

University of Groningen

From household production to workshops

Nijboer, Albertus

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version

Publisher's PDF, also known as Version of record

Publication date:

1998

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Nijboer, A. J. (1998). From household production to workshops: Archaeological evidence for economic transformations, pre-monetary exchange and urbanisation in central Italy from 800 to 400 BC

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

RIJKSUNIVERSITEIT GRONINGEN

FROM HOUSEHOLD PRODUCTION TO WORKSHOPS

*Archaeological evidence for economic transformations, pre-monetary exchange
and urbanisation in central Italy from 800 to 400 BC*

Proefschrift

ter verkrijging van het doctoraat in de
Letteren
aan de Rijksuniversiteit Groningen
op gezag van de
Rector Magnificus, dr. D.F.J. Bosscher,
in het openbaar te verdedigen op
donderdag 2 april 1998
des namiddags te 2.45 uur

door

Albertus Johannes Nijboer

geboren op 28 april 1960
te Enschede

Promotor:
Prof. dr. M. Kleibrink

ISBN 90-367-0857-5

FROM HOUSEHOLD PRODUCTION TO WORKSHOPS

*Archaeological evidence for economic transformations, pre-monetary exchange
and urbanisation in central Italy from 800 to 400 BC*

Albert J. Nijboer

University of Groningen

(Groningen Institute of Archaeology;
Department of Mediterranean Archaeology)

e-mail: A.J.Nijboer@let.rug.nl

Groningen 1998

computer drawings: Huib Waterbolk
ink-drawings: Huib Waterbolk; M. Weijns; J. Smit

printed by Donkel & Donkel, Drachten

ISBN 90-367-0857-5

No part of this book may be reproduced and/or published in any form, by print, photoprint, microfilm or any other means, without written permission from the author.

copyright A.J. Nijboer 1998

RUG
Department of Archaeology
Poststraat 6
9712 ER Groningen
The Netherlands

e-mail: A.J.Nijboer@let.rug.nl

In commemoration of my sister, Leny Nijboer-van Staaden.

Contents

List of illustrations

Acknowledgements

Preface

Chapter I *FRAMEWORK*

| | | |
|-----|---------------------------------|----|
| 1.1 | Introduction | 1 |
| 1.2 | Theoretical background | 7 |
| 1.3 | Chronology | 15 |
| 1.4 | Method of study | 18 |
| 1.5 | Agricultural foundations | 20 |
| 1.6 | Urbanisation | 24 |
| 1.7 | Economic development | 29 |
| 1.8 | Social and cultural development | 46 |

Chapter II *POTTERY*

| | | |
|-------|--------------------------------|-----|
| 2.1 | Introduction | 50 |
| 2.2 | General geological perspective | 58 |
| 2.3 | Preparation of raw materials | 62 |
| 2.4 | Forming and finishing methods | 64 |
| 2.5 | Firing | 73 |
| 2.6 | Archaeological evidence | 79 |
| 2.6.1 | Satricum | 79 |
| 2.6.2 | Lavinium | 91 |
| 2.6.3 | Laurentina-Acqua Acetosa | 96 |
| 2.6.4 | Caere | 99 |
| 2.6.5 | Acquarossa | 111 |
| 2.6.6 | Poggio Civitate | 113 |
| 2.6.7 | Marzabotto | 118 |
| 2.7 | Ancient literary texts | 126 |
| 2.8 | Conclusion | 128 |

Chapter III *METALS*

| | | |
|-----|-----------------|-----|
| 3.1 | Introduction | 135 |
| 3.2 | Gold and silver | 142 |
| 3.3 | Copper alloys | 144 |
| 3.4 | Iron | 150 |
| 3.5 | Resources | 162 |

| | | |
|-------|-------------------------|-----|
| 3.6 | Archaeological evidence | 165 |
| 3.6.1 | Pithekoussai | 165 |
| 3.6.2 | Satricum | 168 |
| 3.6.3 | Caere | 184 |
| 3.6.4 | Acquarossa | 185 |
| 3.6.5 | Gran Carro | 187 |
| 3.6.6 | Lago dell'Accesa | 188 |
| 3.6.7 | Populonia | 189 |
| 3.6.8 | Poggio Civitate | 193 |
| 3.6.9 | Marzabotto | 196 |
| 3.7 | Conclusion | 202 |

Chapter IV *STANDARDISATION AND PRE-MONETARY EXCHANGE*

| | | |
|-----|--------------|-----|
| 4.1 | Introduction | 207 |
| 4.2 | Weights | 210 |
| 4.3 | Volume | 223 |
| 4.4 | Length | 229 |
| 4.5 | Marzabotto | 230 |
| 4.6 | Conclusion | 233 |

Chapter V *EPILOGUE*

| | | |
|--|--------------|-----|
| | Samenvatting | 247 |
|--|--------------|-----|

| | | |
|--|---|-----|
| | <i>Appendix</i> Iron artefacts which are recorded at Satricum | 257 |
|--|---|-----|

| | | |
|--|---------------------|-----|
| | <i>Bibliography</i> | 262 |
|--|---------------------|-----|

List of illustrations

Fig. 1 Chronological chart of central Italy, the Aegean and central Europe with an indication of the historical dates as well as the dendrochronological dates. This chart is compiled from: Peroni 1994, 80; Bartoloni 1987, 44; *Formazione* 1980.

Fig. 2 Settlement patterns in and around Fidene from the early Iron Age to the 6th century BC. This figure is based on surveys by: Quilici and Quilici Gigli 1986, Tav. CLXXVII, CLXXIX and CLXXX.

Fig. 3 Copper alloy axe, *linuus* and shield which were deposited at Tarquinia. After: Bonghi Jovino and Treré 1997, Tav. 125.

Fig. 4 Model of the correlation in antiquity between towns, workshops and hinterland. After: Bonghi Jovino 1990, 23.

Fig. 5 Ancient Mediterranean shipwrecks from 1000 to 200 BC, grouped in centuries. After: Parker 1992, Fig. 3.

Fig. 6 The distribution of vessels which are assigned to the Micali painter and his followers. After: Rizzo 1988, 85; Spivey 1987, 73.

Fig. 7 Find spots of Etruscan *amphorae* and *bucchero*. Compiled from: Rasenna 1986, 126 and von Hase 1989. See also Niemeyer and Docter 1993.

Fig. 8 Four ethnographic and four archaeological plans of pottery workshops. After: Peacock 1982, 30; Cuomo di Caprio 1992, 24-6; Wachter 1978, Fig. 40; Wild 1973; Thompson 1940, 3-8, Plate I; Saronio 1965.

Fig. 9 Activities in pottery workshops as depicted on Greek vases. After: Eisman and Turnbull, 1978.

Fig. 10 Settlements in Italy to which local manufacture of *bucchero* is assigned. After: Gran-Aymerich 1993, Fig. 3.

Fig. 11 General geological map of the present province of *Lazio*. Compiled from: Sabella 1954, Carta 1; Carta Geologica, Foglio 2.

Fig. 12 The principle of levigation in running water. After: Cuomo di Caprio 1985, 60, Fig. 8.

Fig. 13 Some designs of potters' wheels; *a* and *b* are simple pivoted wheels. Compiled from: Rice 1987, Fig. 5.9; Peacock 1982, Fig. 4; Cuomo di Caprio 1985, Fig. 10.

Fig. 14 Ancient illustrations of wheel-throwing. After: Scheibler 1983; Hodges 1970, 159; Moorey 1994, 147.

Fig. 15 Fine *impasto kotyle* from Ficana. After: Rathje 1983.

Fig. 16 Some ceramic vessels from tomb VII at Poggio Buco. After: Bartoloni 1972, 75-107.

Fig. 17 Two common types of pottery kilns in central Italy; three-dimensional reconstruction and plan. After: Cuomo di Caprio 1985, Figs. 18 and 19.

Fig. 18 Two early ovens from Sorgenti della Nova. After: Negroni Catacchio 1985, 275-83.

Fig. 19 Map of *Satricum*; A, B and C indicate the location of the pottery kilns.

Fig. 20 *Satricum*, plan of kiln A.

Fig. 21 *Satricum*, pottery that was found in kiln A.

Fig. 22 *Satricum*, plan and section of kiln B.

Fig. 23 *Satricum*, settlement features which can be related to kiln B.

Fig. 24 *Satricum*, pottery that was found in kiln B.

Fig. 25 *Satricum*, pale Archaic decorated tiles that were retrieved from kiln B.

Fig. 26 *Satricum*, mould and votive terracottas that were found in and near kiln C.

Fig. 27 Map of Lavinium; A, B and C indicate the position of the pottery kilns.

Fig. 28 Lavinium, pottery kilns and associated structures within the urban area. After: Fenelli 1984.

Fig. 29 Lavinium, pottery kilns and buildings near the XIII altars. After: Giuliani and Somella 1977, Figs 4 and 5 and Damgaard Andersen 1993, Fig. 5.

Fig. 30 Laurentina-Acqua Acetosa, location of settlement areas, necropolis and roads.

Fig. 31 Laurentina-Acqua Acetosa, Archaic industrial quarter with nucleation of pottery workshops.

Fig. 32 *Caere* and its territory with roads, necropoleis and secondary centres. After: Proietti 1986, 9.

Fig. 33 *Caere*, Archaic urban pottery workshop; within the box the position of the workshop is related to other Archaic wall structures on the plateau. After: Mengarelli 1936, Tav. XXIV and Cristofani and Nardi 1988, Fig. X.

Fig. 34 *Caere*, distribution of architectural terracottas on the plateau. After: Nardi 1989, Fig. 2

Fig. 35 *Caere*, manufacture of terracotta sarcophagi during the 7th and 6th centuries BC; their production is related to the local ceramic industry that made architectural terracottas as well as other wares. Compiled from: Buranelli 1985.

Fig. 36 Poggio Civitate, general plan of the monumental structures. Compiled from: Nielsen 1987, Fig. 11 and Phillips 1993, Figs. 8 and 61.

Fig. 37 Poggio Civitate, plan of the southeast building or stoa workshop and the ceramic mould and cast of a *canopic* head. After: Nielsen 1987, Figs. 4, 83 and 84.

Fig. 38 Marzabotto, general map with location of workshops. After: Mansuelli 1979, abb. 1 and Sassatelli 1994, 92, 170, Fig. 1.

Fig. 39 Marzabotto, pottery kilns and building remains in *Regio IV, Insula 4* combined with drawings of a kiln and its structural features. After Brizio 1889.

Fig. 40 Marzabotto, pottery workshop in *Regio II, Insula 1*. After: Saronio 1965.

Fig. 41 Marzabotto, remains of pottery workshop in *Regio III, Insula 4*. After: Pairault Massa and Vallet 1978, Fig. 10.

Fig. 42 Marzabotto, pottery workshop in *Regio IV, Insula 2* combined with an illustration of two kilns in room N. After: Sassatelli and Brizzolara 1991, Fig. 3; 1995, Figs. 1 and 2.

Fig. 43 Production stages during the processing of iron ores.

1. mining iron ores,
2. roasting the ore,
3. pretreatment of the ore,
4. production of carbon,
5. construction of a shaft furnace,
6. firing of shaft furnace,
7. smelting the ore while charging the furnace with additional carbon and ore,
- 8 and 9. removal of the bloom from the furnace,
10. primary smithing.

After: Jöns 1993, Fig.7.

Fig. 44 Table of the carbon content in iron with its nomenclature and properties. After: Cronyn 1990, Table 5.1.

Fig. 45 Section of a shaft furnace while smelting iron ores.

1. furnace wall,
2. air flow through shaft furnace that is filled with carbon and ore,
3. slag formation along furnace wall,
4. smelting process; reduction of iron ore and formation of bloom,
5. slag formation,
6. base of furnace with no slag tapping facilities,
7. opening for tuyères.

After: Hingst 1981, Fig. 2. See also Nikulka and Garbers 1990.

Fig. 46 Reconstruction of some smelting furnaces.

1. bowl furnace, non slag tapping,
2. shaft furnace, non slag tapping,
3. bowl furnace, slag tapping,
4. shaft furnace, slag tapping.

After: Cleere 1972, Fig. 11.

Fig. 47 Ore deposits in Italy; the black circles with numbers indicate mining areas and mineral deposits. The grey circles with black outline and chemical elements represent mineral deposits without specification of the location. Sb: Antimony; Hg: Mercury; Pb: Lead; Zn: Zinc; Fe: Iron; Cu: Copper and Ag: Silver. Compiled from: Fedeli *et alii* 1993, 55; Zifferero 1991 and Giardino 1995 a.

Fig. 48 *Pithekoussai*, suburban industrial complex with an illustration of a copper alloy fibula that was discarded during manufacture and a rim sherd of a local late Geometric krater, with painted retrograde inscription ... *inos m'epoiese[e]*, (a potter whose name ends in) -inos made me. After: Ridgway 1992 a, Figs. 25 and 26.

Fig. 49 *Satricum*, excavation plan and distribution map of iron slags that were excavated on the acropolis.

Fig. 50 *Satricum*, votive deposit I, iron ornaments.

Fig. 51 *Satricum*, votive deposit I, iron tools.

Fig. 52 *Satricum*, votive deposit I, iron weapons.

Fig. 53 *Satricum*, votive deposit I, iron weapons.

Fig. 54 *Satricum*, votive deposit I, iron weapons, shafts and rods.

Fig. 55 *Satricum*, votive deposit I, iron rods, spits and nails.

Fig. 56 *Satricum*, votive deposit I, iron, varia.

Fig. 57 Acquarossa, mineral resources and settlement traces around the site. 1. Acquarossa; 2. Ferento; 3. M. Piombone; 4. ore deposit of Solfatara; 5. ore deposit of Macchia Grande. From: Zifferero 1991.

Fig. 58 Lago dell'Accesa, building remains. After: Camporeale 1985, 132-33.

Fig. 59 Populonia, archaeological features in the immediate vicinity of the settlement. After Martelli: 1981 c, Fig. 115.

Fig. 60 Populonia, building remains in industrial quarter. After: Camporeale 1985, 84-8.

Fig. 61 Marzabotto, *Regio V, Insula 5*, remains of metal workshop. After: Sassatelli 1994, 180.

Fig. 62 Marzabotto, *Regio IV, Insula 1*, living quarters and metal workshops. Division of the buildings according Mansuelli. After: Sassatelli 1994, 72 and Mansuelli 1963.

Fig. 63 Marzabotto, *Regio V, Insula 3*, living quarters and metal workshop. After: Pairault Massa 1978 and Sassatelli 1994, 138.

Fig. 64 Chiusi, ancient balance. After: Gamurini 1889.

Fig. 65 *Satricum*, *Roman-Oscan* pound (S 5166: a) and *Campanian* pound (VG 10564: b).

Fig. 66 *Satricum*, weighing scales from votive deposit I.

Fig. 67 *Satricum*, square B 18, deposition of pottery and metals in between recent ploughed furrows.

Fig. 68 *Satricum*, metal artefacts which were excavated in square B 18.

Fig. 69 *Satricum*, knife and iron axes which were excavated in square B 18.

Fig. 70 *Satricum*, pottery that was excavated in square B 18.

Fig. 71 Campese Bay, near *Isola del Giglio*, a weight from the shipwreck.

Fig. 72 Illustration of a simple mathematical equation for the calculation of the volume of vessels.

Fig. 73 Early measures of capacity from central Italy.

Fig. 74 Athens, *Agora*, exterior of 5th century BC *klepsydra* with inscription and marks combined with an illustration of its function. After: Young 1939.

Fig. 75 Marzabotto, incised and marked stones and pebbles that are interpreted as weights. After: Brizio 1989.

Fig. 76 Marzabotto, diagram of measures of volume and weight.

Fig. 77 Marzabotto, marked bowls that could represent measures of capacity. Compiled from: Sassatelli 1994.

Acknowledgements

This research on economic transformations in central Italy during the period 800 to 400 BC would not have been possible without the kind assistance of various Italian authorities and scholars in granting permission to examine the *Satricum* finds and other archaeological material. I especially would like to thank *Dott. G. Scichilone* of the *Museo Nazionale di Villa Giulia* in Rome, the *Soprintenza Archeologia per il Lazio* and the *Comitato per l'Archeologia Laziale*. Gratitude for their support is also due to Dr. A. Bedini who is in charge of the excavations at Laurentina-Acqua Acetosa, to Prof. Dr. M. Guaitoli and Dr. M. Fenelli who are directing the research at Lavinium and to Dr. I. Iacopi, director of the *Palatino-Foro Romano*. Dr. E.M. Moormann and the staff of the Netherlands Institute in Rome were truly cooperative during my various study leaves at the Institute. Moreover, I am indebted to Dr. P. Lulof, Dr. D.J. Waarsenburg and drs. M. Gnade of the University of Amsterdam who occasionally discussed with me aspects of their archaeological investigations at *Satricum*.

I was much encouraged by fellow scholars who were happy to exchange information on specific topics of research and who responded generously to my enquiries. I particularly would like to mention Dr. G. Buchner, Dr. P. Rendini (*Soprintendenza Archeologica per la Toscana*), Dr. A. Rathje (*Copenhagen University*), Prof. Dr. H.G. Niemeyer (*Universität Hamburg*), Dr. A. Macnamara, Dr. C. Giardino (*Università di Roma 'La Sapienza'*), the late Dr. S.C. Bakhuizen, Dr. A. Zifferero, Dr. J.D. Light (*Canadian Parks Service*), Dr. H. Büsing (*Ruhr Universität, Bochum*), Dr. N. Terrenato, Dr. ir. G.M.M. Houben, Dr. S.J. Vaughan (*The Wiener Laboratory, Athens*), Dr. ir. H. van der Plicht (*University of Groningen*), Dr. R.D. McDonnell, Dr. W.M. Jongman (*University of Groningen*), Prof. Dr. H-G. Bachmann, Dr. H. Damgaard Andersen (*Copenhagen University*), Dr. C. Cucuni Tizzoni, Dr. M. Tizzoni, Dr. M. Stoop, Dr. B. Ambrosiani (*Birka Grävningen, Sweden*), drs. P. van Dommelen (*University of Leiden*) and Prof. Dr. I. Morris (*Stanford University*).

Without my colleagues at the Department of Archaeology of the University of Groningen I could not have started my research. They offered me the opportunity to participate in the excavations at Borgo le Ferriere, *Satricum* where my interest in the topic matured.

I was much stimulated by Prof. Dr. Marianne Kleibrink. Besides being my *promotor*, she has supported me during past years for which I remain in her debt. I acknowledge her as my mentor and I owe my position and progress to her determination and zeal.

With my colleagues Tsjeard Hoekstra, Jelle Bouma, Arnold Beijer, Elizabeth van 't Lindenhout, Peter Attema, Marja Vink and Marjan Galestin, I spent many hours debating sites, theory and literature for which my special thanks. Some of my students analysed part of the material and I wish to give credit to Gerwin Abbingh, Ulrike Oltmanns, Jan-Willem Beestman, Elly Weistra, Sierd-Jan Tuinstra, and Jeroen van der Kamp.

I deeply appreciate the contribution made by Huib Waterbolk who prepared almost all the drawings and maps. This was not an easy task for many of the illustrations are compiled from several, previously published maps, the interpretation of which benefitted much from his reading. Some of the drawings were prepared by Miriam Weijns and Jan Smit, for which my thanks.

Versions of the manuscript were read by Dr. J.W. Bouma, Dr. C.M. Zoethout, drs. Tsj. Hoekstra and drs. G. van Oortmerssen while Anna Brindley corrected the English text.

Finally, I would like to express my gratitude to my referees Dr. Anna Maria Bietti Sestieri, Dr. I. Strøm and the pedologist drs. Antonia M. H. Huyzendveld-Arnoldus. My study greatly benefitted from their suggestions. Members of the evaluation committee who contributed with stimulating comments were Prof. Dr. E.J.A.M. Meijer (*Department of Ancient History, University of Amsterdam*), Prof. Dr. D.P.S. Peacock (*Department of Archaeology, University of Southampton*) and Prof. Dr. R.R. Reinders (*Department of Archaeology, University of Groningen*).

All these colleagues, friends and students enabled me to clarify my thoughts. If the study still contains flaws in arguments and interpretation or mistakes and misunderstandings, these are entirely my own responsibility.

Albert Nijboer, Haarlem, December 1997

Preface

This thesis on social-economic transformations in central Italy during the period 800 to 400 BC, reflects my continuing curiosity in the material aspects of archaeology. The nature of this curiosity explains the structure of my research and thus necessitates an account of the particular steps involved. The topic of research has had my interest for many years, beginning when I was an undergraduate student. My approach towards archaeology can be characterised as a combination of Humanities and Sciences. This approach is reflected in my *curriculum vitae* and in the present study.

As a consequence of my training at the University of Groningen, I became involved in the excavations at Borgo Le Ferriere, approximately 60 km. southeast of Rome. At this site, which is identified as ancient *Satricum*, information from three archaeological contexts is known, that is the necropoleis, temple precinct and the settlement. Due to the integral quality of the contexts and the longstanding and continuing research commitment, *Satricum* can be considered as an archetypal, classic site. The excavations at this site and the materials discovered, are the main point of departure for my research. This investigation evolved from the excavation at *Satricum* of pottery kilns, misfires and metal waste products which date from the 7th to the 4th centuries BC. The evidence for the production of pottery and metals was subjected to material analyses such as thin-sectioning of ceramics and metallographic examinations of iron objects. These investigations are incorporated and will be presented in detail.

In order to compare the situation at *Satricum* with corresponding settlements in central Italy, it became necessary to include information on industrial residues and structures from other sites. At this stage, the area of research increased rapidly which is mainly the result of a lack of technical information on primary production remains at archaeological sites. It eventually became necessary to present the archaeological evidence on technology and industry in both *Latium Vetus* and Etruria.

A complication while examining archaeological evidence on production and economy is the application of modern concepts to past conditions. Occasionally, terms such as urbanisation, market economy, demand, monetary units *etc.*, are used for a society in which these ideas have another meaning when compared with our modern perception of the same concepts. Power, for example, was not based on capital but on land. The concept of capital had, therefore, a different connotation and some scholars even doubt if it existed at all in antiquity.¹ Moreover, theories on technology depend predominantly on changes occurring during and after the industrial revolution of the 18th and 19th centuries AD. For example, the ideas of Marx are based on an examination of capitalist societies and their advance from feudal ones while this thesis examines a society with only slightly increasing labour divisions. The concepts associated with a capitalist society characterised by an advanced rate of specialisation cannot be directly transferred to ancient Italy. Additionally, the techniques involved are fundamentally different in ancient societies when compared with the production technology in modern, capitalist societies. They appear fairly simple because automated machinery was unknown.² Therefore whenever possible I will define and specify the terminology used in order to relate these terms to the conditions encountered in central Italy during the period 800 to 400 BC. Nevertheless, all historical studies are subject to the problem that modern terminology is applied to past conditions. In a general sense I agree with Snodgrass who asked himself, when facing the same problem, how much does this matter? His reply was: '*Very little, I would argue*'.³ At the same time, I have to stress that the economy during this period was embedded in social structures. As a consequence, the economic concepts applied only come

¹ cf. Finley 1981, 17-18, 185-91. However see: Morris 1994 b.

² cf. Hodges 1970, 144-205; Braudel 1979, *tome* 3, 469-70. For example, Braudel reports the technical feats in Ptolomaic Egypt but the constructed machinery was rarely employed for production processes.

³ Snodgrass 1986, 47, 58.

alive when related to the prevailing social phenomena.⁴

The main topic of research are the technological and social-economic developments associated with the advance of the workshop mode of production. This may lead to the conclusion that too much emphasis is placed on functional facets of society. Though I am aware that religious and political aspects play a major role in more complex societies, these topics have not been fundamentally examined during my investigation. Whenever appropriate they have been included in order to illustrate a shift in demand or to explain specific circumstances but they are not discussed *per se*. It must be emphasised that a pre-industrial society is being investigated and that agriculture remained the solid base on which the development presented could ensue. The changes in craft specialisation should be considered as gradual changes with eventually major consequences. I will argue that a redirection of the production facilities is an intrinsic component of the centralisation processes occurring in central Italy from 800 to 400 BC. They are embedded in the transitions from village to towns, from communal to private property and from tribal to state formation. The advance of the workshop mode of production was an active component of these cultural transformations. It was both the result of past developments as well as agent of conditions to come. The increase in craft specialisation was, however, minor in terms of the percentage of the population who shifted their activities towards the production of commodities. By far most of the labour employed in central Italy during these four centuries, was still engaged in agriculture. This cannot be stressed enough since I do not want to impart the impression that I overestimate the extent to which the population of the proto-urban and urban centres in central Italy became engaged in industry and trade rather than agricultural activities.

This thesis, which has a strong materialist orientation, may also lead to confusion about my opinion on non-materialist issues which I would like to eliminate beforehand. The quote at the beginning of chapter I is a remark made by Braudel. He wrote that technique may be the body but not the soul of civilisations. The same could be said about the economy. Material development, techniques and economies are considered to be the substance of civilisations and these aspects elusively reflect the psyche of individuals and their world. Apart from the chapter on measurements and pre-monetary exchange, my main objective has not been to specify the relationship between the materialistic and ideational but to present the archaeological evidence for the advance of the workshop mode of production. My concern is how actual men shaped their material world with the means which were known to them. Whenever I digress on other than economic aspects I hope that I will manage to retain a balance between the general and the specific.

⁴ Austin and Vidal-Naquet 1977, 7-8. These authors consider that '*one cannot apply the concepts and terminology of modern economies, for these apply only to the world for which they have been created*'. It follows that a presentation of the economy in antiquity is only appropriate when related to ancient social history.