Chianti, Radda in Chianti)*. Siena: Nuova Immagine.

Valenti, Marco, ed. 1996. *Poggio Imperiale a Poggibonsi: Dal villagio di capanne al Castello di Pietra. 1. Diagnostica archaeologica e campagne di scavo 1991–1994*. Siena: All'Insegna del Giglio.

Van der Werff, Jaap H. 1978. Amphores de tradition punique à Uzita. *Bulletin antieke beschaving* 52(3):171–200.

Van Oyen, Astrid. 2015a. The Moral Architecture of Villa Storage in Italy in the 1st c. B.C. *Journal of Roman Archaeology* 28:97–123.

Van Oyen, Astrid. 2015b. The Roman City as Articulated through Terra Sigillata. *Oxford Journal of Archaeology* 34(3):279–299. doi: 10.1111/ojoa.12059.

Van Oyen, Astrid. 2016. *How Things Make History: The Roman Empire and its Terra Sigillata Pottery*. Amsterdam: Amsterdam University Press.

Van Oyen, Astrid. 2020. Innovation and Investment in the Roman Rural Economy through the Lens of Marzuolo (Tuscany, Italy). *Past and Present* 248.

Van Oyen, Astrid, and Rhodora Vennarucci. 2016. Marzuolo: scavi del 2016. *Fasti Online*. doi: http://www.fastionline.org/excavation/site/AIAC_2960.

Van Oyen, Astrid, and Rhodora Vennarucci. 2017. Marzuolo: scavi del 2017. *Fasti Online*. doi: http://www.fastionline.org/excavation/site/AIAC_2960.

Vànky, Kálmán. 1994. *European Smut Fungi*. Stuttgart: Gustav Fischer Verlag.

Veal, Robyn. 2013. Fuelling Ancient Mediterranean Cities: A Framework for Charcoal Research. In *The Ancient Mediterranean Environment Between Science and History*, edited by W. Harris, pp. 37–58. Leiden: Brill.

Veen, Marijke van der. 2007. Food as an Instrument of Social Change: Feasting in Iron Age and Early Roman Britain. In *The Archaeology of Food and Identity*, edited by Katheryn Twiss, pp. 112–129. Carbondale, IL: Center for Archaeological Investigations, Southern Illinois University Carbondale.

Veen, Marijke van der. 2008. Food as Embodied Material Culture: Diversity and Change in Plant Food Consumption in Britain. *Journal of Roman Archaeology* 21:83–109.

Veen, Marijke van der. 2011. *Consumption Trade and Innovation: Exploring the Botanical Remains from the Roman and Islamic Ports at Quseir Al-Qadim, Egypt* (Journal of African Archaeology, Monograph 5). Frankfurt am Main: Africa Magna Verlag.

Vera, Domenico. 1986. Forme e funzioni della rendita fondiaria nell tarda antichità. In *Società romana e impero tardoantico. Instituzioni, ceti, economie*, edited by Andrea Giardina, pp. 367–447. Rome: Laterza.

Vera, Domenico. 1992. Il sistema agrario tardoantico: un modello. In *La Storia dell'Alto Medioevo italiano (VI–X secolo) alla luce dell'archeologia*, edited by Riccardo Francovich and Ghislaine Noyé, pp. 136–138. Siena: All'Insegna del Giglio.

Verboven, Koenraad. 2009. Currency, Bullion and Accounts: Monetary Modes in the Roman World. *Belgisch Tijdschrift Voor Numismatiek En Zegelkunde/Revue Belge de Numismatique et de Sigillographie* 155:91–121.

Vergunst, Jo, and Arnar Árnason. 2012. Introduction: Routing Landscape: Ethnographic Studies of Movement and Journeying. *Landscape Research* 37(2):147–154.

Verhagen, Philip. 2002. Some Considerations on the Use of Archaeological Land Evaluation. In *New Developments in Italian Landscape Archaeology: Theory and Methodology of Field Survey, Land Evaluation and Landscape Perception, Pottery Production and Distribution*, edited by Peter Attema, Gert-Jan Burgers, Ester van Joolen, Martjin van Leusen, and Benoit Mater, pp. 200–204. Oxford: Archaeopress.

Veyne, Paul. 1976. *Le pain et le cirque*. Paris: Seuil.

Veyne, Paul, ed. 1987. *Histoire de la vie privée, vol. I. De L'Empire romain à l'an mil*. Paris: Seuil.

Veyne, Paul. 1990. La "plèbe moyenne" sous le Haut-Empire romain. *Annales* 55–6:1169–1199.

Vigil-Escalera Guirado, Alfonso, Giovanna Bianchi, and Juan Antonio Quirós, eds. 2013. *Horrea, Barns and Silos: Storage and Incomes in Early Medieval Europ*. Bilbao: Universidad del País Vasco.

Wagstaff, Malcom, and Siv Augustson. 1982. Traditional Land Use. In *An Island Polity: The Archaeology of Exploitation in Melos*, edited by Colin Renfrew and Malcom Wagstaff, pp. 106–134. Cambridge: Cambridge University Press.

Walker, Phillip, Rhonda Bathurst, Rebecca Richman, Thor Gjerdrum, and Valerie Andrushko. 2009. The Causes of Porotic Hyperostosis and Cribra Orbitalia: A Reappraisal of the Iron-deficiency-anemia Hypothesis. *American Journal of Physical Anthropology* 139(2):109–125. doi: 10.1002/ajpa.21031.

Wallace-Hadrill, Andrew. 1994. *Houses and Society in Pompeii and Herculaneum*. Princeton: Princeton University Press.

Wallace-Hadrill, Andrew. 1996. Engendering the Roman House. In *I Claudia: Women in Ancient Rome*, edited by Diana Kleiner and Susan Matheson, pp. 104–113. New Haven: Yale University Art Gallery.

Walthall, Alex. forthcoming. A Hellenistic House at Morgantina (Sicily): Interim Report on the Contrada Agnese Project (2014–2019). *Memoirs of the American Academy in Rome*.

Ward-Perkins, Bryan. 2005. *The Fall of Rome and the End of Civilization*. Oxford: Oxford University Press.

Weber, Max. 1891. *Römische Agrargeschichte in ihrer Bedeutung für das Staats-und Privatrecht*. Stuttgart: F. Enke.

Weber, Max. 1924. *Gesammelte Aufsätze zur Sozial-und Wirtschaftsgeschichte*. Tübingen: Mohr.

Weber, Max. 1976. *Agrarian Sociology of Ancient Civilizations*. London: NLB.

Webley, Robert. 2011. HAMP-069741: A Roman Seal Box. *Portable Antiquities Scheme*. doi: https://finds.org.uk/database/artefacts/record/id/428350.

Werlen, Benno. 1993. *Society, Action and Space: An Alternative Human Geography*. London: Routledge.

White, K.D. 1967. *Agricultural Implements of the Roman World*. Cambridge: Cambridge University Press.

White, K.D. 1970. Fallowing, Crop Rotation, and Crop Yields in Roman Times. *Agricultural History* 44(3):281–290.

White, K.D. 1975. *Farm Equipment of the Roman World*. Cambridge: Cambridge University Press.

Whittaker, C.R. 1990. The Consumer City Revisited: The Vicus and the City. *Journal of Roman Archaeology* 3:110–118.

Wickham, Chris. 1989. Paesaggi sepolti: insediamento e incastellamento sull'Amiata, 750–1250. In *L'Amiata nel medioevo*, edited by Mario Ascheri and Wilhelm Kurze, pp. 101–137. Rome: Viella.

Wickham, Chris. 2005. *Framing the Early Middle Ages: Europe and the Mediterranean 400–800*. Oxford: Oxford University Press.

Wilk, Richard, and William Rathje. 1982. Household Archaeology. *American Behavioral Scientist* 25(6):617–639.

Wilkinson, David. 1995. Excavations on Terrace 2: The late Roman Tower. In *San Vincenzo al Volturno 2: The 1980–1986 Excavations*, edited by Richard Hodges, pp. 84–92. London: British School at Rome.

Willderding, Ulrich. 1991. Präsenz, Erhaltung und Repräsentanz von Pflanzenresten in archäologischem Fundgut. In *Progress in Old World Palaeoethnobotany*, edited by Willem van Zeist, Krystyna Wasylikowa, and Karl-Ernst Behre, pp. 25–51. Rotterdam: A.A. Balkema.

Willet, Rinse. 2018. Early Imperial Tableware in Roman Asia Minor: A Perspective on the Diachronic Patterns and Morphological Developments. *Internet Archaeology* 50. doi: https://doi.org/10.11141/ia.50.17.

Williams, Joe. 2013. Approaches to Artifact Assemblages: Inventories, Imagery and Stratified Deposits. In *Field Methods and Post-excavation Techniques in Late Antique Archaeology*, edited by Luke Lavan and Michael Mulryan, pp. 413–439. Leiden: Brill.

Willis, Steven. 2005. *Samian Pottery, a Resource for the Study of Roman Britain and Beyond: The Results of the English Heritage Funded Samian Project. An E-Monograph*. Internet Archaeology, http://intarch.ac.uk/journal/issue17/1/toc.html.

Wilson, Andrew. 1990. Timgad and Textile Production. In *Economies Beyond Agriculture in the Roman World*, edited by David Mattingly and John Salmon, pp. 271–296. London: Routledge.

Wilson, Andrew. 2002. Machines, Power and the Ancient Economy. *Journal of Roman Studies* 92:1–32.

Witcher, Rob. 2006a. Agrarian Spaces in Roman Italy: Society, Economy and Mediterranean Agriculture. *Arqueología espacial (Paisajes agrarios)* 26:341–359.

Witcher, Rob. 2006b. Broken Pots and Meaningless Dots?: Surveying the Landscapes of Roman Italy. *Papers of the British School at Rome* 74:39–72.

Witcher, Rob. 2008. Regional Field Survey and the Demography of Roman Italy. In *People, Land and Politics: Demographic Developments and the Transformation of Roman Italy, 300 BC–AD 14*, edited by Luuk de Ligt and Simon Northwood, pp. 273–303. Leiden: Brill.

Witcher, Rob. 2011. Missing Persons? Models of Mediterranean Regional Survey and Ancient Populations. In *Settlement, Urbanization and Population*, edited by Alan Bowman and Andrew Wilson, pp. 36–75. Oxford: Oxford University Press.

Witcher, Rob. 2012. 'That from a Long Way Off Look Like Farms': The Classification of Roman Rural Sites. In *Comparative Issues in the Archaeology of the Roman Rural Landscape: Site Classification between Survey, Excavation and Historical Categories*, edited by Peter Attema and Güßnther Schörner, pp. 11–30. Portsmouth: Journal of Roman Archaeology.

Wolf, Eric. 1966. *Peasants*. Englewood Cliffs, NJ: Prentice-Hall.

Wolf, Eric. 1982. *Europe and the People without History*. Berkeley: University of California Press.

Zampieri, Girolamo. 2000. Introduzione. In *Bronzi antichi del Museo Archeologico di Padova*, edited by Girolamo Zampieri and Beniamino Lavarone, pp. 1–22. Rome: L'Erma di Bretschneider.

Zech-Matterne, Véronique, Julian Wiethold, and Bénédicte Pradat. 2014. L'essor des blés nus en France septentionale: systèmes de culture et commerce céréalier autour de la conquête césarienne et dans les siècles qui suivent. In *Consommer dans les campagnes de la Gaule romaine*, edited by Xavier Deru and R. González Villaescusa, pp. 23–49. Lille: Université Charles-de-Gaulle Lille 3.

Zeder, Melinda, and Suzanne Pilaar. 2010. Assessing the Reliability of Criteria Used to Identify Mandibles and Mandibular Teeth in Sheep, *Ovis*, and Goat, *Capra*. *Journal of Archaeological Science* 37(2):225–242.

Zerboni, Andrea, Lucia Mori, Giovanna Bosi, Fabrizio Buldrini, Andrea Bernasconi, Maria Carmela Gatto, and Anna Maria Mercuri. 2017. Domestic Firing Activities and Fuel Consumption in a Saharan 1 Oasis: Micromorphological and Archaeobotanical Evidence from the Garamantian Site of Fewet. *Journal for Arid Environments* 144:123–138.

Ziche, Harmut. 2006. Integrating Late Roman Cities, Countryside and Trade. In *Ancient Economies, Modern Methodologies: Archaeology, Comparative History, Models and Institutions*, edited by P. Bang, H. Ikeguchi ,and H. Ziche, pp. 255–276. Bari: Edipuglia.

Zohary, Daniel, and Maria Hopf. 1994. *Domestication of Plants in the Old World*. Oxford: Oxford University Press.