

THE INTERNAL ORGANIZATION OF
THE ARRETINE *TERRA SIGILLATA* INDUSTRY:
PROBLEMS OF EVIDENCE AND INTERPRETATION*

By GUNNAR FÜLLE

I. INTRODUCTION

If the field of ancient economy is a battlefield, arguments based on pottery research certainly belong with the best of the weapons. Among the various kinds of pottery serving ancient historians as sources, red-gloss pottery (*terra sigillata*) manufactured in several parts of the Roman Empire plays an outstanding role. This special kind of pottery bears inscriptions in the form of stamps referring to persons involved in its production. In combination with the archaeological contexts of stamp finds, such as excavated sites of production, transportation, storage, and consumption, these inscriptions enable us to gain an insight into the structures of production and distribution. An additional reason why Roman red-gloss pottery is of very great interest to students of the ancient economy is that it was mass-produced, and exported to all parts of the Empire. Results of research in this field are, therefore, frequently used as weighty arguments in the discussion of the character of the Roman economy as a whole.

The main centre of *terra sigillata* production in Italy, and at the same time the first production area, was at the Etruscan town of Arretium, today called Arezzo. A principal source for research on *terra sigillata* from this place is the aforementioned stamps. The more or less standardized Roman system of personal names often enables us to establish the social status of the person referred to. Many finds can be dated on the basis of the stamp's or the vessel's shape, according to typologies developed from the archaeological contexts of such finds. In addition, excavations have brought to light large production installations. From this it seems to be possible to learn much about the structure of the producing firms, and the production process. However, in view of the enthusiasm that has led some scholars to far-reaching conclusions about the structure of Arretine *terra sigillata* production, it does seem to be worth considering what conclusions can be drawn on the basis of the actual sources.

In this paper some of those far-reaching conclusions will be examined with regard to their theoretical and ideological basis, as well as to their relationship to the archaeological evidence. It will be asked whether the conclusions that have been drawn are justifiably based on sources, and whether the prevailing views need to be altered. As a result, alternative possibilities for the interpretation of this material will be raised.

II. ARRETINE *TERRA SIGILLATA* PRODUCTION IN MODELS OF ANCIENT ECONOMY

On the basis of excavations in, and especially towards the end of, the last century,¹ when in Arezzo vessels and hundreds of stamped and unstamped sherds were unearthed

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¹ cf. the bibliographies by H. Comfort, 'terra sigillata', *RE Supp.* 7 (1940), 1295–1352 and G. Pucci, 'Terra Sigillata Italica', in *Enciclopedia dell'Arte Antica Classica e Orientale, Atlante delle Forme Ceramiche* II (1985), 400–4.

as well as large clay-processing installations, the ancient potteries were thought of as having been large factories. Due to the lack of mechanization they were also called manufactories.² At this time the Bücher-Meyer controversy stirred ancient historians' feelings: the matter of dispute was whether the ancient economy was primitive or rather more comparable to modern ones — a question which is still under discussion.³ The existence of such an admittedly impressive centre of mass-production in early imperial Rome has therefore always been a welcome argument, used to reinforce the theories of the so-called 'modernists'. One of the main works with this background, which is still of importance, dealing with questions of ancient economics on a broader scale, will serve as an example.

In his famous *Social and Economic History of the Roman Empire* of 1926, Rostovtzeff described the economic situation of the first century B.C. as 'the same kind of capitalism which had existed in the East before and during the Hellenistic period',⁴ a 'commercial capitalism . . . near to the stage of industrial capitalism that characterizes the economic history of Europe in the nineteenth and twentieth centuries'.⁵ According to him the entrepreneurs 'employed . . . in industry the methods of pure capitalistic economy based on slave-labour'.⁶ 'Among the large industrial centres of the ancient world some Italian cities began to play a prominent part, such as . . . Arretium for a special kind of red varnished pottery'.⁷ On the other hand he mentions 'the rather slow growth of industry, an arrest both of the development of industrial technique and of the transition from the workshop to the true factory. The workshop persisted in being the leading method of production, and even the fact that many shops of the same kind belonged to one man did not transfer them into a factory in the modern sense of the word. We must, however, bear in mind that the work in the workshops was highly differentiated' and produced 'for an indefinite market'.⁸ Under the reign of Augustus, in Rostovtzeff's opinion, things changed in favour of Italy, which played a 'more prominent part than in the 1st cent. B.C.', and 'Arretine pottery . . . dominated for a while the world market'.⁹ Rostovtzeff took his information about Arezzo particularly from Frank and Gummerus.¹⁰ The two of them took different sides concerning the question discussed in the Bücher-Meyer controversy. Gummerus called Arretine potteries large enterprises ('Großbetriebe'), estimating the size of the workforce at 100 plus, and regarding these firms as further examples supporting his modernistic view of ancient economy.¹¹ With regard to Arezzo, Frank was of the opinion that 'the processes [sc. in the potteries] were those of mass-production in a factory. . . ' and 'the extensive proportions of some of the factories are proved beyond a doubt'.¹² As arguments he used the supposed large number of workmen engaged, the wide-spread exports, and the large production installations. Frank looked at the theme explicitly in view of the Bücher-Meyer controversy,¹³ and, in contrast to Gummerus and Rostovtzeff, regarded the assumed factories rather as exceptions than as rules. Some decades later Comfort's important article on *terra sigillata* in Pauly-Wissowa's *Realencyclopädie* still simply refers the reader to Gummerus, concerning the economic side of *terra sigillata* production.¹⁴

On another tack, we encounter the application of modern management theories to Arretine *terra sigillata* production. In the 1960s Kiechle applied von Klaveren's theory

² e.g. H. Gummerus, 'Industrie und Handel (Bei den Römern)', *RE* 9 (1916), 1439–1535, at 1491.

³ cf. M. I. Finley, *The Bücher-Meyer-Controversy* (1979).

⁴ M. Rostovtzeff, *Social and Economic History of the Roman Empire*² (1956), 35–6.

⁵ *ibid.*, 3.

⁶ *ibid.*

⁷ *ibid.*, 36.

⁸ *ibid.*

⁹ *ibid.*, 69–70.

¹⁰ T. Frank, *An Economic History of Rome to the End of the Republic* (1920), and Gummerus, *op. cit.* (n. 2), 1439–1535; cf. M. Rostovtzeff, *Social and Economic History of the Roman Empire* (1926), 490 n. 8 and 498 n. 33. Despite the title of Frank's book, it covers some

industries of the time of the early Principate. In the German edition of his work, Rostovtzeff referred to the successor of Frank's book, *An Economic History of Rome*, which is in this part identical with its predecessor; cf. M. Rostovtzeff, *Sozial- und Wirtschaftsgeschichte des römischen Kaiserreiches* (1931), 241 n. 13 and 251 n. 33, and T. Frank, *An Economic History of Rome*² (1927), 219–22.

¹¹ Gummerus, *op. cit.* (n. 2), 1487–8.

¹² Frank, *op. cit.* (n. 10, 1920), 167–8.

¹³ *ibid.*, 165–6.

¹⁴ Comfort, *op. cit.* (n. 1), 1296. In the same decade, W. L. Westermann, 'Industrial slavery in Roman Italy', *JEH* 2 (1942), 149–63, esp. 158, also took his information from Gummerus' article (*op. cit.* (n. 2)).

of 'spontaneous manufactories' to Arezzo, claiming that the manufactory was in that case the only possible production-form, so that manufactories developed automatically.¹⁵ Moreover, he calls Arezzo the best example of the existence of this 'capitalistic form of production' in antiquity, using this as an argument against the Marxist theory of the law-governed course of history. Kiechle took it as read that the production-form in Arezzo was a manufactory. In later works, the outcome of scholarship was similar, and the manufactory became the assumed mode of production. Pucci attempted to estimate the size of the enterprises by counting the number of slaves associated with a master, and argued for the existence of bigger firms, to fit into a Marxist definition of a manufactory.¹⁶ Peacock drew the same conclusion on the basis of the number of slaves in bigger firms, the existence of large clay-processing basins, and considerations on the presumed division of labour. He regarded manufactories as a well-attested fact.¹⁷ Even Finley, who tried to show that the ancient economy was scarcely comparable to the modern, and that models developed to explain modern phenomena are not applicable,¹⁸ took for granted the fact that more than fifty slaves were employed in some of the large firms working in Arezzo.¹⁹ Carandini, writing about the 'sistema della manifattura urbana schiavistica', refers to Arretine ceramic production as a main source for his theoretical approach.²⁰ So the idea that Arretine *terra sigillata* manufacture partly took place in large manufactories with a high degree of sub-division of labour still flourishes, although today's historians see the ancient economy in a much more sophisticated way, and usually regard large firms as rare exceptions.²¹

During the last decades the discovery that persons known from stamped signatures from Arezzo were also involved in *terra sigillata* manufacture elsewhere has led to the assumption that some Arretine producers were organized as main firms with branch workshops. Since then the discovery of quite a number of such workshops — especially through the use of scientific provenancing methods — has shown the frequency of that phenomenon. It has been suggested that the producers in question established branch workshops to make export easier and to conquer new markets.²²

As another facet of interpretation, the manufacture of *terra sigillata* has been understood so far as an urban industry, explicitly in contrast to the mass rural production of other kinds of pottery such as bricks and tiles, and amphorae.²³

III. DEFINITION OF THE TERM MANUFACTORY

A generally binding definition of this term does not exist. In economic history, it usually describes the condition immediately preceding the factory system of late eighteenth-century Britain.²⁴ Indeed, it is easy to point to the lack of machines as the main difference between a true factory and a manufactory.²⁵ It is more difficult to draw a dividing line between workshop and manufactory. The best contribution to this question, especially with regard to pottery-production, is without doubt Peacock's

¹⁵ F. Kiechle, *Sklavenarbeit und technischer Fortschritt im römischen Reich*, Forschungen zur Antiken Sklaverei 3 (1969), 702, quoting J. v. Klaveren, 'Die Manufakturen des Ancien Régime', *VSWG* 51 (1964), 145-91, esp. 145-6.

¹⁶ G. Pucci, 'La produzione della ceramica aretine. Note sull'industria nella prima età imperiale', *DArch* 7 (1973), 255-93; D. P. S. Peacock, *Pottery in the Roman World: An Ethnoarchaeological Approach* (1982), 121-2.

¹⁷ *ibid.*

¹⁸ M. I. Finley, *The Ancient Economy*² (1984), 26-7.

¹⁹ *ibid.*, 137.

²⁰ A. Carandini, 'Sviluppo e crisi delle manifatture rurali e urbane', in *Società romana e produzione schiavistica. II. Mercati, mercati e scambi nel Mediterraneo* (1981), 249-60, esp. 256-7; cf. *idem*, *Schiavi in Italia. Gli strumenti pensanti dei Romani fra tarda*

Repubblica e medio Impero, Studi NIS Archeologia 8 (1988), 333-4.

²¹ cf. e.g. F. De Martino, *Wirtschaftsgeschichte des alten Rom*² (1991), 339; K. Greene, *The Archaeology of the Roman Economy* (1986), 160; H. Kloft, *Die Wirtschaft der griechisch-römischen Welt* (1992), 172-3; J.-J. Aubert, *Business Managers in Ancient Rome. A Social and Economic Study of Institores 200 B.C.-A.D. 250*, Columbia studies in the classical tradition 21 (1994), 296.

²² For details and literature on branch workshops and related problems cf. below Section IX.

²³ cf. e.g. Aubert, *op. cit.* (n. 21), 217; Carandini, *op. cit.* (n. 20, 1981), 249-60, esp. 256-7 and Carandini, *op. cit.* (n. 20, 1988), 333-4.

²⁴ cf. Peacock, *op. cit.* (n. 16), 9.

²⁵ e.g. Gummerus, *op. cit.* (n. 2), 1491.

discussion of the problem.²⁶ He provides a mixture of Marxist and ethno-archaeological approaches. Following Marx, he regards the main point as being the co-operation of a large number of artisans working in one establishment and producing a single complex artefact. Moreover, he points out that there should be a clear tendency for the job to be split into ever more specialized tasks. Using a comparative approach, he suggests considering a pottery employing more than twelve employees as a manufactory, since this is about the maximum number of employees in modern workshops still using traditional techniques. Therefore, archaeologically, the manufactory will be distinguished by the number of employees, the size of premises, the degree of specialization of the products, the scale of output, and by evidence of the division of labour.

As we have seen, the existence of large manufactories is understandably of much greater interest to most scholars than small workshops. Three main points are stressed when it is claimed that *terra sigillata* production took place in manufactories similar to those preceding modern factories: first, the large number of employees attached to bigger firms; second, the minute sub-division of labour; third, as a conclusion drawn from the first argument in combination with the evidence of large clay-processing basins, the considerable size of a single production unit. Does the Arretine *terra sigillata* production really meet these characteristics?²⁷

IV. STAMPS ON *TERRA SIGILLATA* FROM AREZZO

Stamps on vessels are the main source for the reconstruction of the social and economic structure of *terra sigillata* manufacture in Arezzo. It is not possible to draw any conclusions without analysing them. Therefore a discussion of the stamps, and of connected problems, is essential as a basis for further investigation.

Information given by stamps on Arretine ware is very scant. Mostly it consists only of a more or less abbreviated name with no hint as to the function of the person behind it. It follows that stamps cannot be interpreted without taking note of the contexts of names on other stamps, and comparable forms of names in other fields, e.g. on bricks and tiles, or stone inscriptions. In addition, archaeological evidence, such as places and contexts of finds, must be included. Finally, results of research on the production of similar kinds of artefacts, e.g. bricks and tiles, or amphorae, are available to fill the gaps by comparison of structures.

A. Reasons for Stamping *Terra Sigillata*

Although it is agreed that in research on marked products (*instrumentum domesticum*) objects must be classified by kind of product, chronology, provenance, and even typology,²⁸ it can be helpful to look for parallels in the custom of marking different

²⁶ Peacock, op. cit. (n. 16), 9–10, 43–6.

²⁷ The following considerations take necessary data from G. Prachner, *Die Sklaven und Freigelassenen im arretinischen Sigillatagewerbe. Epigraphische, nomenklatorische sowie sozial- und wirtschaftsgeschichtliche Untersuchungen der arretinischen Firmen- und Töpferstempel*, Forschungen zur antiken Sklaverei 12 (1980), hereafter referred to as *SFAS*, who analysed stamps of twenty-nine selected Arretine firms and produced detailed tables containing potters' stamps and information about the amount and sorts of vessels made by each of them, as well as the places where the remains were found. Including new finds, his data is more comprehensive than that of the *Corpus Vasorum Arretinorum*, compiled by A. Oxé, edited by H. Comfort (Antiquitas 3 (1968)); hereafter referred to as *CVArr*. He was also able to include the as yet

unpublished substantial finds made in Neuß, later published in E. Ettlinger, *Novaesium IX. Die italische Sigillata von Novaesium*, Limesforschungen 21 (1983), in Haltern, later published in S. v. Schnurbein, *Die unverzierte Terra Sigillata aus Haltern*, Bodenaltertümer Westfalens 19 (1982), and in Dangstetten, meanwhile partly published in G. Fingerlin, *Dangstetten I. Katalog der Funde (Fundstellen 1–603)*, Forschungen und Berichte zur Vor- und Frühgeschichte in Baden-Württemberg 22 (1986). See also *SFAS*, vii (Vorwort) and 3 with n. 14.

²⁸ D. Manacorda, 'Appunti sulla bollatura in età romana', in W. V. Harris (ed.), *The Inscribed Economy. Production and Distribution in the Roman Empire in the Light of Instrumentum Domesticum*, JRA suppl. ser. 6 (1993), 37–54, esp. 37.

products mainly during the early and middle Empire.²⁹ For containers, e.g. amphorae and wooden barrels, there are two different places for stamped marking: the vessel itself, and its stopper, the former being agreed to refer to manufacturing, the latter to transportation; occasionally on amphorae there are additional painted inscriptions (*tituli picti*) referring to the marketing of the content.³⁰ Clay jars (*dolia*) were stamped before firing, and legal sources report that occasionally they were also signed in the context of trade (*dolium signatum ab emptore*).³¹ Lead and other metal bars received a first mark integrated in the mould when being cast, and a punched one, possibly attached when merchandized.³² Bricks and tiles bear only stamps applied during the production process, although in a few cases a *negotiator* is mentioned.³³ Terracotta lamps have stamped signatures related to manufacture alone.³⁴ The same applies to *terra sigillata*, where stamps were applied during the production process only. There are, however, a few examples of graffiti carved on *terra sigillata* which could have been applied during distribution, but these are so sporadic that no definite conclusions can be drawn on that basis.³⁵ When considering *terra sigillata* we are, therefore, confined to marks related to manufacture.

Nevertheless the question arises why marks were applied in the course of production on commodities such as *terra sigillata* at all. There are five main reasons for marking goods: to indicate the owner of an item; to guarantee compliance with certain standards or expectations of quality or measure; to facilitate public control of the producer and/or the production for whatever purpose; to promote the product; to give information which is needed for the organization of production and/or sale.³⁶

In the case of vessels used for the transportation of various goods the advantage of standards of both quality and measure is obvious: stability was a crucial condition for loading, transporting, and unloading without damage, and the purchaser of the goods had to rely on the correspondence of the actual volume of a container with the declared one. Especially for amphorae it has been argued with good reason that marks on them should be seen as part of a system of guarantees of intactness, stability, and correct measures for commercial and customs purposes.³⁷ Legal sources show that these very qualities could be expected by any purchaser not only of amphorae, but also of bricks, tiles, and other containers.³⁸ As to bricks and tiles as building material even public

²⁹ G. Siebert, 'Signatures d'artistes, d'artisans et de fabricants dans l'antiquité classique', *Ktéma* 3 (1978), 111-31; Manacorda, op. cit. (n. 28), 37; Aubert, op. cit. (n. 21), 201-318.

³⁰ cf. for transport and storage vessels in general Manacorda, op. cit. (n. 28), 37-8. On details esp. about amphorae recently B. Liou and A. Tchernia, 'L'interprétation des inscriptions sur les amphores Dressel 20', in *Epigrafi della produzione e della distribuzione. Actes de la VII^e Rencontre franco-italienne sur l'épigraphie du monde romain (Rome, 5-6 juin 1992)*, Collection de l'École française de Rome 193 (1994), 133-56; for *dolia* cf. also Aubert, op. cit. (n. 21), 246-56, 265-7, 269-74; D. Manacorda and C. Panella, 'Anfore', in Harris, op. cit. (n. 28), 55-64; on wooden barrels now G. Baratta, 'Bolli su botti', in *Epigrafi della produzione e della distribuzione. Actes de la VII^e Rencontre franco-italienne sur l'épigraphie du monde romain (Rome, 5-6 juin 1992)*, Collection de l'École française de Rome 193 (1994), 555-65.

³¹ *Dig.* 18.6.1.2. Manacorda, op. cit. (n. 28), 38.

³² C. Domergue, 'Production et commerce des métaux dans le monde romain: l'exemple des métaux hispaniques d'après l'épigraphie des lingots', in *Epigrafi della produzione e della distribuzione. Actes de la VII^e Rencontre franco-italienne sur l'épigraphie du monde romain (Rome, 5-6 juin 1992)*, Collection de l'École française de Rome 193 (1994), 61-91, esp. 62-4, 71-3; Manacorda, op. cit. (n. 28), 38; D. Colls et al., 'Les lingots de plomb de l'épave romaine *Cabrera* 5 (Ile de Cabrera, Baléares)', *Archaeonautica* 5 (1986), 31-80, esp. 69-70.

³³ Manacorda, op. cit. (n. 28), 38; M. Steinby, 'I senatori e l'industria laterizia urbana', *Tituli* 4 (1982), 227-37, esp. 232-3; eadem, 'L'industria laterizia di Roma nel tardo-impero', in A. Giardina (ed.), *Società e impero tardo antico* II (1986), 99-164, esp. 100, 106-7, 149-50; eadem, 'L'organizzazione produttiva del laterizi: un modello interpretativo per l'*instrumentum* in genere?', in Harris, op. cit. (n. 28), 139-43.

³⁴ Aubert, op. cit. (n. 21), 303-18; W. V. Harris, 'Roma terracotta lamps: the organization of an industry', *JRS* 70 (1980), 126-45.

³⁵ S. Zabełlicky-Scheffenecker, 'TK — Zur kommerziellen Verbindung des Magdalensberges mit Aquileia', in *Lebendige Altertumswissenschaft (Festschrift H. Vetters)* (1985), 252-4, describes the ligated abbreviation 'TK' incised on *terra sigillata* vessels from Arezzo and the plain of the river Po, on an amphora-fragment, and on a stone-weight, occasionally also in connection with numerals. She suggests that these marks were applied by an Aquileia-based wholesaler, possibly belonging to the prominent *gens Kamia* from Aquileia.

³⁶ cf. Manacorda, op. cit. (n. 28), 38, 44-5.

³⁷ D. Manacorda, 'Le anfore dell'Italia repubblicana: aspetti economici e sociali', in *Amphores romaines et histoire économique. Dix ans de recherche*, Collection de l'École française de Rome 114 (1989), 443-67.

³⁸ Manacorda, op. cit. (n. 28), 39.

interests could be affected, so that the statement of origin could have served for public control of the production and quality.³⁹ On the other hand, it has been suggested that certain stamps on bricks reflect the contract between the landowner and the actual producer, so that here internal organization of production was the actual reason for the use of stamps.⁴⁰ Recently the use of stamps on Spanish oil amphorae has also been explained first and foremost in the context of production.⁴¹

It has in any case become a widely held opinion that marks on *instrumentum domesticum* were mainly used as labels of guarantee, enabling a dissatisfied customer to bring a lawsuit against the person responsible for the quality of the products.⁴²

One has to ask, however, on what level of distribution this was really possible. Is it in the case of goods which were distributed all over the Roman Empire — as was *terra sigillata* — conceivable that a dissatisfied customer, e.g. somewhere in the Rhineland, could have brought a lawsuit against a producer in Italy? Such an attempt could have run into difficulties since in antiquity there was no protection of trademarks, and no way of preventing forgery.⁴³ Nobody could have proved with the help of a stamp alone whether or not a poor-quality product was original. Therefore after some steps of intermediate trade it would have been impossible to sue a producer. On the other hand, most commodities in question were either not normally traded long distances (e.g. bricks and tiles) or were used only within a few stages of distribution (e.g. amphorae).⁴⁴ Thus a mark could have been used as an indication of the producer, and as a piece of evidence that could be backed up by the testimony of witnesses, e.g. traders involved in the trade of this very item.

In the case of Arretine ware the stamps could hardly have been regarded as more than a general proof of quality. This is shown by stamps which originate from Campania, but claim themselves as being Arretine.⁴⁵ Such stamps would have been from a legal point of view proof of fraud unless the attribute 'Arretine' had become synonymous with 'quality red glazed table ware'. Here stamps serve for a function which is very close to advertising. It is even conceivable that the very occurrence of stamps was seen as a sign of quality.⁴⁶ However, functions of this kind are in any case secondary ones, for they presuppose that stamped Arretine ware was already renowned for its quality. That is why stamps on original *terra sigillata* from Arezzo cannot have been introduced for such purposes.

The application of a stamp-based guarantee-system for tableware in general is unlikely for another reason. There is a fundamental difference between containers and building material on the one hand, and tableware on the other. Stability, intactness, and volume in amphorae, and material quality in bricks and tiles must be taken on trust. These commodities can look heavy-duty at first sight, and turn out to be defective when

³⁹ *ibid.*, 41–4.

⁴⁰ Steinby, *op. cit.* (n. 33, 1993), 139–43, stresses that the interpretation of brick stamps as abbreviated *locatio conductio* contracts excludes their use as part of a guarantee system. She supports her view by pointing out that bricks of very good and of very bad quality were stamped equally. In addition, the user would have had difficulties in deciphering badly applied stamps, abbreviated names, and stamps showing symbols. Thus Steinby suggests that the stamps were used in the context of production and distribution only (*ibid.*, 141).

⁴¹ Suggested by E. Rodríguez-Almeida, 'Graffiti e produzione anforaria della Betica', in Harris, *op. cit.* (n. 28), 95–105, esp. 99.

⁴² Manacorda, *op. cit.* (n. 28), 43; Aubert, *op. cit.* (n. 21), 264, 275, 300, and *passim*. Against the application of this assumption to *terra sigillata* G. Pucci, 'I bolli sulla terra sigillata: fra epigraphia e storia economica', in Harris, *op. cit.* (n. 28), 73–80, esp. 74.

⁴³ This problem occurs especially when products with identical stamps come from different places, as is the case in the trade of terracotta lamps. It is not possible to decide, if e.g. a provincial producer was a representative of the Italian main manufacturer whose

name occurs on provincial products, or simply made unauthorized imitations. Cf. on this problem Aubert, *op. cit.* (n. 21), 317. Cf. also F. Marino, 'Appunti sulla falsificazione del marchio nel diritto romano', *ZRG* 105 (1988), 771–5.

⁴⁴ On the use of amphorae Aubert, *op. cit.* (n. 21), 259–62.

⁴⁵ Pucci, *op. cit.* (n. 42), 75. SCOTTIVS FECIT ARETINVM, RVTENVVS FEC(it) ARETINVM (C. Bémont, A. Vernhet and F. Beck, *La Graufesenque, village de potiers gallo-romains, Catalogo della mostra* (1987), 24; A. Vernhet, 'Centre du production de Millau, Atelier de la Graufesenque', in C. Bémont and J. P. Jacob (eds), *La terre sigillée gallo-romaine. Lieux de production de Haut-Empire: implantation, produits, relations*, Documents de archéologie française 6 (1986), 100, respectively); ARRETINVM or even ARRET(inum) VERV(m) (*CVArr* 132); on the origin J.-P. Morel, 'Artisanat et colonisation dans l'Italie romaine aux IV et III siècles av. J.C.', *DialArch* 1988, 49–63.

⁴⁶ This is suggested by stamps which have no sense and show a kind of imitation of alphabetical characters (Pucci, *op. cit.* (n. 42), 75).

in use, so that a guarantee-system could have been a real advantage. This does not apply to tableware, whose qualities such as thickness of material, colour, smoothness and gloss, and fineness of relief are readily apparent. In addition, tableware was a serial product, therefore spot checks would have been sufficient. It is unlikely that anyone would purchase a large amount of reject tableware without realizing it, neither wholesale nor retail. A few low-quality vessels in a load are not likely to have led to legal action. Taking this into consideration, a stamp-based guarantee-system for tableware would have been superfluous.

It has been maintained that the involvement of members of the senatorial order in pottery manufacture led to the rule that all manufacturers must apply personal name stamps to their products to reveal their identity.⁴⁷ Since the famous Claudian plebiscite of 218 B.C. members of the senatorial order were not allowed to participate in wholesale trade, with the exception of agricultural produce. In 59 B.C. Caesar renewed and modernized this plebiscite by his *Lex Iulia Repetundarum*. This has been seen as the legal reason for the beginning of the use of stamps about the middle of the first century B.C. on Arretine black-glazed ware and its immediate successor, *terra sigillata*.⁴⁸ However, this interesting explanation does face the problem that the names on the stamps do not prove the supposed involvement of the élite.⁴⁹

At this point a short provisional appraisal seems reasonable. Regarding tableware, we have seen that the use of stamps as a supposed part of a system of guarantee or public control is either unlikely or does not match the evidence. Sales promotion is doubtless one idea behind some stamps, but in any case this is a secondary effect based on the success of Arretine ware marked for some other reason. Indication of ownership is applicable only insofar as a product belongs to its producer or to someone related to him until it is sold. This leaves us with the organization of production and distribution as a likely reason for the employment of stamps on *terra sigillata*.

The application of stamps was a common practice in the manufacture of *terra sigillata* in Italy. Indeed, far more than 90 per cent of finds are stamped.⁵⁰ Unlike in Gaul or Spain, stamps were applied to vessels of any shape.⁵¹ Various explanations have been offered for this. The stamps have been considered as a means of controlling the production of subordinates, e.g. of slaves and/or freedmen working for one master or patron respectively.⁵² Identifying stamps would also have been useful in the organization of related activities beyond the workshop. Firing, for instance, could have been organized independently of throwing. This happened in La Graufesenque in Gaul,⁵³ as well as in Torrita di Siena in Etruria, where products of various potters, who did not belong to the same *familia*, were fired all at the same time in the one kiln.⁵⁴ In connection with this the sharing of costs amongst the potters is conceivable.⁵⁵ Firing is a very complicated process with part of the load frequently becoming spoiled. Immediate identification of the potter landed with the rejects was surely very useful indeed. When an entire firing was sold, stamped vessels would have made the potters' share out of the proceeds much easier. If the owner of the kiln was the entrepreneur, the stamps could have facilitated the payment of individual potters.⁵⁶ After all, the stamps, of course, could have had various functions at once.

⁴⁷ cf. Pucci, *op. cit.* (n. 42), 73-9.

⁴⁸ L. Pedroni, 'La scomparsa dei bolli sulla ceramica a vernice nera', *Samnium* 61 (1988), 1-17.

⁴⁹ Pucci, *op. cit.* (n. 42), 73-4. According to another suggestion by Pedroni (*op. cit.* (n. 48)) the plebiscite of 218 B.C. had the opposite effect, namely the disappearance of stamps that were applied on black-glazed ware from Campania in the third century B.C. The manufacturers are suspected of having dropped the use of stamps in order to conceal certain commercial activities that had been forbidden by the law. There is, however, no evidence for this assumption, which could in any case not explain why stamps were used in this period (Pucci).

⁵⁰ Pucci, *op. cit.* (n. 42), 74.

⁵¹ *ibid.*

⁵² *ibid.*, 74-5.

⁵³ Peacock, *op. cit.* (n. 16), 125-6; R. Marichal, 'Nouveaux graffites de la Graufesenque', *REA* 76 (1974), 84-110 and 266-99, esp. 272-3; K. Strobel, 'Einige Bemerkungen zu den historisch-archäologischen Grundlagen einer Neuformulierung der Sigillatenchronologie für Germanien und Rätien und zu wirtschaftsgeschichtlichen Aspekten der römischen Keramikindustrie', *MBAH* 6 (1987), 75-115, esp. 100-11.

⁵⁴ G. Pucci, 'A sigillata kiln in Valdichiana (Central Etruria)', *RCRF* 27/28 (1990), 15-23; *idem*, *La fornace di Umbricio Cordo* (1992).

⁵⁵ Pucci, *op. cit.* (n. 42), 75.

⁵⁶ *ibid.*

B. Forms of Stamps

The first stamps on Roman table ware showing names occur on black-glazed vessels between the end of the fourth and the beginning of the third centuries B.C., produced in northern Campania and Latium. However, the use of stamps was abandoned by the end of the second century; and in any case we do not have enough information to make more than very vague conjectures about the reasons for that development.⁵⁷ In the second half of the first century B.C., however, name stamps recurred on Arretine black-gloss vessels, the predecessors of red *terra sigillata*.⁵⁸ Typical stamps on black ware originally showed ornaments only, whereas name stamps were customary on later red ware. In the period of transition, initials were included in ornamentation; mixed stamps, both purely ornamental stamps, and simple name stamps (i.e. mostly abbreviated forms such as initials), were used at the same time on both black and red vessels. Although names became the main content of *terra sigillata* stamps, some of them show additional ornamentation in later periods too.⁵⁹ The time of the change from ornamental to name stamps is not exactly datable, but several indications lead to the conclusion that it took place around 30 B.C.⁶⁰

The stamps were placed on the inside base of plain ware, whilst on moulded ware they were integrated into the decoration, i.e. negative forms of stamps were pressed into the mould. The way of stamping plain ware changed over time.⁶¹ In the earliest, pre-Augustan period, smaller vessels have a single centrally placed stamp, whilst platters of larger dimensions bear multiple radially arranged stamps, sometimes with an additional central one. The shape of these small stamps is more or less square. About 15–10 B.C. the exclusive use of a single, centrally-placed stamp with a rectangular shape replaced the former method.⁶² The larger stamp allowed space for two lines of text. Soon after A.D. 9 a further change occurred, when the frame took the shape of a human footprint (*in planta pedis*).⁶³

The shape and size of the stamps influenced the content in the sense that we find longer and less abbreviated name forms in the larger stamps, whereas in the smaller rectangular ones and especially *in planta pedis* stamps the name forms tend to be short and very abbreviated.

This tendency is not the only cause of problems of interpretation. More difficulties arise from the occurrence of round stamps with a circle inscription; from stamps on moulded ware which are integrated into the decoration; and from rectangular stamps which are written from the bottom to the top. Interestingly, in the latter case the words are written as usual from left to right.⁶⁴ This makes it impossible to conclude from the direction of writing whether the inscription is to be read from the top to the bottom or vice versa. On moulded ware, stamps are often integrated into the decoration, in which case parts of the name can become separated. This makes it impossible to decide which word-order is intended. The same problem occurs in the reading of round stamps with circle inscriptions, where we often do have no clue as to which word or abbreviation is to be the first one. These ambiguities in reading cause difficulties, because the order of parts of a name is crucial for its interpretation, as we shall see below.

⁵⁷ For stamps on black-glazed ware and related theories cf. now Pucci, *op. cit.* (n. 42), 73–4.

⁵⁸ G. F. Gamurrini, 'Di una nuova figulina di vasi neri e rossi, scoperta all'Orciolaia presso Arezzo', *NdS* 1890, 63–72, esp. 68–70. Cf. also *SFAS*, 213 with n. 119.

⁵⁹ e.g. *CVArr* 2360, 2333, 2346.

⁶⁰ Peacock, *op. cit.* (n. 16), 115.

⁶¹ cf. on these questions P. M. Kenrick, 'Potters'

stamps', in E. Ettliger *et al.*, *Conspectus Formarum Terrae Sigillatae Italico Modo Confectae*, Materialien zur Römisch-Germanischen Keramik 10 (1990), hereafter referred to as *Conspectus*, 147–8.

⁶² cf. *SFAS*, 2–3.

⁶³ Kenrick, *op. cit.* (n. 61), 147.

⁶⁴ The opposite direction of writing is rare, but not unknown on stamps from Arezzo, cf. the stamps EROS AVILI and LIVA/EROS (*CVArr* 241).

C. Names on Stamps and Status of Persons Referred To

Generally we can distinguish name forms which are clearly names of either freeborn or freedmen; those where it is debatable whether they represent freedmen or slaves; and those which are definitely names of slaves. Names occur on the stamps in different grades of abbreviation, from simple initials to names in full length, i.e. in the case of freeborn or freedmen *tria nomina*, including specification of social status (filiation, or abbreviated mentioning of the former master's name in freedmen's cases). The latter occurs rarely, and the interpretation of very abbreviated forms is always a matter of the individual case.

The slaves' name forms consist of the slave's given name⁶⁵ plus the names of the slave's owner,⁶⁶ sometimes followed by the abbreviation 'S' for *servus* indicating servile status. On the basis of both literary and epigraphic evidence Oxé worked out how typical abbreviations and combinations of names should be interpreted.⁶⁷ So we are able in most cases to infer social status from the combination of name parts. Only a very few forms are still a matter of discussion, it being unclear as to whether they represent slaves or freedmen. As to some name forms, the argument that some persons with names appearing in these forms also used freedmen's name forms, runs up against the point that some of the name forms in question are followed by the abbreviation 'S', which should mean *servus*.⁶⁸ We do not know if the positively known freedmen used these forms while still slaves, or later on as freedmen, so the first argument is not very strong. In another case, the evidence of stone inscriptions with freedmen using the name form in question is against the interpretation of just one stamp bearing this name form plus the alleged abbreviation 'STA' as referring to a *statuliber*, a conditionally manumitted

⁶⁵ I have decided to use the term 'given name', since alternative ones such as 'forename', 'first name' or 'Christian name' depend for their meaning on modern name systems, whereas the terms *praenomen* or *cognomen* refer to the *tria nomina* system used for free Roman citizens. The neutral 'slave name' means in this context the full form including the master's name. By contrast, the term 'given name' reflects the fact that a slave was called by a name of his master's choosing. This could be either what he was called before enslavement, or a new name issued at random by his master. The best modern equivalent would probably be the German *Rufname*, i.e. the name by which one is usually called. In addition, the use of the term *cognomen* for a slave's given name would lead to the existence of name forms with two *cognomina*, since some forms of slaves' names contain the master's *tria nomina*. Cf. the terminological confusion in Aubert, op. cit. (n. 21), 220–2, where 'slave name', 'personal name', and *cognomen* are all used when referring to a slave's given name. Such a complication can easily be avoided by the consistent use of the suggested term 'given name' for the name component in question.

⁶⁶ i.e. either *nomen gentile* alone, *cognomen* alone, *nomen gentile* with *cognomen*, *duo nomina*, or *tria nomina*.

⁶⁷ A. Oxé, 'Zur älteren Nomenklatur der römischen Sklaven', *RhM* 59 (1904), 108–40.

⁶⁸ The name forms in question are: master's *nomen gentile* in the genitive + the slave's given name, e.g. Aureli Eros, and master's *duo nomina* in the genitive + the slave's given name, e.g. L. Aureli Eros. Oxé, op. cit. (n. 67), 135–40, tentatively considered that these forms refer to freedmen stressing there were no indications that the forms represent slaves or

refer to two persons. He backed his interpretation by using the fact that some persons, whose names appear on these stamp-types, are also encountered on stamps which positively show that freedmen are meant, e.g. L.TITI/THYRSI and L.TITI L.L/THYRSI. The stamp P.MESEINV(s)/AMPHIO.S proves that the usually abbreviated second name is not always in the genitive, and that therefore an interpretation like (*ex figlinis*) Cn. Atei, Hilarus (*fecit*) can be discounted. He did, however, not discuss the meaning of the abbreviation 'S' on this stamp, which normally indicates servile status. Recently Aubert, op. cit. (n. 21), 288, renewed the interpretation of these name forms as (*ex officina*) Cn. Atei, Hilarus (*fecit*), but without convincing arguments. The point that in the stamp A.TITI/FIGVL/ARRET the last abbreviation should be read as the name Arretius, who would have been an employee of the *figulus* A. Titius is not conclusive. FIGVL(us) could have been a job title, or the *cognomen* of A. Titius (cf. also O. Salomies and H. Solin, *Repertorium nominum gentilium et cognominum Latinorum*², Alpha-Omega 80 (1994), 322; I. Kajanto, *The Latin Cognomina*, CHL 36.2 (1965), 322. On job titles as *cognomina* cf. *ibid.*, 82–4. See also Section VI.B below). Furthermore, other plausible readings of ARRET are easily possible, e.g. as a reference to the place of origin of the vessel. Aubert's second example, the exceptional stamp L.SEMPR/L.GELLI, has nothing to do with the forms in question and should, therefore, be discussed separately. Anyhow, the occurrence of stamps with additions like *ex officina* or *fecit* in brick production, or in the Gaulish *terra sigillata* trade, cannot be used as a basis for the reading of stamps of producers from Arezzo without having additional clues.

slave, but still a slave.⁶⁹ In my opinion, the evidence available is not sufficient to make a clear decision as to whether freedmen or slaves are referred to in these cases.

Another problem in this context is that — as we have seen above — it is often impossible to find out the word-order intended on some kinds of stamps, or in the case where names are integrated into the decoration of moulded vessels. This often foils unambiguous assignment of a name on a vessel to a name form that is related to a particular social status.

On the other hand, single-name⁷⁰ stamps offer much less information and are, therefore, especially problematic. We can distinguish single-name stamps with a *nomen gentile* from stamps with a *cognomen* or a given name. In the former case we can be sure that the mentioned person is free, i.e. freeborn or freed. When a *cognomen* or a given name occurs alone on a stamp, it is in fact impossible to determine the social status of the person referred to, unless we have other stamps with the name in question, as part of more complex name forms. If additional hints support the assumption that the same person is referred to by both kinds of stamps, a chronology of that person's production in relation to the use of different name forms would help.⁷¹

Sometimes additions to the names, such as abbreviations of various kinds, occur on stamps. In an especially interesting case such additions have led to the attempt at establishing a slave's career. The abbreviation 'PR' on the stamp DIOMED(es)/VIBI.PR⁷² was considered as referring to a *procurator*, and Diomedes consequently regarded as a slave *procurator* of Vibius.⁷³ However, this reading is not cogent. Diomedes could also have been owned by another person referred to by VIBI. PR. We know for example a slave named Primus L. Vibi.⁷⁴ He could have been the owner in question, possibly at a later stage in his life, after liberation. The occurrence of the stamps DIOMED(es)/VIBI.<⁷⁵ and DIOMED(es)/VI[b]I ⊙⁷⁶ led to the assumption that Diomedes could have been a *contrascriba*, the obscure additions being interpreted as an inverted 'C'.⁷⁷ However, there are no examples in stone inscriptions for 'C' as an abbreviation of *contrascriba*. Possibly < and ⊙ are not abbreviations at all, but ornaments.⁷⁸ On the stamps of Diomedes and of Primus ornaments often occur, mostly behind the last name on the stamp.⁷⁹ Therefore, the reconstruction of the shadowy career of Diomedes is so questionable that one should dispense with it.

⁶⁹ Master's *tria nomina* in the genitive + the slave's given name, e.g. L. Aureli Cottae Eros. Oxé, op. cit. (n. 67), 139–40, mentions stone inscriptions proving that freedmen did indeed use this form, sometimes with additional indication of status. In one of these inscriptions (CIL II 2093) we find L. VALERI LAETI (et) M. VALERI VETVSTI LIBERTVS VERNA (et) M. VALERI VETVSTI PRIMA VERNAE VX(or). Verna and Prima, both typical slave names, also encountered on Arretine stamps (cf. SFAS, 230), are evidently given names of two freedmen, who used their patrons' *tria nomina* in the genitive, and before their given names, although they were freed. Prachner, SFAS, 168–9, 207–8, 211, explained the very obscure stamp LVMSC/NOSTA (CVArr 2412) as L. Um(brici) Sc(auri) No(thus) Sta(tuliber). However, the solution of STA as *statuliber* is not at all positive — the abbreviation does not appear in stone inscriptions, but only on Arretine *terra sigillata* stamps. In three other cases (CVArr 2040, 2042, 2044) the abbreviation STA or ST follows the *nomen gentile* of the master and could be read as an abbreviation of the master's *cognomen* (on the large number of *cognomina* beginning with 'Sta' see Salomies and Solin, op. cit. (n. 68), 407 and 504). The objection that this is not very likely, since we do not have an independent stamp with such a master's name

on its own, which is the usual case, is based on the premise that the master of a slave working in pottery production must have been also involved in it (cf. SFAS, 151 with n. 1). This was not necessarily so, because slaves could act economically independently from their master, e.g. for third parties for payment to their master, as is shown below in Section VI.A. We do not know, for instance, a single master's stamp of the large group of dependants of Publius (CVArr 1414–45).

⁷⁰ The term 'single-name' means here stamps containing a single component of a complete name form only, e.g. given name on its own, or *cognomen* alone, or *nomen gentile* alone, etc.

⁷¹ This suggestion was made by Prachner (SFAS, 205), who adds that such unequivocal and datable sets of stamps are not yet available.

⁷² CVArr 2343.

⁷³ SFAS, 157.

⁷⁴ CVArr 2360b.

⁷⁵ CVArr 2344.

⁷⁶ CVArr 4345.

⁷⁷ SFAS, 157–8.

⁷⁸ This interpretation was suggested by M. Steinby (oral communication).

⁷⁹ e.g. CVArr 2360a and b, 2333, 2346.

To sum up, since we often cannot decide conclusively whether a person referred to is slave or freedman, I use the term 'dependant's stamp' for slaves' stamps, freedmen's stamps, and for those whose social status is debatable, when this is of no significance for the theme being dealt with.

V. ORGANIZATION OF PRODUCTION OF OTHER KINDS OF MASS-PRODUCED POTTERY

Before proceeding to the discussion of the function of the various individuals referred to on Arretine *terra sigillata* stamps, it is necessary to look at the organization of the production of other mass-produced pottery artefacts, about which we are better informed, such as amphorae, and bricks and tiles. The structures encountered there may help us to develop an explanation of the pattern which we find in Arretine *terra sigillata* manufacture.

We know some details of leasing contracts of Egyptian potteries of Oxyrhynchus from three leases that have survived on papyri from the mid-third century A.D.⁸⁰ The potters leased a pottery or a part of it for a certain length of time.⁸¹ The potteries belonged to the owner of the land where they were situated. The lessor provided the pottery, including all necessary tools, plus all requisite raw material such as clay, water, pitch, and fuel; the lessee provided potters, assistants, and stokers. He undertook to produce an agreed number of various types of wine-jars. The work was paid for in cash as well as in kind, set amounts for set numbers of vessels. These pottery yards did not necessarily consist of a single production unit, but could be a complex of production installations with several kilns.⁸² They were very often leased in parts, from one third up to one fourteenth of a pottery are found as objects of leases in the papyri, thus suggesting that these pottery yards were divided into independently working sub-units.⁸³ In one lease, the potter was allowed to produce more than the agreed number, provided the lessor supplied the necessary raw material.⁸⁴ After the termination of the lease the lessee had to return the pottery or part thereof in good condition. The lessee in two of the leases was a slave of the pottery's owner.⁸⁵

Papyri from the second century A.D. show that this kind of lease contract was not the only one. We learn from a contract from a village in the Hermopolite nome that two partners leased a pottery for seven months and three years.⁸⁶ Unlike the third-century leases from Oxyrhynchus, here the lessees had to supply the raw material themselves. The necessary clay pits were part of the leased means of production. The rent consisted of an unknown number of amphorae. Another variant is found in a fragmentary second-century papyrus from the Oxyrhynchite nome, in which an unknown part of a pottery was leased against monthly payment in cash.⁸⁷ The lessee was responsible for the payment of the tax for brick production, which shows that he was in full charge of the running of the pottery, so that we can assume that the pottery itself was the subject of the lease.⁸⁸

⁸⁰ *P.Oxy.* L 3595-7. Cf. for L 3595 H. Cockle, 'Pottery manufacture in Roman Egypt', *JRS* 71 (1981), 87-97; for all three papyri J. Hengstl, 'Einige juristische Bemerkungen zu drei Töpferei-Mieturkunden', *Studi Biscardi* IV (1983), 663-73; Strobel, op. cit. (n. 53); H.-J. Drexhage, *Preise, Mieten/Pachten, Kosten und Löhne im römischen Ägypten bis zum Regierungsantritt Diokletians. Vorarbeiten zu einer Wirtschaftsgeschichte des römischen Ägypten* (1991); Aubert, op. cit. (n. 21), 253-6.

⁸¹ In *P.Oxy.* L 3595 a whole pottery was leased for two years. In *P.Oxy.* L 3596 one quarter of the pottery in question was leased for one year, in *P.Oxy.* L 3597 one third for the same period. From a later papyrus, *P.Lond.* II 944 (A.D. 517), we learn that up

to one fourteenth of a pottery could be a subject of a contract; *P.Cairo Masp.* I 67110 (A.D. 565) shows that a lease could be concluded for life.

⁸² *P.Oxy.* L 3597. For details see Strobel, op. cit. (n. 53), 94.

⁸³ cf. n. 81.

⁸⁴ *P.Oxy.* L 3595.

⁸⁵ *P.Oxy.* L 3596-7. See for details Strobel, op. cit. (n. 53), 94.

⁸⁶ *P. Tebt.* II 342. Cf. for details Strobel, op. cit. (n. 53), 96; Drexhage, op. cit. (n. 80), 91-2.

⁸⁷ *P. Mert.* II 76. See for details Strobel, op. cit. (n. 53), 96.

⁸⁸ Strobel, op. cit. (n. 53), 96.

These leases present in fact different types of contracts, which were dealt with by the Roman jurists as one single type, the *locatio conductio*.⁸⁹ Although the unity of the *locatio conductio* was not given up, the jurists distinguished between three different sub-types. In the case of a labour contract, a *locatio conductio operarum*, the owner of the means of production hired as the *conductor* the labour as well as the technical and managerial skills offered by the *locator*. All raw materials and tools were provided by the former, the finished products also belonged to him. The object of the contract was only the labour, which was paid for by a rent, a *merces*, in cash and/or kind. The objects of a lease contract, a *locatio conductio rei*, were production facilities. Here, the products were the property of the *conductor*, who had to pay a rent to the owner of the facilities, the *locator*, in which the latter had no say in the running of the production. A third possibility is that the means of production were owned by the contractor himself, whereas the raw material was provided by the client, to whom in the end the finished products belonged. The latter as *locator* placed out the work to be done and paid the *conductor* for the undertaking. Such a contract of work, a *locatio conductio operis faciendi*, could be combined with a *locatio conductio rei*, insofar as the means of production provided by the contractor could be leased.

The second-century contracts are evidently lease contracts; the object of them the means of production. As to the three third-century contracts, it is debatable which kind of *locatio conductio* is used.⁹⁰ The idea of a *locatio conductio operis faciendi* is disputable because in all cases the pottery did not belong to the contractor, but to the client. However, the set number of certain types of vessels as a subject of the contract must be remembered. It has been argued by Aubert that the contract which allowed the potter to produce more than the agreed number of vessels should not be considered as a contract of labour, because the potter was according to Aubert's interpretation allowed to work for his own profit.⁹¹ This would constitute the difference between a *locatio conductio rei* and a *locatio conductio operarum*. In the former, the potter as *conductor* would have rented the pottery and could have produced as much as he wanted to. In that case we should have to consider the set number of vessels to be produced as a kind of rent. However, the question arises, why did the *conductor* receive payment for these products? In addition, it is doubtful if the passage in question really allowed the potter to produce as much as he wanted, because obviously he depended on the lessor for his supply of raw materials. The other two contracts do not mention the possibility of production for the potter's own profit; these contracts can therefore be seen as labour contracts.

Locatio conductio contracts, which contain elements of different sub-types, are not at all exceptional and occur in many fields of legal action.⁹² Consequently, we must expect all three kinds of *locatio conductio* contracts; separate, combined with each other, and mixed variants, in the area of pottery production.

A concentration of a number of workshops producing the same type of artefacts such as we meet in the case of Oxyrhynchus has been classified by Peacock as nucleated workshop industry, where individual workshops are grouped together to form a clustered industrial complex. Pottery making is the potters' most important economic activity, and every available technical aid will be used to produce a fairly standardized range of high-quality products. Co-operation is very likely and perhaps the most

⁸⁹ cf. the comprehensive treatise on the *locatio conductio* by M. Kaser, *Das römische Privatrecht*², *HdAW* 10,3,3 (1971), I, 562–72.

⁹⁰ Strobel, *op. cit.* (n. 53), 95, follows Hengstl, *op. cit.* (n. 80), 665–8, in considering the contracts in question as a 'handwerksspezifische Variante der hellenistisch-römischen Werkverträge'. By contrast, Drexhage, *op. cit.* (n. 80), 98, pleads for contracts of

labour, because the subject of the contract is according to him 'eine festgelegte Arbeitsleistung in einer festumrissenen Zeit'. However, Aubert, *op. cit.* (n. 21), 254, excludes this option, on the ground that the potter was allowed to work for his own profit.

⁹¹ Aubert, *op. cit.* (n. 21), 254.

⁹² Kaser, *op. cit.* (n. 89), 564; Hengstl, *op. cit.* (n. 80), 668–70.

important advantage. The scale of production will attract middlemen.⁹³ The question arises whether this kind of organization of production can be extrapolated to other fields of pottery production and to other periods. With this aim in view, the model of nucleated workshop industry can be tested against evidence available from other periods and areas of pottery mass production.

Spanish oil amphorae of the type Dressel 20 — produced in vast quantities from Augustan times to the late third century in the Baetica — offer epigraphical information in the form of stamps, graffiti, and painted inscriptions (*tituli picti*).⁹⁴ Stamps on the amphora itself were applied before firing and must be seen, therefore, in the context of production, whereas stamps on the stopper and *tituli picti* refer to the phase of distribution. Graffiti were applied *ante cocturam* and *post cocturam*, and could contain names, numbers, and symbols. Those graffiti which were applied *ante cocturam* might refer to the internal organization of production, and were most likely used by foremen or supervisory personnel.⁹⁵ Stamps on the amphorae themselves show mainly more or less abbreviated personal names, often in combination with the name of the *figlinae* (pottery yard, brickyard).⁹⁶ However, the role of the persons who are represented on stamps is still a matter of discussion. The majority of amphorae researchers tend towards an interpretation of the persons represented on stamps as owners of the *figlinae*.⁹⁷ Since these persons often belong to the highest social strata including the emperor and his *familia*, it is certain that they themselves were not normally involved in the process of production. This means it is impossible to gain an insight into the internal organization of production on the basis of this evidence. However, there are some exceptions which are worth discussing.

In a few cases, additional personal names are to be found besides the name of the *figlinae* and its owner on stamps from the second and third centuries. These names are combined with the abbreviation COL, which has been convincingly interpreted as *colonus*.⁹⁸ The *coloni* have been explained as 'fermiers qui avaient pris à leur compte . . . l'exploitation des *figlinae*'.⁹⁹ From other stamps we learn that a sub-unit of a *figlinae*

⁹³ Peacock, *op. cit.* (n. 16), 9. Peacock, *ibid.*, 11, also suggests a category of 'dispersed manufactory', i.e. the production of a certain product not in a single building, but at the workers' home, a production which requires full-time occupation of the artisans and is centrally organized by the proprietor, who provides materials, sets standards, and buys back the finished product. However, as far as antiquity is concerned it would be extremely difficult to decide whether or not a nucleated workshop industry should be considered a dispersed manufactory. First, in most cases it is impossible to gain a sufficiently deep insight into the legal organization of the production, which is essential for a well-founded decision. Second, even when we have this insight, it can still be difficult to make this decision. For instance, in the case of the Oxyrhynchus papyri only the third-century contracts meet the requirements of this definition without a doubt. In the second-century contracts the problem occurs that the lessee could possibly sell the products himself, when he had paid the rent in kind, or even paid it in money respectively. In addition, he had to lease the source of raw material. The assignation of the production to a certain category would, therefore, depend only on the respective type of *locatio conductio*. The three theoretically separated types any of which in reality can occur separately, combined with each other, or in mixed variants, which makes it very difficult to find a modern equivalent. Archaeologically no difference can be seen. Third, in most cases of large-scale pottery production in antiquity it is difficult to say if the workshop should be considered the home of the artisan, especially when slaves were involved. In addition, the term manufactory is normally related to the definition given above in Section

III, especially to a sub-division of labour higher than in a common workshop. Taking these observations into consideration, the concept of 'dispersed manufactory' does not really seem to be a useful category for the classification of pottery mass production in antiquity.

⁹⁴ For a recent critical reassessment of various interpretations of these inscriptions cf. Liou and Tchernia, *op. cit.* (n. 30), 133–56.

⁹⁵ Rodríguez-Almeida, *op. cit.* (n. 41).

⁹⁶ On the content of the stamps cf. M. H. Callender, *Roman Amphorae with Index of Stamps* (1965), xxvi–xxvii; Manacorda and Panella, *op. cit.* (n. 30), 55–64; Liou and Tchernia, *op. cit.* (n. 30); Aubert, *op. cit.* (n. 21), 246–8. On the meaning of the term *figlinae* cf. T. Helen, *Organization of Roman Brick Production in the First and Second Centuries A.D.*, *Annales Academiae Scientiarum Fennicae, Dissertationes humanarum litterarum* 5 (1975), 33–88 (meaning according to Helen: clay district); against this interpretation Steinby, *op. cit.* (n. 33, 1986), 99–164, esp. 156–7, and eadem, *op. cit.* (n. 33, 1993), 141 (meaning: brickyard ('le *figlinae* non sono semplici cave di argilla. . . , bensì organizzazioni produttive')). Cf. also Aubert, *op. cit.* (n. 21), 236–8.

⁹⁷ Liou and Tchernia, *op. cit.* (n. 30), *passim*; Manacorda, *op. cit.* (n. 37), 150–5; D. P. S. Peacock and D. F. Williams, *Amphorae and the Roman Economy — An Introductory Guide* (1986), 9–10; Aubert, *op. cit.* (n. 21), 247–9.

⁹⁸ On these stamps and their interpretation Liou and Tchernia, *op. cit.* (n. 30), 147–8, with literature and a critical reassessment of other suggestions.

⁹⁹ Liou and Tchernia, *op. cit.* (n. 30), 147.

could be an *officina*.¹⁰⁰ This has led to the suggestion that the model known from the interpretation of Roman brick stamps be applied to Spanish amphorae production, i.e. to postulate the sub-division of an amphora pottery yard into several workshops (on brick production cf. below).¹⁰¹

Rodríguez-Almeida has suggested that five or more *ateliers* shared one firing and storage installation.¹⁰² This suggestion is reinforced by the fact that at some production places quite a number of different producer stamps were found, the most impressive example being the locality of La Catria, where on a site of c. 20 ha c. 600 stamped Dressel 20 handles with c. 80 different texts were found. Even if one takes into consideration that these stamps represent a production activity of more than two centuries, the interpretation of this area as a vast concentration of pottery workshops is convincing, especially since a kiln has been discovered.¹⁰³ The use of stamps is hence explained as being necessary for the separation of the products of each *atelier* after firing, rather than other explanations.¹⁰⁴

Locatio conductio contracts, such as in Egypt, would nicely meet this situation,¹⁰⁵ as does the model of nucleated workshop industry.

Italian amphorae also bear stamps of free and unfree persons, who have been interpreted as owners or lessees of a pottery yard, or as slave *officinatores* respectively.¹⁰⁶ Again we encounter the situation that more than one *offinator* was attached to the same yard. In the first century A.D. some twenty-nine names of persons, who have been identified as *vilici* or *officinatores*, were associated with the amphora production of one C. Laecanius Bassus in the region of Pola in Istria.¹⁰⁷ Fourteen of them were encountered at a production site discovered near Fasana, eight kilometres north of Pola, six at Val San Pietro, where a dump was found, the rest elsewhere.¹⁰⁸ If one reckons with a period of production of three or four decades,¹⁰⁹ not all known persons would have been active all the time. This evidence suggests that these *officinatores* were active in different workshops belonging to C. Laecanius Bassus, perhaps half a dozen or even less simultaneously at the main site near Fasana. Some of them are not encountered on stamps together with Laecanius at all; here only the fact that they were active at Fasana, the type of amphora, or the form of the stamp indicate that the persons in question could have been connected with Laecanius. Tassaux proposes that they were working independently 'pour leur compte';¹¹⁰ in this case the use of lease contracts is very likely.

A similar case is the one of the amphora producer Visellius, active in the *ager Brundisinus* during the second half of the first century B.C.¹¹¹ At the site in question near Giancola apart from Visellius some twenty-five persons are attested, only a few of them clearly related to Visellius, while for others a relationship is only hypothetical.¹¹² Four of these persons, understood by Manacorda to be slaves of Visellius, each have a share

¹⁰⁰ cf. C.I.N. EX OF / L. LIC. MAG (CIL xv 2972, 3471).

¹⁰¹ Liou and Tchernia, op. cit. (n. 30), 145.

¹⁰² Rodríguez-Almeida, op. cit. (n. 41), 98.

¹⁰³ On La Catria and the interpretation of the finds cf. Liou and Tchernia, op. cit. (n. 30), 145-7, referring to J. Remesal-Rodríguez, 'La economía oleícola bética: nuevas formas de análisis', *Archivo Español de Arqueología* 50-1 (1977-78), 87-142, the same article in German: 'Die Ölwirtschaft in der Provinz Baetica: neue Formen der Analyse', *Saalburg-Jahrbuch* 38 (1982), 30-71.

¹⁰⁴ Rodríguez-Almeida, op. cit. (n. 41), 99.

¹⁰⁵ This has already been pointed out by Strobel, op. cit. (n. 53), 97-100.

¹⁰⁶ Manacorda, op. cit. (n. 37), 150-5.

¹⁰⁷ F. Tassaux, 'Laecanii. Recherches sur une famille sénatoriale d'Istrie', *MEFRA* 94 (1982), 227-69, esp. 254-7. Aubert, op. cit. (n. 21), 257-8, has obviously misunderstood the table of persons given by Tassaux, for he misinterprets all persons as slaves attached to the workshop near Fasana. Tassaux, however, says that some of them were more probably freedmen, and only fourteen were active at the site near Fasana.

¹⁰⁸ Tassaux, op. cit. (n. 107), 255-6.

¹⁰⁹ cf. Aubert, op. cit. (n. 21), 257.

¹¹⁰ op. cit. (n. 107), 257.

¹¹¹ D. Manacorda, 'Produzione agricola, produzione ceramica e proprietà della terra nella Calabria romana tra Repubblica e Impero', in *Epigrafia della produzione e della distribuzione. Actes de la VII^e Rencontre franco-italienne sur l'épigraphie du monde romain (Rome, 5 à 6 juin 1992)*, Collection de l'École française de Rome 193 (1994), 3-59, esp. 4. The identification of Visellius as the owner of the *fundus* on which the kiln site was located is valueless as long as it rests exclusively on the amphora-stamps. As it stands, Visellius could have been merely the owner or lessee of the kiln site itself, or a contractor. The same applies to attempts to identify Visellius as a member of the urban élite. As long as we do not know his *cognomen* we cannot be sure that he was more than a freedman, or even a descendant of a freedman of a forefather of the Visellii we know from other sources.

¹¹² Manacorda, op. cit. (n. 111), 5. The connection with Visellius is epigraphically attested for only four persons, cf. D. Manacorda, 'Le fornaci di Visellio a Brindisi. Primi risultati dello scavo', *Vetera Christianorum* 27 (1990), 375-415, esp. 381 n. 21.

of ten to fifteen per cent of the overall number of stamps. In another group of four, each has a share of more than five per cent.¹¹³ This also suggests that the persons mentioned on the stamps were more than just potters.

Manacorda interprets the production side as a 'vera e propria manifattura'.¹¹⁴ This assumption rests on the size of the two kilns and on the architectonic typology of the establishment. The latter means that the firing chambers of the two excavated kilns were accessible only from a court which had no passage to the area at the rear side of the kilns, from where the combustion chambers were fired. Manacorda considers this as proof of a remarkable organization of space, which enabled the independent activity of two different parts of the workforce, namely the potters and the firing specialists. From this he infers a form of sub-division of work typical of the production mode of manufactories.¹¹⁵

However, the filling and the firing of a pottery kiln are of course successive processes. The firing of a kiln of that size including the slow cooling-down of the amphorae after the firing process must have taken one to two weeks.¹¹⁶ While the amphorae cooled down the next firing could have been prepared. In the court in question no installations for pottery production such as turntable pivots or levigation basins were found, so it was most likely used as a storage area for amphorae ready for firing, as Manacorda suggests for a sheltered part of it.¹¹⁷

Taking these facts into consideration, the place offers no space for potters at all. The entire area in question seems to have been nothing but the firing installation itself. Its division into two parts, firing area with storage place, and combustion place, is easy to explain by the organization of the firing itself. The surroundings of the combustion chambers were surely polluted and needed in any case for the storage of a large amount of fuel. In most potteries this area is separated from the throwing and production storage area for these very reasons.¹¹⁸

Kilns of comparable size were used by workshops forming a typical example of nucleated workshop industries on the isle of Djerba. These kilns could contain up to 160 amphora-like oil jars, which were considerably larger than the amphorae produced at Giancola.¹¹⁹ Each of the two kilns of Giancola must have had room for 120–180 amphorae, depending on how they were stored in the firing chamber.¹²⁰ In Djerba the kilns were built by the potters themselves, perhaps with the assistance of a kiln specialist. Taking this evidence into consideration, one should consider revising the common assumption that a big kiln must have been a considerable investment. In fact, the making of a kiln and adjacent buildings must have been a comparatively simple operation, and most appurtenances needed for pottery production could be made of clay and fired in a small temporary kiln. Only the natural raw material and an experienced potter with some assistance was necessary to build a large kiln site.

The kilns of Giancola could have been shared by a number of independently working workshops, thus making up a nucleated workshop production. Indeed, the presence of quite a number of *officinatores* suggests a vertical splitting of the workforce, not a horizontal one, which would be typical of a manufactory. Each *officinator* obviously had the same responsibility: the completion of the vessel before the firing, and possibly the internal coating of the fired vessel. The existence of two groups of four potters with a comparable above-average share of the overall production suggests that this was the

¹¹³ Manacorda, op. cit. (n. 111), 5.

¹¹⁴ Manacorda, op. cit. (n. 112, 1990), 384.

¹¹⁵ *ibid.*, 380–5.

¹¹⁶ The firing of a kiln filled with 160 amphora-like oil jars on the isle of Djerba, which were considerably larger than the amphorae produced at Giancola, took about ten to fifteen days (Peacock, op. cit. (n. 16), 42, quoting J. L. Combès and A. Louis, *Les potiers de Djerba* (1967)).

¹¹⁷ Manacorda, op. cit. (n. 112, 1990), 380.

¹¹⁸ cf. the plans of modern potteries Peacock, op. cit. (n. 16), 30, fig. 11, especially the plan of a pottery in

Orei, Euboea, Greece (fig. 11,2), with two wheels, where the arrangement of the firing area is very similar to the installations at Giancola.

¹¹⁹ Peacock, op. cit. (n. 16), 41–3, quoting Combès and Louis, op. cit. (n. 116).

¹²⁰ 120 if the amphorae were fired standing upright; 180 if they were fired in three layers (it is likely that more layers would have led to breakages among the unfired heavy vessels). On the size of the kilns Manacorda, op. cit. (n. 112, 1990), 378 n. 11, for the size of the amphorae cf. *ibid.*, figs 8 and 9.

normal number of units. The rest could have been made up by seasonally employed *officinatores*, e.g. in peak times.

A second production site has been discovered near Marmorelle where persons related to Visellius were active, some of them also being encountered in Giancola.¹²¹ This commuting of personnel between the two sites — possibly there are even more yet undiscovered ones — could be another reason for the comparatively high number of *officinatores* encountered at Giancola.

The interpretation of all names at Giancola which are not evidently names of free persons as slaves of Visellius is also questionable. The combination of Visellius' stamps with those showing other names is proven only in a very small number of cases, and in all these cases it must be left open whether the relationship was one between master and slave, or one between contractors.¹²² Moreover, at Marmorelle, the ratio of Visellius' stamps to those bearing other names is almost exactly 1:1,¹²³ thus suggesting that Visellius' name was stamped on one handle of each amphora, while the name of the other person was on the other handle. This was indeed the practice at the sites where Visellius was active, as finds of stamped amphorae with the stamp of Visellius and of another person show.¹²⁴ In Giancola, however, the ratio of Visellius' stamps to those with other names is c. 1:3, which can be seen as an indication that some persons attested there were active independently from Visellius, maybe as slaves or freedmen of other persons, who had leased a part of the yard. Among those whose stamps were not encountered together with the stamp of Visellius are nearly all of the above-average producers.

All these considerations lead to the conclusion that the Giancola installations are likely to have been part of a nucleated workshop industry, and not that of a manufactory. Visellius as owner or lessee of a part of the *figlinae* near Giancola, and of the entire *figlinae* near Marmorelle, leased or sub-leased parts of it, with the firing installations being used jointly. The combination of stamps with Visellius' name with those bearing other names should be interpreted as indicating the owner or lessee of the *figlinae*, namely Visellius, and the lessee of an *officina*, a system which we have already encountered in Spanish amphorae production. Again, *locatio conductio* contracts similar to those known from the Egyptian papyri would have been highly applicable to this situation. The use of stamps could easily be explained as being necessary for the separation of the products of each *atelier* after firing, as was suggested for Spanish amphorae production.

In research on Roman brick production the sub-division of *figlinae* into *officinae* has been well known for more than a century.¹²⁵ It is documented as early as for the first century B.C.¹²⁶ Steinby suggests binominal brick stamps be considered as referring back to a contract of work, a *locatio conductio operis faciendi*. Since brick stamps often offer more information than names alone, other elements of a *locatio conductio operis faciendi* are also to be found on them; namely references to the object of the contract, the *opus* (in this case *opus doliare* or *figlinum*), and to the place where the *opus* was to be undertaken, the *figlinae*. The two persons mentioned on the stamp are the contracting parties. The *dominus*, owner of the raw materials and of the final product, acted as a *locator*, while the contractor, who provided the means of production and ran them, acted as a *conductor*.¹²⁷ Taking up Steinby's suggestion, Aubert points out that other forms of the *locatio conductio* are also conceivable in brick and tile production, namely contracts of lease and of labour, *locatio conductio rei* and *operarum*.¹²⁸

Finally, the type of leases we know from third-century Oxyrhynchus are applicable to the *terra sigillata* production in La Graufesenque (first and second century A.D.).¹²⁹

¹²¹ Manacorda, op. cit. (n. 111), 8–9.

¹²² cf. Manacorda, op. cit. (n. 112, 1990), 381 n. 21.

¹²³ Manacorda, op. cit. (n. 111), 7.

¹²⁴ *CIL* III 6634, 17.

¹²⁵ H. Dressel, *CIL* xv (1891), p. 4, Helen, op. cit. (n. 96); Steinby, op. cit. (n. 33, 1982), 232–3; Steinby, op. cit. (n. 33, 1986), 100, 106–7, 149–50; Steinby, op. cit. (n. 33, 1993), 139–43; Aubert, op. cit. (n. 21), 222–38.

¹²⁶ Aubert, op. cit. (n. 21), 227 n. 81.

¹²⁷ Steinby, op. cit. (n. 33, 1982), 232–3; Steinby, op. cit. (n. 33, 1986), 100, 106–7, 149–50; Steinby, op. cit. (n. 33, 1993), 139–43.

¹²⁸ Aubert, op. cit. (n. 21), 232–5.

¹²⁹ Strobel, op. cit. (n. 53), 91–114, esp. 96–7, 100–14.

The Gaulish *terra sigillata* production is characterized through a scatter of small workshops which have been understood as a nucleated workshop industry.¹³⁰

To sum up, traces of the organization of pottery mass production as a nucleated workshop industry legally based on lease-contracts and partly sharing facilities such as kilns can be found as early as the first century B.C. in Italy, as well as slightly later in the provinces. This model can therefore be extrapolated to other fields of pottery mass production.

VI. FUNCTION OF PERSONS REFERRED TO ON ARRETINE *TERRA SIGILLATA* STAMPS

As we have seen above, stamps do not give direct indications as to the function which the persons referred to performed in the production process. We can therefore draw conclusions only on the basis of further analyses. The occurrence of stamp groups, in which different name forms have the *duo nomina* and/or the *cognomen* of a master or patron in common, has led to the construction of so-called 'firms'. A typical stamp group of such a 'firm' consists of a number of stamps with name forms of different dependent persons, namely slaves and/or freedmen, having at least the *cognomen* of the master or patron in common, plus stamps which bear only the name of the master or patron, from mere initials to *tria nomina*. Normally, the latter kind of stamp, which is mostly called 'firm's stamp', is much more frequent than the former one, which is mostly called 'potter's stamp'. To name a typical example, the stamp C.ANNI occurs more than thirty-three times in five variants,¹³¹ whereas the thirty-seven slave names, which include the same *duo nomina*, are less frequent. Examples of these stamps are ARCHILAVS/C.ANNI, APOLLO/C.ANNI, CERDO/C.ANNI, CISSVS/C.ANNI, and so on.¹³² Many (thirteen) of them are found only once, twice, or three times, in one or two variants. Eighteen out of thirty-seven occur more than five times,¹³³ the most frequent CERDO/C.ANNI and ONESIM(us)/C.ANNI twenty times in four variants.¹³⁴ The stamps with *duo nomina* alone and thirty-two of the slaves' stamps were found in Arezzo. From the five which did not appear there, we have only one specimen each, so that we can consider their non-appearance in Arezzo as merely accidental.

The usual interpretation, which has prevailed since it was established by Italian excavators in the last century, considers the master as the pottery's owner and operating authority, while the dependants work as potters in their master's workshop. At least with the larger 'firms', the stamps with the master's name alone are not regarded as being made by himself, but by his dependants, since the comparatively extremely high frequency of these stamps would make it improbable that they were produced by only one person. The 'firms' are considered to have been run as large establishments, a claim backed by archaeological finds such as production installations. Nevertheless, all parts of this interpretation can be critically queried.

¹³⁰ Peacock, op. cit. (n. 16), 122–8, Aubert, op. cit. (n. 21), 208–11.

¹³¹ See Appendix, Table 1. Some of the C.ANNI stamps in *CVArr* 82' are stamps on decorated vessels and moulds, and were therefore probably mere parts of slave names, of which elements were integrated into the decoration on different areas of the vessel.

¹³² For examples see Fig. 1 and Appendix, Table 1. All stamps are collected under *CVArr* 83. C.AN(n)I/CHRESI(mus?) (*CVArr* 83i), C.AN(ni)/EROS (*CVArr* 83r), C.ANNI/FELIX (*CVArr* 83s), and C.ANNI/OPILLI(o) (*CVArr* 83z) used the doubtful form 'master's *duo nomina* in the genitive + the slave's given name' (cf. above n. 68), if these stamps are not

to be read from the bottom to the top line; this is a fundamental problem, which is discussed in detail above in Section IV.B.

¹³³ *CVArr* 83b, c, d, e, f, h, k, l, m, r, t, u, w, x, y, aa + bb, hh, ii.

¹³⁴ *CVArr* 83h and y. We have to distinguish between the number of stamps and the number of variants. Variants are stamps which bear the same name, but are not identical in form. Since each variant points towards a certain number of vessels stamped with it, the number of different variants is more meaningful for a comparison of the output than the total number of stamps. Unfortunately, we do not know how many vessels could have been stamped with one stamp.

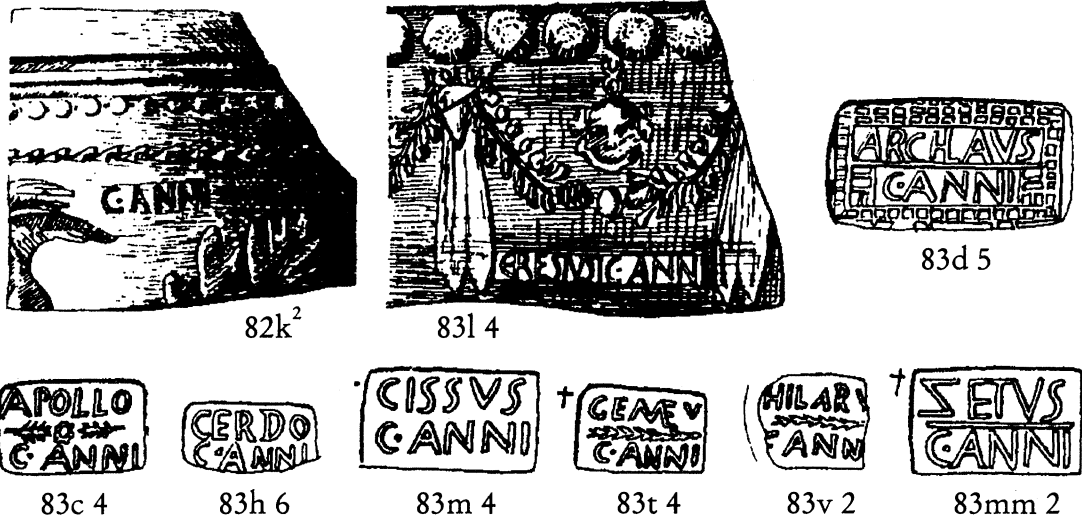


FIG. 1. SOME TYPICAL STAMPS OF THE STAMP GROUP C. ANNIVS.

A. Economically Independent Dependants

We can ask the question, if slaves and freedmen working in pottery production necessarily worked in their master's 'firm'. The assumption of 'firms' presupposes that personal dependence also causes economic dependence. However, this is not necessarily the case. A master always had the option to give economic independence to his dependants. One way was to transfer a *peculium* to the dependant, which could consist of any kind of property, credit, land and movables, or *vicarii*.¹³⁵ It also included the holder's personal savings, and all profits not claimed by the master.¹³⁶ In addition, the principal could entrust the *peculium* together with the right to administer it freely, with the *concessio liberae administrationis*.¹³⁷ By this permission, the dependant was given the capacity to make valid legal transactions.

Consequently, even the slaves in question could have run potteries independently from their masters. The pottery, or, as we shall see below, a part of it, could have been either the *peculium* itself or be bought or leased with a *peculium* in the form of a credit.

Another possibility was to employ dependants of any social status as *institores*, for, as we know from Ulpian, males and females, free persons or slaves could act as *institores*, the last for their own master as well as for third persons.¹³⁸ According to him, an *institor* was so called because he carried on a trade ('quod negotio gerendo instet'), not a big one, but of any kind.¹³⁹ Quoting late Republican or Augustan *iurisconsulti* (Servius Sulpicius and Labeo), he presents a list of occupations in which *institores* usually engaged, e.g. superintendents of various types of buildings, food dealers, bankers, traders, tailors, bakers, shopkeepers of all kinds, etc.¹⁴⁰ This list shows clearly that *institores* could be involved in any kind of business, in which they were enforced to enter into various kinds of contracts with their customers. Consequently, even a slave as an *institor* was entitled to do all kinds of business and transactions, which his master engaged him to do either for himself or for a third person. Therefore, nothing is against the assumption that slaves and/or freedmen as *institores* ran potteries, either workshops owned by their master, or ones leased, or even for a third contracting party.

¹³⁵ Ulpianus (29 ad ed.), Dig. 15.1.7.4.

¹³⁶ Florentinus (11 inst.), Dig. 15.1.39.

¹³⁷ Ulpianus (29 ad ed.), Dig. 15.1.7.1. The *libera administratio* was first mentioned by Proculus (7 epist.), Dig. 46.3.84, and gave the right of free disposal of the *peculium* to the holder.

¹³⁸ (28 ad ed.), Dig. 14.3.7.1.

¹³⁹ (28 ad ed.), Dig. 14.3.3.

¹⁴⁰ (28 ad ed.), Dig. 14.3.5.1-15. Cf. for details Aubert, op. cit. (n. 21), 6-9.

Taking the evidence from other cases of pottery mass production into consideration, it is conceivable that owners of property outside the ancient city boundaries of Arezzo rented out facilities for pottery production. This could have been land, clay pits, or entire potteries. The kind of contract would have been a *locatio conductio rei*, its object being production facilities. The vessels would have been the property of the potter, who as *conductor* had to pay rent to the owner of the facilities, the *locator*, who would have had no say in the running of the pottery. Each known dependant could have leased a pottery or a part of it on his own behalf, be it as an *institor* or as a slave *cum peculio et concessione liberae administrationis*. Since, as we have seen, financial funds were not necessarily a condition for entering into a lease, the *peculium* could, for example, have consisted of *vicarii*.

However, other possibilities should also be looked at. Strobel suggested for the Gaulish *terra sigillata* production in La Graufesenque that both the supply of raw materials and the selling were in the hands of the land and pottery owners. He presumed that expenditure for raw materials, tools, specialists, etc., would have overtaxed a contractor's means, including the organization of selling.¹⁴¹ According to his hypothesis, the landowners would also have fixed the number and forms of vessels to be produced. We do not know how the selling was organized in Arezzo, but a similar scenario cannot be excluded.

The distribution of production sites in and especially outside Arezzo also points towards the use of leasehold systems. The map printed in the *CIL* shows twelve places where the main finds were made.¹⁴² All are situated outside the ancient town boundaries, obviously on *praedia suburbana*. These places were thought to have been the locations of the ancient potteries. At many places members of more than one group were active, sometimes of three or even four.¹⁴³ It is not very likely that each of the workshop managers working there himself owned all means of production including the raw materials. We must, therefore, assume that interdependence between landowners and pottery producers led to the use of *locatio conductio* contracts of whatever kind. The fact that finds belonging to different groups were encountered together argues for the supposition that members of these groups co-operated with the same landowner. The landowner was also the one who could make the investments for setting up large production installations, such as the clay-processing installations, and the big kilns described below.

The assumption that each signing dependant did produce independently would explain why each 'firm' used simultaneously with the 'potters' stamps' the so-called 'firms' stamps'. Various attempts have been made, but none have answered this question satisfactorily. Prachner, for example, suggested that in very small 'firms' the master worked as a potter himself, whereas in larger ones either the same slaves and freedmen used for some vessels their own stamps and for other vessels the 'firm's stamp', or perhaps not all potters were allowed to use their own stamps. These obvious differences

¹⁴¹ Strobel, *op. cit.* (n. 53), 110–11. To reinforce the parallel between amphorae production in Oxyrhynchus and *terra sigillata* manufacture in La Graufesenque, he argues against Cockle, *op. cit.* (n. 80), 96, that the large number of amphorae made in the Oxyrhynchite potteries would indicate that not all vessels were used by the owner of the pottery himself, but were also sold to smaller neighbouring estates, who could not afford to run their own potteries (*ibid.*, 93 and 95).

¹⁴² *CIL* XI 2.1, p. 1082. Cf. the map shown as Fig. 2. (The map is a redrawn and improved version of the map depicted in *CIL* XI 2.1, p. 1082. The locations are numbered as in the *CIL*, the assignment of the workshops to the locations shown on the map is that

of Ihm, *CIL* XI 2.1, p. 1082. I have added the location of the workshop of Cn. Ateius, which makes up the only new findspot. The extension of the ancient town at the end of the first century B.C. is shown according to G. Maetzke, s.v. Arezzo, *Enciclopedia dell'Arte Antica Classica e Orientale* I (1958), 617–18, fig. 798. For the redrawing the *Atlante dei siti archeologici della Toscana*, Biblioteca di studi e materiali 1 (1992), Tav. 114 and the *Guida d'Italia del Touring Club Italiano* 11⁴ (Toscana) (1974), city map of Arezzo p. 837, were used as correctives.)

¹⁴³ cf. Fig. 2. At eight locations, more than one group was present (nos 1, 2, 4, 6, 7, 9, 11, 12), at six of these three or four groups (nos 1, 4, 6, 7, 9, 11).

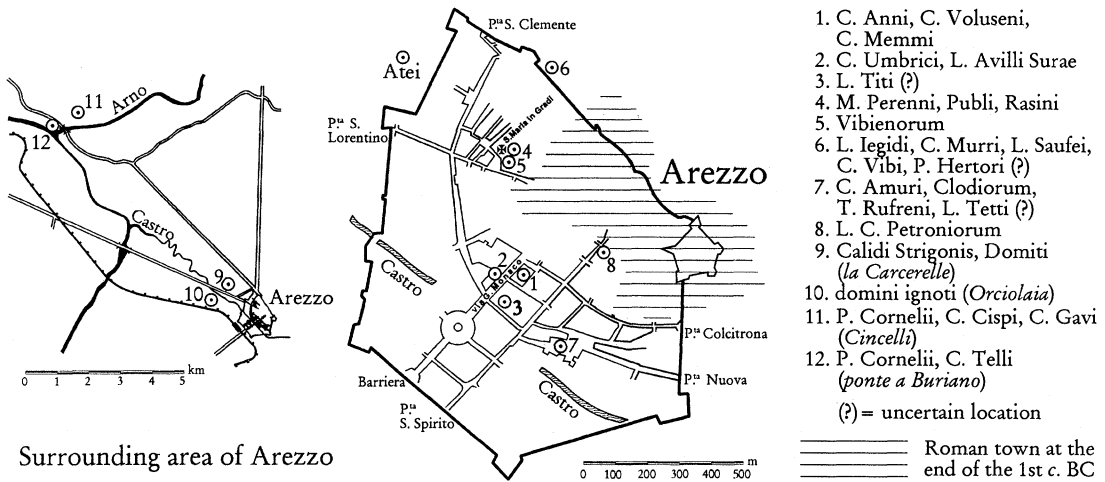


FIG. 2. MAP OF AREZZO AND SURROUNDING AREA WITH MAIN FINDSPOTS
(FOR DETAILS SEE N. 142)

1. C. Anni, C. Voluseni, C. Memmi
 2. C. Umbrici, L. Avilli Surae
 3. L. Titi (?)
 4. M. Perenni, Publi, Rasini
 5. Vibienorum
 6. L. Iegidi, C. Murri, L. Saufei, C. Vibi, P. Hertori (?)
 7. C. Amuri, Clodiorum, T. Rufreni, L. Tetti (?)
 8. L. C. Petroniorum
 9. Calidi Strigonis, Domiti (la Carcerelle)
 10. domini ignoti (Orciolaia)
 11. P. Cornelli, C. Cispi, C. Gavi (Cincelli)
 12. P. Cornelli, C. Telli (ponte a Buriano)
- (?) = uncertain location

==== Roman town at the end of the 1st c. BC

in stamping by potters, who threw the same product, are not easy to explain, if one maintains the assumption that all worked in one and the same workshop and 'firm'.¹⁴⁴

A likely conclusion, therefore, would be that there were no 'firms' consisting of master and dependants known from the stamps: each stamp stands for an autonomous working production. The difference between a master's stamp, a term which describes the kind of stamp referred to without a strong interpretative bias like 'firm's stamp', and a dependant's stamp lies only in the frequency of occurrence, not in the function: both name the person responsible for the production of the vessel in whatsoever way. The higher frequency of masters' stamps is perhaps due to the master running a larger production unit himself, either his own or a leased one. It is possible that he employed more potters than his independently working slaves and/or freedmen, who produced either alone or with very few *vicarii*, so that their output was lower. On the other hand, the difference could also be the result of longer overall activity by the master as *offinator* in comparison to each of his dependants. Those potters who worked in the master's unit used stamps with his name alone, and remain, therefore, unknown to us.

The autonomously working production unit is very likely to correspond to the unit 'officina', which we know from other fields of pottery mass production. The existence of large production sites in the surroundings of Arezzo suggests that these autonomously working units were mere sub-units forming larger units, the pottery yards or *figlinae*.

B. Position of Persons Referred to by Masters' Stamps

The assumption that the persons referred to by masters' stamps ran a pottery or a part of it on their own behalf is backed by the occurrence of the mostly abbreviated addition *figulus* (or *-i*) on such stamps. In four cases out of the twenty-nine larger 'firms' analysed by Prachner, the addition *figulus* is used.¹⁴⁵

¹⁴⁴ cf. *SFAS*, 66 and 198. Prachner emphasizes rightly that it is very difficult to explain why vessels with 'Firmenstempeln' are in the majority. However, his cautiously formulated suggestion that potters had to stamp their own name on production above target only, and were allowed to offer this over-production on their own behalf when the production with 'Firmenstempeln' was already sold out, is debatable. On

the contrary, one can much more easily imagine that slaves' stamps could have been used to control whether or not a potter had already reached a production target.

¹⁴⁵ A.VIBI/FIGVLI (*CVArr* 2324); SENTI/FIGVL (*CVArr* 1731); SESTI/FIGVL/OPT (*CVArr* 1794); A.TITI/FIGVLI and A.TITI/FIGVL/ARRET (*CVArr* 2002).

At first glance, this addition could mean the *cognomen* Figulus or even a name of a slave. It is not very probable, however, that every seventh person in a group of twenty-nine, whose dependants were evidently involved in pottery production, bore by chance the *cognomen* Figulus. Quite the reverse, it would not be surprising if these people were involved in pottery production also on their own behalf, documenting this by the addition *figulus*. Possibly the term was in this context also used as a *cognomen*, or became one, which would not reduce the very high probability that direct involvement in pottery production caused the use of the addition in question.

Against the interpretation of the addition as the name of a slave called Figulus is the fact that in two of these stamps the term in question stands neither at the beginning nor at the end of the stamp, which one would expect for slave names, but in the penultimate position before another element.¹⁴⁶ This last element is in neither case a typical addition for a slave name such as an abbreviation for *servus*. In addition, three of these stamps occur in a frequency much higher than those of the evidently slaves' stamps of the 'firms' in question.¹⁴⁷ They share this characteristic with evident masters' stamps.

All these facts lead to the conclusion that persons referred to by stamps with a *figulus*-addition were involved as slave masters more or less actively in pottery production. We have no reason to assume that these stamps are in this regard exceptional. Therefore, masters' stamps should generally be regarded as hinting at persons involved in manufacture. Consequently, these stamps and stamps of dependants were not used by persons with a fundamentally different position in the structure of production.

The next question to settle is what position this was. Certainly, it was the one of a producer, and not the position of the land-owner to which the stamps refer. This fact does not exclude the possibility that a master, whose function as a producer caused his appearance on stamps, was also the owner of the land. However, the concentration of production of different groups on the same sites excludes that this was the rule.

C. Position of Persons Referred to by Stamps of Dependants

Discussing the function of the persons behind the stamps, Aubert claims with Pucci that figures based on so-called potters' stamps 'are meaningless, since we do not know whether the signatures represent potters, foremen, workshop managers, or factory owners'. To back this claim, he compares the situation in Arezzo with the Gaulish pottery industry, especially Lezoux, where the largest 'firm' is represented by only seven different signatures, which could stand for workers as well as for agents or independent craftsmen who had purchased the firm's moulds.¹⁴⁸ If the persons in question had been agents or foremen, they would have been involved with production by a certain number of potters. In many cases one of them would have dealt with the production of moulds and moulded vessels, as well as with plain pottery.¹⁴⁹ Moreover, an agent or foreman for less than three or four potters would not have made economic sense. The same applies to a factory owner. Several potters belonging to the persons in question would have worked for them, and would have stamped with their names.

This assumption does not fit with the quantity of finds of slaves' and freedmen's stamps in Arezzo, of which we have mostly only one or two specimens; many do not occur there at all.¹⁵⁰ In the latter case the conclusion that these slaves and freedmen also produced in Arezzo is made on the basis of their membership of a group, which was

¹⁴⁶ SESTI/FIGVL/OPT (CVArr 1794); A.TITI/FIGVL/ARRET (CVArr 2002).

¹⁴⁷ A.VIBI/FIGVLI (CVArr 2324); A.TITI/FIGVLI and A.TITI/FIGVL/ARRET (CVArr 2002).

¹⁴⁸ Aubert, op. cit. (n. 21), 295.

¹⁴⁹ See below Section VIII.

¹⁵⁰ A look at the stamp group tables in *SFAS* makes that fact perfectly clear. To give a typical example, in

table No. 1 (*SFAS*, 9–16) 61 dependants of four Arretine stamp groups are represented by 149 different variants of stamps. The average number is 2.44 variants per person. Of 39 of them we have only one or two different variants of stamps. In Arezzo 45 out of 61 names were found, which means that more than one quarter is represented only by stamps from outside the assumed production place. See also the Appendix here.

located there with the help of other finds. If the persons in question had been agents or foremen, we would expect a higher number of stamps and variants of them. That the output equals to a certain degree the frequency of finds is clearly to be seen in the case of masters' stamps, which are normally more frequent than the dependants' stamps in the same group. This shows that it is most unlikely that slaves or freedmen occurring on *terra sigillata* stamps from Arezzo were any more than potters, unless we have additional hints such as an unusually high frequency of stamps of a person in question. However, this does not touch on the fact that even a potter slave could act as a contracting party on his own behalf, e.g. in a lease.

Another objection made by Aubert cannot be accepted for Arezzo either. He believes that 'stamped signatures may refer to specialized part makers instead of workshop owners or managers'.¹⁵¹ This might be possible in other cases; in Arezzo, however, it is entirely out of the question as the same names appear frequently on different kinds of pottery, moulded as well as plain.¹⁵² Names occurring on products which require different production processes, scarcely represent specialized part makers.

As we have seen, stamps on *terra sigillata* from Arezzo contain names of persons responsible for the production of the vessels. These persons could be free, freed, or slaves. They could work as potters themselves, or function as workshop managers. A proper term for these persons would be *offinator*. This term occurs on brick stamps, and is on this basis defined by Aubert as follows: 'The term *offinator* indifferently applies to a small potter working alone or with a few assistants, as well as to the director of one or several factories employing scores of workers'.¹⁵³ In addition, on brick stamps slaves and freedmen of *offinatores* are encountered as *offinatores* themselves.¹⁵⁴ Both this fact and Aubert's definition fit in perfectly with what we know of the persons referred to by *terra sigillata* stamps from Arezzo.

D. Identity of Persons Referred to by Stamps on Arretine Vessels

The problem which I wish to deal with in this section is whether or not one and the same name occurring on different stamps, especially on stamps of different periods of production, referred to one and the same person. As we have seen, a patron and his freedman would have used the same *duo nomina*. It is not possible to say if two variants of the same stamp were possibly used by two different persons, either contemporarily or one after the other. Some slave names are extremely common, and we cannot exclude the possibility that a master owned two slaves of the same name, either at the same time or successively. But would they have used different stamps?

The only way to answer this question is via the function of the stamps. As we have seen above, the most likely explanation for the employment of stamps on *terra sigillata* is as an aid to the organization of production and/or distribution. Stamps are a means of distinguishing products one from another, and, therefore, one producer from another. What we have to ask is at what stage of production and/or distribution this distinction was of importance. The master's stamps of bigger groups were definitely not applied by the master himself, but by potters stamping on his behalf. It follows that it was not necessary to have these potters distinguished by stamps. Hence the purpose of the stamps was not to control the output of every single potter. It follows that the reason for stamping the vessels must have come from outside the workshops.

Here, as already mentioned above, different explanations are possible. In the light of the evidence of the organization of other kinds of pottery mass-production, however, it seems to be possible to make some more specific assumptions. If the potteries were leased, and each lessee was committed to deliver a set number of vessels, it would have

¹⁵¹ Aubert, op. cit. (n. 21), 295.

¹⁵² cf. below Section VIII.

¹⁵³ Aubert, op. cit. (n. 21), 220. Cf. also his argumentation against Helen (op. cit. (n. 96)) in the question

of whether or not *offinatores* could work as potters themselves (Aubert, op. cit. (n. 21), 224-5).

¹⁵⁴ Steinby, op. cit. (n. 33, 1993), 142.

been in the interest of the lessor to be able to control the output and quality of each *officinatore* separately. This could have been managed by the use of stamps, which in this case would have reflected the *locatio conductio* contract. In addition, stamps could also have been used for the control of other activities outside the workshop. As we have seen above, the firing could have been organized independently from the throwing of the vessels. In this case, a kiln was shared by different *officinatores*. It would have been run by specialists, who were either slaves owned by one or more *officinatores*, or were acting as an independent party. In any case, stamps could have been used as a means of controlling the fulfilment of agreements.

Considering this, it seems to be meaningful to assume that the stamps were applied at least to distinguish *officinatores* from each other in Arezzo itself. Thus they would have failed their function, if more than one person was referred to by one stamp and its variants at one time. Consequently, we have to consider contemporary stamps on vessels from Arezzo as referring to only one person each. By contrast, we cannot say whether or not identical stamps referred to different persons in succession. To identify finds from outside Arezzo as belonging to a certain producer there, it would be necessary to confirm the place of origin and exclude forgeries by scientific methods such as chemical or mineralogical analysis of the material.¹⁵⁵ This applies especially to vessels and fragments bearing versions of stamps which have not yet turned up in Arezzo.

VII. SIZE AND NUMBER OF PRODUCTION-UNITS PER GROUP

After having established what function the persons referred to by stamps performed, it is of great importance to settle the question of the size of groups to be reckoned with, and whether large groups made up large single production establishments, or were divided into small separate units. Just as the fact that a quite large number of potters belonged to one entrepreneur does not necessarily mean that they worked at the same time, and under their master or patron, neither does it necessarily mean that they worked in one establishment or in one pottery. In either case, the above discussed model of manufactory production would become questionable. In addition, the proof of multi-unit production would not only question the idea of manufactories, but also reinforce the hypothesis of dependants as independently working *officinatores* and leasehold systems in Arezzo. These are much more likely to effect spread structures than concentrated ones. By contrast, if the larger groups in question had been made up of large single production units, and a high grade of sub-division of labour was applied, one could legitimately call them manufactories, according to the definition suggested by Peacock.

A. Number of Contemporary Members per Group

A basic problem in this context is the question of how many dependants of a single master stamped at the same time with their own name, a problem which typically involves such terms as 'size and importance of firms'.¹⁵⁶ The highest estimated number of employees in bigger 'firms' is more than 100, while more recently a scholar claimed the number to be closer to 60-70.¹⁵⁷ We know of about 110 groups with known

¹⁵⁵ On these methods and on problems occurring in their application see below Section IX.

¹⁵⁶ Aubert, *op. cit.* (n. 21), 295.

¹⁵⁷ Gummerus, *op. cit.* (n. 2), 1488, reckons with more than 100 simultaneous potters in P. Cornelius' 'firm'. De Martino, *op. cit.* (n. 21), 339, mentions only the total number of potters of the biggest 'firms'

and the necessity of auxiliary staff. He seems to assume that the number cited as belonging to any single pottery owner represents the number he owned at a given time. Kloft, *op. cit.* (n. 21), 172-3, claims the production of *terra sigillata* in Arretium 'kannte bereits Betriebsgrößen, die sich der neuzeitlichen Manufaktur (60-70 Arbeiter) nähern'.

personnel and producers without known personnel who were active in Arezzo.¹⁵⁸ In fact, just four groups include more than thirty slaves or freedmen using their own names on stamps. One must ask whether all these persons belonged to the group in question for the whole time of its existence, or if the size of the actual group of persons was smaller than the group of stamps which has come down to us. To answer this question it seems to be useful to look at those groups where the proportion of the total number of members to the number of those simultaneously stamping is known. Unfortunately, this applies only to the group of C. Annius with thirty-seven dependants signing with their own names¹⁵⁹ over a period of *c.* twenty years.¹⁶⁰ Since one L. Annius, most likely a relative of Gaius, in all probability took over eleven of them at once, this can be regarded as the number of contemporaries.¹⁶¹ As a result, we can reckon that only one third to one fourth of the known thirty-seven dependants stamped at that time with their own name.

To the group of L. Titius belonged sixty known dependants in a period of *c.* thirty years, of whom thirty-nine appear only on rectangular stamps typical of the time from *c.* 10 B.C. to *c.* A.D. 10.¹⁶² About eighteen members occur in rectangular stamps as well as *in planta pedis*, and about fifteen *in planta pedis* only, which means that the former used name stamps in the period when the stamps' shape changed, and the latter after this change.¹⁶³ Of course, these are maximum numbers of all members over a certain period of production, and it is very likely that the numbers of contemporarily active members were considerably smaller. Therefore the numbers should not be used as a basis for far-reaching calculations. Nevertheless, they show clearly enough that again only a fraction of the whole number of stamping persons was active at one time.

The relatively small number of contemporaries — small in comparison to the total number — has an interesting implication. It means that the period in which a dependant stamped with his own name was often — if not normally — comparatively short. The suggestion that the stamps refer to *officinatores* could offer an explanation for this phenomenon: a potter did not stamp all the time he was active as such, but only when he acted as an *officinator*. This could have been for a short period of his life, or several of such, not necessarily in succession. The rest of the time he could have worked as a simple potter either in his own master's production unit, or for other *officinatores*. Unfortunately, where, how long, and for whom he did so remains obscure.

B. Evidence for Single-unit Production

For the existence of large single production units two arguments arise. First, the existence of two basins, one of which contained more than 40,000 litres; both are thought to have belonged to Perennius.¹⁶⁴ Aubert maintains, following Peacock, that 'the size of the levigation tanks of the potter Perennius, which could hold some 10,000 gallons, points towards very large units of production that imply some degree of division of labour and of specialization'.¹⁶⁵ However, various interpretations of these tanks are possible, and there is no cogent argument to necessitate such conclusions. The purpose of this equipment is disputed. The tanks could have been levigation tanks used to clean

¹⁵⁸ *SFAS*, 1.

¹⁵⁹ See Appendix, Table 1.

¹⁶⁰ For the period of production see *SFAS*, 19.

¹⁶¹ See *SFAS*, 21 and here Appendix, Table 2. Prachner knew of eight such persons, we can add three new finds (cf. Appendix, Tables 1 and 2).

¹⁶² See Appendix, Table 5; for the period of production see *SFAS*, 146.

¹⁶³ *SFAS*, 146, for up-to-date numbers see Appendix, Table 5.

¹⁶⁴ Published by U. Pasqui, 'Nuove scoperte di antiche figuline della fornace di M. Perennio', *NdS* 1896, 453–66. Used as an argument by e.g. H. Comfort, 'Terra sigillata', in T. Frank (ed.), *An Economic Survey of Ancient Rome* (1940), V, 188–94, 190; Kiechle, *op. cit.* (n. 15), 73; De Martino, *op. cit.* (n. 21), 339; Peacock, *op. cit.* (n. 16), 121; Aubert, *op. cit.* (n. 21), 296.

¹⁶⁵ Aubert, *op. cit.* (n. 21), 296.

the clay by mixing it with water, and allowing the coarser fraction to settle out. In this case the tanks would indeed be the largest known.¹⁶⁶ Another possibility is to look upon them as clay storage tanks, which would also back the model of large units. Peacock suggests considering the basins rather as mixing tanks because they are very close in size and shape to those used for instance on the isle of Djerba.¹⁶⁷ The modern potteries on Djerba, however, were not manufactories¹⁶⁸ but workshops employing no more than three potters and an overall personnel of twelve persons.¹⁶⁹ Finally, Hoffmann and Juranek consider the tanks in question as evaporation basins.¹⁷⁰ To produce very fine slip for red gloss after levigation, fine mud is conducted into large basins where the water evaporates slowly. This method is still used in traditional potteries, e.g. in France.¹⁷¹ In that case we can think of the smaller basin being used as a levigation tank, and the larger as an evaporation basin; both were connected, so that the levigated clay fraction could flow from the smaller into the larger basin.¹⁷² That this method was used to produce finely washed clay as raw material for the surface gloss has meanwhile been proved.¹⁷³ Due to the time needed for evaporation, the output would not have been very great.

In addition, we do not know whether the tanks were used by Perennius and his dependants alone. He could have shared them with others, or have supplied other workshops situated in another place. High-quality clay was also an object of trade.¹⁷⁴ It is indeed conceivable that the finely washed clay, raw material for the surface gloss, was exported to places where it was not available. To sum up, the existence of the two basins does not necessarily point towards very large units of production.

Second, as Prachner assumes, the find of a not easily datable Pompeian wall painting, showing four men sitting at round tables and working, could be regarded as evidence for the existence of manufactories in Arezzo.¹⁷⁵ Taking the presence of several potters' wheels in one room as proven, he concludes that small, middle, and large firms were distinguished by varying numbers of potters' wheels per production-unit.¹⁷⁶ However, various interpretations of the wall painting are possible. Maiuri interpreted the picture as a *taberna vasaria*, Rieth as an *officina vasaria*.¹⁷⁷ Moreover, another interpretation could be taken into consideration. Provided a pottery is shown, one could regard the four potters forming a vessel, whose shape gets more and more complete on each potter's wheel, as referring to different stages of the throwing process. This interpretation is also reinforced by the fact that the last potter's products are being taken away by a maid.

It is a moot point whether an undatable Pompeian wall picture, with an unclear content, can be used as evidence for Arretine production-structure. At best it can serve as a vague indication that we might possibly expect more than one but scarcely more than four potters' wheels in one workshop.

To sum up, there does not exist any strong or even cogent indication or evidence for large single-unit production in Arezzo.

¹⁶⁶ Peacock, *op. cit.* (n. 16), 54.

¹⁶⁷ *ibid.*

¹⁶⁸ *ibid.*, 38–40.

¹⁶⁹ *ibid.*, 9.

¹⁷⁰ B. Hoffmann and H. Juranek, 'Versuche zur Rekonstruktion von Terra sigillata', *Archäologie in Deutschland* (1993, no. 1), 32–5, esp. 32.

¹⁷¹ *ibid.*

¹⁷² cf. the sketch and the description by Pasqui, *op. cit.* (n. 164), 455–6.

¹⁷³ cf. A. Winter, *Die antike Glanztonkeramik. Praktische Versuche*, *Keramikforschungen* 3 (1978), 7–11; *Conspectus* 34, with more bibliographical references.

¹⁷⁴ Callender, *op. cit.* (n. 96), 41, mentions a find of a large number of amphorae 'full of very finely washed and levigated clay' (referring to H. Dressel, 'Di un grande deposito di anfore rinvenuto nel nuovo

quartiere del Castro Pretorio', *BCAR* 7 (1879), 143–96, esp. 193).

¹⁷⁵ *SFAS*, 191.

¹⁷⁶ *SFAS*, 245.

¹⁷⁷ A. Maiuri, 'Due singolari dipinti Pompeiani', *MDAI (R)* 60/61 (1953/54), 88–99, esp. 90–1, Taf. 31.2, explicitly excludes the possibility of regarding the picture as depicting an *officina vasaria*; by contrast, A. Rieth, 'Zur Frage der Römischen Töpferscheibe', *Fundberichte aus Schwaben*, n.s. 17 (1965), 153–5, esp. 155, interprets the picture as a pottery employing four stick-driven potters' wheels. However, the construction of the more than 40 cm high feet of the depicted round tables looks quite unstable, so that it is doubtful if they could bear a potter's wheel heavy enough to function as a stick-driven fly-wheel.

C. Evidence for Multiple-unit Production

It is, however, not very probable that e.g. C. Annius and his dependants ran eleven single potteries, or more. That is why we must assume some concentration and co-operation of producers. We can expect this also from the fact that potteries producing bricks or amphorae could be run by more than one *officinator*, and that such potteries could form production complexes containing several kilns.¹⁷⁸

Archaeological evidence also supports this supposition. First, finds made in Arezzo show clearly that stamps referring to members of the larger groups were not scattered all over the area in question, but concentrated in a few places. This applies not only to single groups. At some places more than one group was active, sometimes three or even four.¹⁷⁹ Second, a graffito on which the names of four dependants of C. Annius are noted in the genitive case, shows that we can expect a certain degree of co-operation.¹⁸⁰ Finally, Funghini describes a *terra sigillata* kiln belonging to installations in Cincelli near Arezzo, close to which sherds of P. Cornelius and his dependants were found, whose firing chamber measured 2.84 m square, which makes a surface area of 8.06 m².¹⁸¹ For comparison, a small kiln's round firing chamber reported by Gamurrini from Arezzo as Augustan measured 1.20 m in diameter, which makes a surface area of 1.13 m².¹⁸² This was certainly the size of kiln typical for a single potter. It is very difficult to say how many potters would have made the use of such a big kiln effective, because we do not know the height of these kilns to compare their capacity, and additional important facts such as the possible frequency of firing remain unknown. However, this size of kiln also points towards a certain degree of co-operation.

Of course co-operation documented by this evidence could have been very limited, e.g. merely to joint firing, or even the engaging of independently working firing specialists. On these grounds even wasters do not necessarily prove that persons referred to by stamps dumped in them worked together. It means no more than that their products were most likely fired together. The same applies basically for other signs of co-operation. Stenico, for example, argues that 'fabbriche minori' worked in joint potteries, since sometimes identical *poinçons*¹⁸³ were used for the making of their moulds.¹⁸⁴ Of course, this interpretation is quite acceptable, and would fit in nicely with the assumption of leasehold systems. However, the evidence in question could also have been the result of commissioning the moulds from external specialists. The appearance of partners' stamps, and slaves with more than one owner, cannot be used as an argument for co-operation. It simply means that sometimes two *officinatores* ran one production unit together, and that slave *officinatores* were sometimes owned by more than one master. But they say nothing on the question of if and how co-operation was applied between these production units.¹⁸⁵

The model of multiple-unit production gets backing from the finds of sherds with stamps in Arezzo. The map printed in the *CIL* shows twelve places where the main finds appeared; one or mostly several names of alleged 'firms' are assigned to each.¹⁸⁶ However, these places are not proved locations of the 'firms', as e.g. Prachner assumes.¹⁸⁷ In the introductory text, Ihm uses phrases such as 'artem exercuisse videntur' or 'sedem

¹⁷⁸ cf. Section v.

¹⁷⁹ cf. n. 143.

¹⁸⁰ *CIL* XI 6702; A. Oxé, 'Die Töpferrechnungen von der Graufesenque', *Bj* 130 (1925), 38–99, esp. 51. Some very fragmentary graffiti from Arezzo are preserved. The best example is this vessel stamped by Rufus C. Anni, in which the names Archilaus, Epapra, Onesimus, and Ampio are engraved. With the exception of Ampio all these persons are known as slaves of C. Annius by stamps. Unfortunately, all graffiti from Arezzo are so fragmentary that the kind of co-operation remains obscure.

¹⁸¹ V. Funghini, *Degli Antichi Vasi Fittili Aretini. Estratto del Catalogo generale dell' Esposizione di*

Ceramica ed arti affini, Roma 1889, 4^a Edizione con molto aggiunte (1893), 18.

¹⁸² G. F. Gamurrini, 'Nuove scoperte di antichità', *NdS* 1887, 438–9.

¹⁸³ This term means the stamping tool used to press the inverted motives or patterns into the mould.

¹⁸⁴ A. Stenico, 'Sulla produzione di vasi con rilievi di C. Cispius', *Athenaeum* n. s. 33 (1955), 173–216, at 205.

¹⁸⁵ cf. *SFAS*, 113. Prachner shows this by way of an example of the jointly owned slaves of Rasinius and Memmius.

¹⁸⁶ *CIL* XI 2.1, p. 1082. Cf. Fig. 2 and n. 143.

¹⁸⁷ *SFAS*, 191.

habuisse videtur'.¹⁸⁸ The reason for Ihm's cautious formulations has its roots in the fact that stamped sherds of most groups were not found just in one place, and this applies especially to large ones. Furthermore the question arises of what can be regarded as a reliable indication of a production site. Since clear hints such as pottery equipment, kilns, clay processing basins, moulds used for the production of decorated vessels, or waste pits are extremely rare or not reported, a relatively high density of sherds belonging to a group in a small area is usually regarded as an indication of a production site.¹⁸⁹ Thus it seems to be worth investigating if there are any other concentrations of sherd finds from the four largest groups discussed above. In addition, the proposal above that all persons referred to by stamps — masters as well as dependants — acted equally as independently working *officinatores* can also be tested against this kind of evidence. If more than one possible production site for each of the firms in question can be located, not all of them should show a considerable concentration of masters' stamps indicating his activity as an *offinator*. This would be against the assumption of economic independence of dependants. Although it may well be that in the end the lack of unambiguous sources will prevent a decisive conclusion, one should none the less try to find at least some helpful hints.

The group of P. Cornelius is the largest one; sixty-nine slaves and freedmen belonging to it used their own names on stamps over a period of *c.* twenty years.¹⁹⁰ For this group, two main provenances are noted on the map, the village of Cincelli and a place near the bridge known as Ponte a Buriano.¹⁹¹ Fragments of moulds were discovered at Cincelli, so one can be quite sure that this was a production site.¹⁹² A second site at Ponte a Buriano is more doubtful, since reliable evidence such as fragments of moulds is missing. Here we have to analyse the content of the stamps before deciding on the nature of the site.

If the Cincelli and Ponte a Buriano sherds carry the same persons' names, we can assume that the latter site was probably only a centre for storage or retail. On the other hand, differing names indicate that the centre near Ponte a Buriano was independent of Cincelli, thus proving, at least indirectly, the existence of a second production site. For Cincelli, we find twenty-four names of dependants, for Ponte a Buriano twenty.¹⁹³ Eighteen potters from Cincelli do not appear at the site near Ponte a Buriano,¹⁹⁴ fifteen from there are not found in Cincelli.¹⁹⁵ Only five potters' names occur in both places, but with different stamps.¹⁹⁶ To sum up, nearly all the potters are confined to one place or the other, and not one stamp is found in both places.¹⁹⁷ It follows that the finds near Ponte a Buriano prove indirectly the existence of a second production site. The fact that the stamps of ten dependants of P. Cornelius appear only in the city of Rome and that the master's stamp with the *nomen gentilicium* only is very rare in Arezzo, but not in Rome, was interpreted by Prachner as an indication that P. Cornelius possibly ran a branch near Rome.¹⁹⁸ It certainly means that none of these ten worked at one of the two known locations in Arezzo, and we can assume the existence of at least a third place of

¹⁸⁸ *CIL* XI 2.1, p. 1082.

¹⁸⁹ cf. M. Ihm, 'Die arretinischen Töpfereien', *Bj* 102 (1898), 106–26. Unfortunately neither the Italian excavators, nor the *Corpus Vasorum Arretinorum* by Oxé and Comfort (*CVArr*), nor A. Stenico, *Revisione critica delle pubblicazioni sulla ceramica arretina* (1960), give any usable information on the state of the sherds bearing stamps. Therefore, it is virtually impossible to say if they were in a good state, or production waste.

¹⁹⁰ See Appendix, Table 3. Cf. *SPAS*, Tab. 6; for the period of production *SPAS*, 67–8. We can add four new finds to Prachner's list of sixty-five names, namely FELIX/P. CORNELI, OLVM(pus)/P. COR(neli), P. CORN(eli)/PILADI, and P. CORNE/PRI-MIG(eni?); all in rectangular frames (information by courtesy of P. M. Kenrick).

¹⁹¹ cf. Fig. 2, locations 11 and 12.

¹⁹² *CIL* XI 6700. 204, 209, 220, 244.

¹⁹³ See Appendix, Table 3. Cf. *CIL* XI 6700. 205–59.

¹⁹⁴ See Appendix, Table 3. Cf. the table *CIL* XI 6700. 204; *CIL* XI 6700. 205, 208a, 209a+c, 213a-c, 215, 216a-c, 220a-d, 221a+b, 227, 234, 235a, 237, 238, 242, 244b-d, 245b, 247a-c, 249a+b, 56, 59b (these data are collected in the table *CIL* XI 6700. 204).

¹⁹⁵ See Appendix, Table 3. Cf. the table *CIL* XI 6700. 204; *CIL* XI 6700. 207a+b, 210a+b, 212, 214, 217, 218a+b, 219, 222, 223a+b, 226a, 229, 230, 232, 233, 239, 248a+b, 252–4. The conclusion already drawn there by Ihm was: 'Itaque dubium non est, quin his fere locis, prope Cincelli et pontem vicinum a *Buriano*, officinae P. Corneli fuerint' (my emphasis).

¹⁹⁶ See Appendix, Table 3. Cf. the table *CIL* XI 6700. 204; *CIL* XI 6700. 228, 231, 240, 243.

¹⁹⁷ Even if this were the case, it would not be against the existence of different sites, for P. Cornelius could have moved some of his dependants from site to site.

¹⁹⁸ *SPAS*, 66. The number had to be changed due to new finds. The up-to-date state is represented in the Appendix, Table 3.

production. The same applies to eleven other persons who are not represented in Arezzo, but elsewhere.¹⁹⁹ We have, therefore, to reckon with at least three different sites where members of the group belonging to P. Cornelius were active.

A large number of master's stamps containing the *duo nomina* were found in Cincelli,²⁰⁰ whereas at Ponte a Buriano only two of them appeared,²⁰¹ plus three stamps near the church of S. Maria in Gradi.²⁰² We must, therefore, consider Cincelli as the place where P. Cornelius himself ran his own production unit.

It is questionable whether the master's stamps with the *nomen gentilicium* Cornelius alone refer to P. Cornelius. All of them are *in planta pedis*, and only three were found in Arezzo, but in contexts which point towards consumption and not production. Two were met in a grave, and one on a complete vessel.²⁰³ Prachner suggests considering them as belonging to P. Cornelius, because the two other known producers with the same *nomen gentilicium*, L. and M. Cornelius, are neither encountered in Arezzo nor on *in planta pedis* stamps.²⁰⁴ In my opinion two explanations are feasible, of which I favour the second. First, that the Cornelius from the *in planta pedis* stamps is not identical with P. Cornelius, and did not produce in Arezzo, but elsewhere. Second, the persons referred to are identical. In that case we must assume that P. Cornelius moved to a place outside Arezzo soon after A.D. 9, shortly after the appearance of the first *in planta pedis* stamps. At that time, his dependants had already finished their independent production, for we do not have stamps *in planta pedis* from them. Possibly he wanted to be closer to the place where the greater part of his products in this period could be sold: the city of Rome.

To Rasinius belonged c. sixty-three known persons, who signed over a period of c. twenty-five–thirty years.²⁰⁵ For this group, we can find two main locations. One of them, near S. Maria in Gradi, is noted on the map,²⁰⁶ 'id quod indicant formarum fragmenta plura ibi detecta'.²⁰⁷ However, if we take a look at the finds published in the *CIL*, we can count at least twenty stamped sherds unearthed near the via Guido Monaco, quite a distance from S. Maria in Gradi.²⁰⁸ In fact, there were many more than twenty, as for some specimens *multa exempla* is noted. All thirteen dependants, whose names appear on these sherds, are not encountered on the location near S. Maria in Gradi.²⁰⁹ This argues for the existence of a further production place. Moreover, in the alleged production place of Rasinius not one stamp of the master was found.²¹⁰ Where he himself was active remains obscure, as the four sherds with his name alone which turned up in the via Guido Monaco are not enough proof.²¹¹ After all, more than twenty finds of this kind were scattered all over the town.²¹² Regarding manufacture outside Arezzo, we know that Rasinius produced in Lyon, where a few stamps with the *nomen gentilicium* alone were found at a production site.²¹³

For C. Annius, one site is marked on the map. It is a large area lying between the church of S. Francesco and the via Guido Monaco.²¹⁴ Moreover, further stamped sherds of members of this group were unearthed in Cincelli and near S. Maria in Gradi, both far from the principal location.²¹⁵ In addition, stamps referring to C. Annius alone were found at neither of the two latter locations. This evidence, however, is not sufficient to

¹⁹⁹ cf. Appendix, Table 3.

²⁰⁰ *CIL* XI 6700. 204i–z, aa–dd.

²⁰¹ Three finds are reported (*CIL* XI 6700. 204f–h), but the reading of 204f as a stamp of P. Cornelius is in my opinion very questionable. Cf. also the report of G. F. Gamurrini, 'Nuove frammenti di vasi aretini scoperti nel sito di un' antica fabrica presso ponte a Buriano', *NdS* 1893, 138–42, esp. 41.

²⁰² *CIL* XI 6700. 204a–c. Cf. Fig. 2, location 5.

²⁰³ *CIL* XI 6700. 259a, b.

²⁰⁴ *SFAS*, 64.

²⁰⁵ See Appendix, Table 4. For the period of production cf. *SFAS*, 112.

²⁰⁶ cf. Fig. 2, location 4.

²⁰⁷ *CIL* XI 2.1, p. 1082.

²⁰⁸ *CIL* XI 6700. 520–2. Cf. Fig. 2.

²⁰⁹ See Appendix, Table 4. Cf. *CIL* XI 6700. 521, 523–5, 527, 534, 537, 540, 541, 543, 547–9.

²¹⁰ The discovery of fragments of forms with the master's name (*CIL* XI 6700. 520b; cf. also A. Stenico, *La ceramica aretina I, Rasinius*, Collana di testi e documenti per lo studio dell'antichità 4 (1960), nos 1, 25, 101, 114, 126, 151, 188, 213) does not count, since such fragments of moulds or moulded ware normally show only a part of a full name form of a dependant (cf. Section IV.B and the commentary on such finds in *CVArr* 1486).

²¹¹ *CIL* XI 6700. 520i–m. Cf. Fig. 2 for the location.

²¹² cf. *CIL* XI 6700. 520.

²¹³ A. and J. Lasfargues and H. Vertet, 'Les estampilles sur sigillée lisse de l'atelier augustéen de la Muette à Lyon', *Figlina* 1 (1976), 39–87.

²¹⁴ cf. Fig. 2, location 1.

²¹⁵ *CIL* XI 6700. 31–61. Cf. Fig. 2, locations 11 and 5.

locate the actual site, nor do the scattered finds indicate that there was only one establishment.

Finally, for the group of L. Titius and his dependants at least two separate locations with a concentration of stamp finds can be located. However, as Ihm had already pointed out when he was preparing the finds from Arezzo for publication in the *CIL*, the finds are not sufficient to claim one particular site to be the production place.²¹⁶

Considering this evidence, we can assume that the members of these larger groups were most likely not active at a central place, but on various discrete production sites. This shows clearly that the assumption of large single-unit production units is not backed by the evidence available. In addition, the hypothesis that stamps equally refer to independently working *officinatores* has been strengthened.

VIII. DEGREE OF SUB-DIVISION OF WORK AND SPECIALIZATION IN THE PRODUCTS

Most scholars take it for granted that the degree of sub-division of work in the larger *terra sigillata* 'firms' was higher than in the smaller ones.²¹⁷ This view is usually substantiated with quite general arguments regarding the optimization of the operational organization aiming at maximized productivity. The question has to be asked if these assumptions are compatible with findings based on analysis of the stamps.

The claims of minute sub-division of work are sometimes made under the premise that the alleged large number of workers led automatically to a rise in the division of work.²¹⁸ Another argument — mostly combined with the previous one — is based on the complexity of the production process required for the manufacture of moulded red-gloss vessels. It concludes that the number of stages in this process equalled the number of different workers or teams required to carry it out.²¹⁹ All these assumptions rest on the premise that the products, especially moulded ware, were in such demand that a pottery's operator would have been interested in maximum productivity, and therefore in the optimization of the operational organization. This premise is often combined with the consideration that a presumably expensive slave potter, who had been trained in mould-making, was an investment that must have paid for itself. That alleged fact is also claimed to have caused an interest in optimizing the operational organization around this specialist.²²⁰

Various objections can be raised against assumptions of minute sub-division of work. First, as we have seen, the size of the pottery-workforce has usually been overestimated, and, moreover, it is questionable whether a large workforce necessarily equals minute sub-division of the work. Second, the vast part of the production was plain ware, which does not need complicated processing. The supposedly comparatively large production-units run by masters as *officinatores* produced only plain vessels. Therefore, the main part of the production did not necessarily require an organization different from other potteries, apart from the making of the red-gloss, which, however, did not necessarily require costly installations or time-consuming work.²²¹

²¹⁶ Ihm, op. cit. (n. 189), 118. One site is noted on the map as the principal place, but with a query. Apart from sherd finds in this area, mentioned on the map as situated *inter viam Guido Monaco et viam Tolleta* (cf. Fig. 2, location 3), stamped sherds were unearthed near a place called Fonte Pozzolo, a long way from the principal provenance, with only three of them being master's stamps (*CIL* XI 6700. 696a¹, f + h. Cf. Fig. 2, location 6). Moreover, some sherds were also found near S. Maria in Gradi and *ad fluvium Castro*, with only one of them a master's stamp (*CIL* XI 6700. 696a². Cf. Fig. 2, location 5 (S. Maria in Gradi)).

²¹⁷ Gummerus, op. cit. (n. 2), 1485; Rostovtzeff, op. cit. (n. 4), 36; A. Oxé, *Arretinische Reliefgefäße vom Rhein* (1933), 8; Kiechle, op. cit. (n. 15), 70; Peacock, op. cit. (n. 16), 122; *SFAS*, 194; Aubert, op. cit. (n. 21), 296.

²¹⁸ *SFAS*, 192; Peacock, op. cit. (n. 16), 122; Aubert, op. cit. (n. 21), 296.

²¹⁹ Kiechle, op. cit. (n. 15), 70; While Oxé, op. cit. (n. 217), 8, assumed that the manufacturing of moulded *terra sigillata* was done by at least three hands, namely of the *poisson* maker, of the mould producer, and of the moulded-vessel potter, Prachner, *SFAS*, 194 n. 30, tries to show that e.g. the vessels' bases could have been added by a fourth hand.

²²⁰ e.g. Aubert, op. cit. (n. 21), 204: 'It would have been economically senseless to waste the talent and expertise of a specialised mould designer by employing him in other unrelated activities'; cf. v. Klaveren, op. cit. (n. 15), 145.

²²¹ Winter, op. cit. (n. 173), 7-11.

From the outset, the idea of entire large manufactories organized around a few mould-making specialists is incorrect. Members of fourteen groups were producing moulded ware,²²² containing *c.* 386 known stamping persons, of whom only sixty-five are mentioned on moulded ware.²²³ Given that stamps referred to *offinatores*, we can regard the persons occurring on moulded ware as specialized potter *offinatores*, who worked either alone or with very few personnel. Many of these so-called specialists appear in fact on different items. Twenty-nine out of the sixty-five are not only to be found on moulded ware and/or on moulds, but also on plain ware.²²⁴ The manufacture of decorated vessels did not necessarily lead to any extensive sub-division of work, since the engagement even of 'specialists' in different parts of the production process, and in the manufacture of different products, was evidently usual. In addition, it follows that moulded-ware potters were often not fully occupied by producing decorated vessels and moulds.

The relatively subordinate position of the manufacture of moulded ware could have internal or external reasons. It is probable that this part of the production represented the most profitable one. The transport costs were the same as for plain ware, while the retail price must have been considerably higher. That makes moulded ware most suitable for long-distance export, so that we can assume that each producer must have been interested in raising the output of this kind of product. Obviously this was not easily possible. By contrast, the finds show that decorated *terra sigillata* was evidently sold only in limited amounts. A higher output was possibly not marketable. Perhaps the reason lies in the process of the production of moulded ware: since the vessels had to dry in the mould before they could be removed, a potter could not make more moulded vessels at once than moulds were available. Their limited number might have restricted the possible output. Under these circumstances it must have been more economical to entrust a moulded-ware potter with all steps of the production of decorated *terra sigillata*.

One could also review the possibility that punches and/or moulds were produced by external specialists.²²⁵ However, this is, if at all, more probable for the early period of production of decorated ware. A general phenomenon of the manufacture of moulded red-gloss ware is the decline in quality, especially of the quality of the decoration, which became more and more simple and coarse.²²⁶ Hoffmann established by practical experiments that it was easy to make *poinçons* by taking impressions from moulded-vessels.²²⁷ Moulds and vessels made on this basis show a noticeable deterioration of the relief-quality, which equals the decline observable on ancient vessels.²²⁸ Moreover, it is also a typical phenomenon that potteries copied the motifs introduced by other — especially early — producers,²²⁹ in all probability using the methods of copying described by Hoffmann. These phenomena do not fit with the assumption of external specialists for the making of moulds and/or punches, from whom one could expect a more consistent high-quality over a long term.

To sum up, the evidence available in any case argues against the wide-spread conjecture of a production structure mainly based on division of labour, aiming at optimum productivity of moulded-ware manufacture.

As we have seen, specialization in the products makes up one part of the definition of the term 'manufactory'. *Terra sigillata* included many different kinds of pottery of widely varying sizes, shapes, surface qualities, and production techniques. In addition, we have to assume that coarse ware was also produced in *terra sigillata*-potteries. The

²²² *SFAS*, 221.

²²³ *SFAS*, 223.

²²⁴ 83k, 83r, 155, 157-60, 164, 166/167, 168, 170, 172, 176/177, 180/181, 500, 532, 1280, 1498, 1521, 1534, 1088, 2061, 2082/2084, 2086 plus one new find cf. *SFAS*, 29, Tab. 2; (all data according to the tables in *SFAS*).

²²⁵ cf. Section VII.C.

²²⁶ B. Hoffmann, *Die Rolle handwerklicher Verfahren bei der Formgebung reliefverzierter Terra Sigillata*, D.Phil. thesis, Munich (1983), 6.

²²⁷ Hoffmann, op. cit. (n. 226), 28.

²²⁸ Hoffmann, op. cit. (n. 226), 66-7, 92 and *passim*.

²²⁹ H. Klumbach, 'Materialien zu P. Cornelius', *Jb. d. RGZM* 22 (1975) (= *Festschrift Hundt* II), 47-61, esp. 48; Stenico, op. cit. (n. 184), 173-216, esp. 205; Stenico, op. cit. (n. 210), 22; H. Dragendorff and C. Watzinger, *Arretinische Reliefkeramik. Mit Beschreibung der Sammlung in Tübingen* (1948), 162-3.

high temperature needed for firing *terra sigillata* could certainly not reach every corner of a kiln's firing chamber, so that in all probability coarse ware occupied the remaining empty spaces.²³⁰ Specialization in the products, therefore, cannot be regarded as unusually high. At least it is not a basis for classifying the potteries in question as manufactories. By contrast most smaller potteries, which were in no way manufactories, did not produce decorated ware, so that their 'specialization' was higher than in the alleged manufactories.

IX. BRANCH WORKSHOPS AND PROVENANCING METHODS

In connection with the *terra sigillata* production in Arezzo we find that persons known from stamped signatures were also involved in *terra sigillata* manufacture elsewhere. Usually this is dealt with under the heading 'branch workshops'. Such distant and separate production sites can be determined either by finds of stamped material in a context related to manufacture, such as kiln sites or dumps, or the discovery of marked tools or moulds; by comparison of the mineral or chemical composition of the finds in question with finds of known origin (reference groups); or by inference from differing distribution patterns of products made by members of one and the same group.

For instance, quite a number of potters who were thought to have been active in Arezzo only were shown to have been involved in *terra sigillata* manufacture near Lyons by finds of wasters containing stamped fragments.²³¹ A pottery of the Arretine producer Cn. Ateius was located in Pisa on the basis of finds such as three plates melted together when fired, and clay rings used to keep a distance between the vessels during firing.²³² Finds of preserved kiln sites or even reject dumps are, however, the exception. Therefore methods of provenancing which are to a certain degree independent from such finds have been developed.

The analysis of pottery composition is an especially useful tool, which can shed light on problems of production and distribution of clay artefacts. Three main methods have been applied in revealing the provenance of the raw material of pottery finds, which in antiquity is normally identical with the area of manufacture: mineralogical-petrological analysis, i.e. visual examination of the texture of the material under a microscope, revealing the sample's mineral composition; chemical analysis, either by X-ray fluorescence (XRF) or by neutron activation analysis (NAA), i.e. the measure of the share of up to fifty elements in the material.²³³ Chemical analysis is the most reliable method, with NAA giving more precise results than XRF.²³⁴ The application of these methods to stamped *terra sigillata* fragments of unknown or debatable origin is followed by the comparison of their mineral or chemical composition with that of reference groups representing known areas or places of manufacture.

The most prominent instance of the application of such methods is the case of the Arretine manufacturer Cn. Ateius.²³⁵ Products bearing master's and dependants' stamps

²³⁰ *SFAS*, 239.

²³¹ This applies to Attius (*CVArr* 205, 212), Rasinius (*CVArr* 1485, 1543), C. Sentius (*CVArr* 1729, 1730, 1732), Thyrsus (*CVArr* 2062, 2068), and Cerdo C. Anni (*CVArr* 83), who are represented at the site in question by masters' stamps and/or dependants' stamps. cf. Lasfargues and Vertet, op. cit. (n. 213), 65-9.

²³² G. Pucci, 'Terra Sigillata Italica' in *Enciclopedia dell'Arte Antica Classica e Orientale, Atlante delle Forme Ceramiche* II (1985), 365-406, esp. 368.

²³³ On scientific provenancing in general G. Schneider and B. Hoffmann, 'Chemische Zusammensetzung italischer Sigillata', *Conspectus*, 27-37.

²³⁴ On XRF and NAA respectively cf. G. Schneider,

'X-ray fluorescence analysis and the production and distribution of *terra sigillata* and *Firmalampen*', and J. T. Peña, 'Two studies of the provenience of Roman pottery through neutron activation analysis', both in Harris, op. cit. (n. 28), 129-37, 107-20 respectively.

²³⁵ Cn. Ateius is in some regards exceptional. His group includes more than twenty dependants (*SFAS*, 26-9), of whom only a handful is represented in Arezzo (two without doubt, two questionable, cf. *SFAS*, 30). In addition, the master's stamps prevail not only in Arezzo, but also in production elsewhere. Many of his dependants were clearly freedmen, who had their own slaves (*SFAS*, 32). The most up-to-date discussions of the Ateius-problem are found in *SFAS*, 30-6 and Aubert, op. cit. (n., 21), 280-7.

have been assigned to Pisa,²³⁶ Lyons,²³⁷ and La Graufesenque.²³⁸ Vessels from the Arretine workshop, for which a refuse dump was found,²³⁹ were distributed mainly in Italy. Products from Pisa were exported overseas, whereas the Gaulish vessels can be found mostly in the Rhine area.²⁴⁰ It has been suggested that Ateius established these workshops to conquer new markets.²⁴¹ The existence of additional workshops in Italy as well as in the provinces has been assumed on the basis of the unequal distribution of products of members of the Ateius group.²⁴²

Further recent results of scientific provenancing suggest that we have to expect a far more frequent occurrence of 'branch workshops'. The chemical composition of a plate stamped with the name of the Arretine producer L. Umbricius Scaurus found in Cesurli in the lower Tiber valley proves that it was not made in Arezzo. The characteristics of the material suggest the Val de Chiana as the most likely provenance.²⁴³ This suggestion gets further backing by the fact that in this area another Umbricius was active, namely C. Umbricius Cordus.²⁴⁴ His kilns were excavated near Torrita di Siena in the Val de Chiana.²⁴⁵ At this site the Arretine producers A. Manneius and Camurius are also represented by stamped fragments. They were proved by chemical provenancing to have been involved in *terra sigillata* production near Torrita di Siena as well as in Arezzo.²⁴⁶ Two other Arretine manufacturers, L. Gellius and L. Sempronius, who worked partly together as is shown by stamps like L.GELL/L.SEMP, were active not only in Arezzo but also at Lyons.²⁴⁷ Finally, five further Arretine producers were involved in *terra sigillata* manufacture on the plain of the river Po as early as the end of the third decade of the first century B.C.²⁴⁸ Continued research will surely lead to more and more detailed data on the question of the location of production sites, and on persons involved in the respective manufacture.

To sum up, the application of scientific provenancing has led to the discovery of *terra sigillata* producers from Arezzo at distant production sites, as well as revealing that producers were active in Arezzo who are not represented by finds from there at all. There is a clear tendency for the 'branch workshop' phenomenon to turn out to have been much more common than expected. This commonness is much easier to explain when the persons who appear on stamped signatures are thought to have been *officinatores*, and, therefore, to have been very mobile. It is hard to imagine that each person we encounter in the context of distant production established a new workshop.

As we know from the workshop of C. Umbricius Cordus in Torrita di Siena, *terra sigillata* production could be combined with the manufacture of bricks, tiles, coarse ware, and even amphorae,²⁴⁹ all products typical of an ordinary rural or even villa pottery.²⁵⁰ In addition, a villa was located near the kilns.²⁵¹

²³⁶ P. Taponeco Marchini, 'La fabbrica pisana di Ateio', *Antichità Pisane* 1 (1974), 3-9. The workshop was located outside the actual town, cf. *Atlante dei siti archeologici della Toscana*, Biblioteca di studi e materiali 1 (1992), Tav. 104.

²³⁷ M. Picon *et al.*, 'Recherches sur les céramiques d'Ateius trouvées en Gaul', *RCRF* 14/15 (1972/3), 128-35; F. Wiedemann *et al.*, 'A Lyons branch of the pottery-making firm of Ateius of Arezzo', *Archaeometry* 17 (1975), 45-59.

²³⁸ R. Marichal, 'Nouvelles fouilles et nouveaux graffites de la Graufesenque', *CRAI* (1981), 244-72, esp. 251. This assignation is questionable because so far it is based on the analysis of a single sherd. Schneider and Hoffmann, *op. cit.* (n. 233), 32, mention five fragments of local products with dubious Ateius-stamps.

²³⁹ G. Maetzke, 'Notizie sulla esplorazione dello scarico della fornace di CN. ATEIUS in Arezzo', *RCRF* 2 (1959), 25-7.

²⁴⁰ Aubert, *op. cit.* (n. 21), 282.

²⁴¹ Picon, *op. cit.* (n. 237).

²⁴² E. Ettliger, 'Vorbemerkungen zu einer Diskussion des Ateius-Problems', *RCRF* 4 (1962), 27-44. *SFAS*, 32-5.

²⁴³ Peña, *op. cit.* (n. 234), 114-15 with n. 27; Pucci, *op. cit.* (n. 54, 1990), 23 with n. 13; Pucci, *op. cit.* (n. 54, 1992), 148-54.

²⁴⁴ *CVArr* 468.

²⁴⁵ Pucci, *op. cit.* (n. 54, 1990); Pucci, *op. cit.* (n. 54, 1992).

²⁴⁶ Schneider, *op. cit.* (n. 234), 132; Pucci, *op. cit.* (n. 54, 1992), 149; A. Manneius had four or five dependants, cf. *CVArr* 946-53, as for Camurius it is debatable whether his name was Camurius or C. Amurius, cf. *CVArr* 397.

²⁴⁷ Schneider, *op. cit.* (n. 234), 130-2.

²⁴⁸ S. Sertorius Ocella (*CVArr* 1775-85), A. Titius (*CVArr* 1998-2003), P. Attius (*CVArr* 209), A. Sestius (*CVArr* 1792-1819), C. Sentius (*CVArr* 1792-1819), S. Zabehlicky-Scheffenecker, 'Frühe padanische Filialen einiger arretinischer Töpfereien', *RCRF* 29/30 (1991), 95-104.

²⁴⁹ Pucci, *op. cit.* (n. 54, 1990), 19.

²⁵⁰ On the production of clay artefacts in the context of the villa economy in general cf. Peacock, *op. cit.* (n. 16), 129-35.

²⁵¹ Pucci, *op. cit.* (n. 54, 1990), 19.

It seems reasonable, therefore, to understand at least a part of the manufacture of Italian *terra sigillata* in a rural context, possibly as part of pottery production supplying larger estates. Thus the basis for the production would have been an already existing rural pottery which produced a wide range of clay artefacts needed in rural every-day life, as well as for the maintenance of buildings. It has been suggested that a kiln intended for other kinds of pottery could easily have been adjusted to the firing of *terra sigillata*, which required protection of the vessels from flames and exhaust fumes.²⁵² Even the construction of a new special kiln would certainly not have been a problem.²⁵³ Moreover, we know that glazed pottery was produced with the help of bowls in which the glazed vessel was placed so that it would be properly protected.²⁵⁴

Landowners were likely to have been interested in the extension of the product range of their pottery by the introduction of a new kind of product very suitable for sale, especially when a geographically advantageous situation made transport easy, e.g. the nearby water transport facilities in the case of Torrita di Siena.²⁵⁵ The best way to take part in the *terra sigillata* business would have been to engage specialists who had already gained some experience elsewhere, e.g. in Arezzo, to establish and to undertake production while using the existing pottery facilities. This is likely to have been arranged on the landowner's initiative. Of course, at this point the economic interests of landowner and craftsman coincide, and the establishment of *terra sigillata* manufacture on the initiative of the landowner is only one possible scenario. The common opinion has been so far that the actual producers themselves established 'branch workshops' to make export easier. To qualify this opinion, it is necessary to point out that it is at least equally likely that a landowner took the initiative to establish the manufacture of *terra sigillata* on his estate, rather than a socially inferior craftsman, or even his freedmen or slaves.

A further problem makes the interpretation of the so-called branch workshops difficult. This is the possibility, which should receive more attention, that potters travelled from one centre to another. Since we do not know whether the activities of members of one certain group in 'branch workshops' took place at the same time or successively, it is possible that the production of this 'firm' at different sites was not the result of the establishment of branch workshops or transfer of workshops, but the result of migration of the *offinatores* belonging to the group in question, even of the master with dependants. It is well known that in the second century A.D. *sigillata* producers moved around in the east-Gaulish-trans-Rhenish zone, sometimes migrating from one established production place to another, sometimes to new production sites.²⁵⁶ The possibility of similar migration should also be taken into consideration for Italian *terra sigillata* production. This suggestion gets support from a very recent study by Kenrick, who analysed the as yet unpublished finds from the important workshop waste of Cn. Ateius in Arezzo and Pisa, and argues that Ateius finished his activity in Arezzo before he moved to Pisa.²⁵⁷

We should now revise the use of such terms as 'establishment of branch workshops', 'expansion of major firms' or 'major firms' with 'branch workshops',²⁵⁸ since behind these terms lies the idea of the organization of the production and trade which is the least probable one. The very term 'firm' conveys the idea of a business enterprise with some kind of central book-keeping, whose members are first and foremost connected by business links. In the case of the so-called firms consisting of presumed main and branch

²⁵² N. Cuomo Di Caprio, 'Proposta di classificazione delle fornaci per ceramica e laterizi nell'area italiana dall preistoria a tutta l'epoca romana', *Sibirium* 11 (1972), 371-464, esp. 397. As known from finds in Gaul, *terra sigillata* was fired in kilns in which the hot gases were conducted through clay tubes (*tubuli*) so that the vessels could not get into contact with exhaust fumes and fire. Cuomo Di Caprio suggests that comparable results could be reached by plugging the central holes in the floor, and placing the *terra sigillata* piles in the shelter of other vessels so that they were not touched by flames.

²⁵³ cf. Section v.

²⁵⁴ cf. on this method Peacock, op. cit. (n. 16), 65,

referring to evidence from Holt reported by W. F. Grimes, 'The works depot of the XXth Legion at Holt', *Y Cymmrodor* 41 (1930), 182, and from Tarsus by H. Goldman, *Excavations at Gözlü Kule, Tarsus* (1950), respectively.

²⁵⁵ Pucci, op. cit. (n. 54, 1990), 23.

²⁵⁶ A summary of this is given by Peacock, op. cit. (n. 16), 118-19.

²⁵⁷ P. M. Kenrick, 'Cn. Ateius — the inside story', a paper presented at the international congress of the *Rei Cretariae Romanae Fautores* at York in September 1996; it will be published in the proceedings of the congress (*RCRF*).

²⁵⁸ cf. e.g. recently Aubert, op. cit. (n. 21), 277-84.

workshops, we do not know if there were any economical and business links at all between dispersed workshops, let alone some kind of central book-keeping. Part of the existing pattern of production places could even be explained by migration of the *officinatores*.

It is reasonable to assume that business links were much closer between a freedman of an Arretine *offinator* who worked at a distant site, and the owner of the land, the clay, the fuel, and most probably of some of the pottery facilities, than those were between the freed *offinator* and his patron. Even if economic links, which were determined mainly by the social relationship between freedman and patron, had indeed existed, I would still be reluctant to call this a business partnership which could constitute a firm.

The appearance of stamps, moreover, with slaves' names or masters' names alone in connection with distant production also does not necessarily mean that the master himself was involved in any way. Freedmen bore the *praenomen* and *nomen gentile* of their former masters. As we have seen, the use of stamps can be explained best in the context of actual production, i.e. on a local level. If production sites were distant from each other, distinction of freedmen and their patrons by different stamps would no longer have been necessary. Freedmen therefore could have used their *nomen gentile* alone, if they so wished and confusion of local producers could be excluded, with the result that their stamps are not distinguishable from their former masters' ones. For the same reason, namely identity of *praenomen* and *nomen gentile* of master and freedmen, the slaves encountered in the context of distant production could have belonged to freedmen active far from their patrons' site, and not to the patron himself.

To sum up, for quite a number of reasons the actual structure of distant production is likely to elude us. Since the evidence from other fields of clay production strongly suggests that we have to reckon with *officinatores* who worked as foremen in workshops belonging to their respective landowners, the probability is slight that the workshops in which they were active meet the idea envisaged by a term such as 'branch workshop'.

As long as we have no clearer evidence for economic links between distant sites of production, we are confined to the construction of models which are more or less likely to match reality. Therefore our terminology should be an open one, describing the reality of finds with minimum interpretation. Where possible we can adopt ancient terms by way of comparison with other fields of pottery production about which we are better informed. The general application of modern terms and their underlying ideas without sufficient backing from the sources is much more likely to obscure our view than to open fruitful perspectives.

X. CONCLUSIONS

I have attempted to show that stamps on *terra sigillata* from Arezzo contain names of single persons responsible for the production of the vessels. These persons could be free, freedmen, or slaves. They could work as potters themselves, or function as workshop managers. The proper term for their function is *offinator*.

It follows that the use of the term 'firm' for stamp groups consisting of stamps which bear the name of a free slave-master or patron plus a number of stamps with names of his dependants should be abandoned. Dependants could have worked as *officinatores* separate from their master's or patron's own production activity. The distribution of finds around Arezzo itself shows clearly that this was most likely the case in Arretine *terra sigillata* production. Therefore, the traditional interpretation of dependants as potters working under their masters to whom the potteries belonged should not be maintained.

As in other areas of pottery mass-production, we must expect in the *terra sigillata* manufacture near Arezzo the use of complex lease contracts, i.e. *locatio conductio* contracts of different kinds. It is most probable that the *officinatores* did not own all requisite means of production, and all raw materials themselves, but were forced into co-operation with both the landowner and each other. It is clear that the landowner as owner of the raw materials, especially of the clay pits and the fuel, was in a strong position. He was also the one who could find the means for setting up the necessary

production installations, which could be then run by a few *officinatores*, as was usual in the manufacture of amphorae, and bricks and tiles. Part of the evidence could also be the result of commissioning external specialists to undertake tasks such as firing.

The locations of production sites outside the ancient town boundaries of Arezzo suggest that the Arretine *terra sigillata* industry was sub-urban. As the discovery of other production places in Etruria shows, *terra sigillata* manufacture could also take place in a truly rural context. It seems, therefore, to be more appropriate to consider the production of *terra sigillata* as sub-urban and rural rather than urban.

To sum up, the model of multiple-unit production is backed by more evidence than the single-unit model. The usual arguments for the idea of manufactory production, such as the large number of employees in larger 'firms'; the existence of large clay-processing installations; minute sub-division of work; or specialization in products are not cogent at all. They can either be proved questionable, or explained by other facts. Since the term 'manufactory' has acquired a certain meaning in pottery research, especially since Peacock's contribution, it should no longer be used in connection with *terra sigillata* production in Arezzo.

Large-scale production of clay artefacts nevertheless required an organization which to a certain extent was different from normal workshop production. However, the difference does not seem to have been as striking as one might have expected. The mode of production prevailing in the field of amphorae, and brick and tile manufacture, as well as in the Gaulish *terra sigillata* production, seems to have been nucleated workshop production. In the centre of the organizational structure stood a comparatively small unit of production, namely the workshop (*officina*). Quite a number of *officinae* could be grouped together in a larger organizational unit, namely the pottery yard (*figlinae*). There is a tendency to detach into separate specialized units parts of the production process, which normally belong to workshop production, e.g. firing. This could be organized either by the *officinatores* themselves, or by a central authority such as the landowner for whom the artefacts were produced.

The archaeological evidence suggests that the Arretine *terra sigillata* industry fits nicely into the picture drawn of the production of amphorae, bricks and tiles, and Gaulish *terra sigillata*. It should be seen, therefore, as another example of the commonness of nucleated workshop industry as the organizational frame of pottery mass production in Roman antiquity.

The commonness of this form of organization of work raises the question of its advantages. To begin with, however, one has to ask if there was at all a rational choice to be made between the establishment of a nucleated workshop industry, and a manufactory. The formation of a nucleated workshop industry seems to be a more spontaneous, evolutionary process of economic development, as against the establishment of a highly organized manufactory, which needs the deliberate decision of an investor to come to life. When demand for a specific product rose, the answer could simply be the establishment of another production unit, be it at the instigation of a landowner who needed more containers for the transportation of his growing agricultural produce, or as an attempt by an artisan to take advantage of the surge in demand for a certain kind of tableware. Of course, the economic interests of landowner and craftsman could coincide. In addition, from the landowner's point of view, it would have been advantageous that current contracts were not affected when a new production unit was installed independently of existing ones, as running activities would not have been interrupted. This was also the case when production was to be scaled down for some reason, e.g. crop failure. In addition, it must have been easier to control the workers, especially slave workers, when they worked in smaller groups. Finally, it is conceivable that the responsibility which could be given to slave *officinatores* — perhaps combined with giving them a share in the profits — was a most effective way of increasing their interest in the quality and quantity of their products.

By re-examining the available evidence, I have tried to raise alternative possibilities for the interpretation of the epigraphical and archaeological material concerned with Arretine *terra sigillata* production. The aim of these efforts was to give an explanation of the phenomena encountered in the context of finds related to this industry which does

justice to the complexity of these phenomena, with the aid of supplementary assumptions mainly derived from other fields of ancient pottery mass production. One has to be aware, however, that this explanation is only a hypothesis, based on evidence too scarce and unreliable to make final answers possible. For this reason other explanations cannot be excluded, and even the currently best explanation might turn out to be wrong when new evidence turns up.

However, this applies to many results of research on antiquity, and should not stop us considering the more general implications of the proposed model. Questions could be: What can this model add to our understanding of the way the Romans responded to economic opportunities? What was the influence of the use of slave labour in this sector of production? How was slave labour used? Was a certain kind of 'slave mode of production' developed? What about qualitative innovations in the organization of production?

The kernel of nucleated workshop production was of course the workshops. A workshop is, however, a place of work where persons of different social status, i.e. *ingenui*, freedmen, and slaves, could be active. Of course, skilled and less skilled slave labour was employed in workshops along with or without free labour, but this is in any case a kind of domestic and traditional use of slave labour, which did not change the mode of production at all.²⁵⁹ A workshop was a workshop independently of the social status of the craftsmen working in it. Slaves were used instead of free workers, perhaps due to the lack of skilled free workers, perhaps also due to some advantages of slave work (which would be difficult to define without data on the price of skilled slaves and skilled free labour in this particular case). As we have seen, on Arretine *terra sigillata* stamps free persons, freedmen and slaves are all represented. Free persons are also represented on stamps which are not part of a stamp group, and have been interpreted as small master craftsmen ('kleine Handwerksmeister').²⁶⁰ They were perhaps independent free *officinatores*. Moreover, it remains unknown to us whether free work — perhaps unskilled and seasonal — played a role in the Arretine *terra sigillata* production on a level that is not documented by stamped signatures. In any case, if there was novelty concerning the mode of production, it merely concerned the scale of exploitation.

Nevertheless, the development of nucleated workshop production undoubtedly brought some advantages such as the use of production facilities in common. But can we call this development a qualitative innovation? I would suggest that it be considered as more of a more spontaneous, evolutionary process of economic development, which could come to life without the deliberate decision of an investor. Even if such a deliberate decision was behind the creation of a specific nucleated workshop production, the innovation again concerns more the scale and less the type of exploitation.

What we meet here is economical evolution by way of adaption to new economical opportunities through optimization of known structures with minimum qualitative innovation; not economic revolution by the employment of a qualitatively new mode of production. All this is not to say that the formation of an industry such as the Arretine *terra sigillata* production was not exceptional. Only the combination of the process of minimum innovative adaption of the production with massive use of slave labour in a context not exclusively typical for the employment of slaves led to the kind of production we meet in Arezzo. Although innovation was minimal, and the mode of production not specifically 'slave mode', it is clear that this special kind of production must have been more effective than simple workshop manufacture. Thus the model presented here of Arretine *terra sigillata* production suggests — at least for the sector of pottery mass production — a notable flexibility of the Roman economy, and shows at the same time the narrow limits of its innovative capacity.

²⁵⁹ For the concept of 'domestic' and 'traditional' use of slave labour as opposed to its qualitatively innovative use cf. D. W. Rathbone, 'The slave mode of production in Italy' (review article of A. Giardina and A. Schiavone (eds), *Società Romana e Produzione*

Schiavistica (1981)), *JRS* 73 (1983), 160–8, at 167, and Carandini, op. cit. (n. 20), 250–3.

²⁶⁰ *SPAS*, 182, referring to Gummerus, op. cit. (n. 2), 1497.

APPENDIX

TABLE I. STAMP GROUP C. ANNIUS WITH 37 DEPENDANTS

CVArr. no.	Stamp	Total no. of finds	Finds in Arezzo	Variants of stamps	Moulded vessels	Moulds
82'	C.ANNI	33{16}	5{3}	5	15{9}	{3}
83a	ACHORISTVS + (?)	2	1	2	2	
–	ALBAN(us)C.ANNI	4{3}	1	2{1}		
83b	ANTEROS/C.ANNI	6{2}	2	2		
83c	APOLLO/C.ANNI	12{6}	3	3–4(?)		
–	APTVS/C.AN(n)I	1	–	1		
83d	ARCHILAVS/C.ANNI	5 + x	2 + x	1		
83e	ASTRAGAL/C.ANNI	6{2}	4	3		
–	ATTICVS + (?) (= 86c 3)	1	1	1	1	
83f	AVCTVS/C.ANNI	13{5}	2	6{1}		
–	{AN(ni)/AVC(tus)}	{1}	–	{1}		
83g	BLAND(us)(?)/C.ANNI	1	–	1		
83h	CERDO/C.ANNI	20{8} + x	4{1} + x	4(?)		
83i	C.AN(n)I/CHRESI(mus)(?)	1	–	1		
83k	CHRESTVS/C.ANNI	7{2}	4	5(?)	1	{1 die}
83l	CHRESTVS + C.ANNI	10	3	5	10	
83m	CISSVS/C.ANNI	11{3} + x	6 + x	4(?)		
83o	DIOMEDE(s)/C.ANNI	2	2	2		
83p	DIONISI(us)/C.ANNI	5{2}	2	1(?)		
83q	EPAP(H)RA/C.ANNI	5{1}	3	4{1}		
83r	EROS/C.ANNI	7	5	5(?)	1(?)	
	C.AN(ni)/EROS	1	1	1		2
83s	C.ANNI/FELIX	1	–	1		
83t	GEMELLV(s)/C.ANNI	6{1}	2	5{1?}		
83u	GLVCO/C.ANNI	19{5}	3	9		
83v	HILARVS/C.ANNI	3	1	2(?)		
83w	INGENV(u)S/C.ANNI	7{5}	1	2(?)		
83x	INVENTVS/C.ANNI	6{2}	2	4{1}		
83y	ONESIM(us)/C.ANNI	20{2} + x	14(?)	4(?)		
83z	C.ANNI/OPILLI(o)	1	1(?)	1		
83aa	PANTAG(at(h)us)/C.ANNI	1	1	1	1	
83bb	PANTAGATVS/C.ANNI	12{1}	3	5	10	1
	PANTAGATHVS + C.ANNI	6	1	2(?)	6	
83cc	PANTVS(?) /C.ANNI	1	1	1		
83dd	PHILE[-]/C.ANNI	3	3	2		
–	{PHILEROS/C.ANNI} (= 83dd?)	{3}	{3}	{1}		
83ee	PHILOMVSV(s)/C.ANNI	2	2	2		
83ff	PRIMV(s)/C.ANNI	4	2	2		
83gg	QUARTIO/C.ANNI	4{2}	1	3{1}		
83hh	RVFIO/C.ANNI	13{+ 8?}	8{+ 3?}	4(?)		
83ii	SALVIV(s)/C.ANNI	9{2}	7	3		
83kk	SECVNDV(s)/C.ANNI S(ervus)	1	–	1		
83ll	SVRVS/C.ANNI	2	2	2		
83mm	ZETVS/C.ANNI	5	1	3		
83n/nn	C.ANNI/ CORNE(lius).S(ociorum?)	1	–	1		

All data given in braces refer to new entries in the supplement to the *CVArr* prepared by P. M. Kenrick, which will be integrated into the second edition of the *CVArr* (under preparation). A question mark always denotes uncertainty due to an uncertain reading. Numbers given in the form X{Y} give as X the total number of finds including numbers from *CVArr*, *SFAS* and the supplement to the *CVArr*, and as {Y} the proportion of new entries from the latter supplement. Numbers given in the form {+X?} should probably be added to the numbers known so far from *CVArr* and *SFAS*. The addition '+ x' means that for some stamps no exact numbers are reported, only remarks such as 'several specimens'. Masters' stamps on moulded vessels and moulds are likely to have been combined with stamps bearing a dependant's given name, both together forming a dependant's name.

TABLE 2. STAMP GROUP L. ANNIUS WITH 19(?) DEPENDANTS

CVArr. no.	Stamp	Total no. of finds	Finds in Arezzo	Variants of stamps	Moulded vessels	Moulds	also in C. Anniius' Group
84	L.ANNI (internal stamp)	12{7} + x	5 + x	12{+ 1?}			
85	L.ANNI (external stamp)	7	7	1(?)	3	4	
-	{ACH(oristus?)/L.ANNI}	{1}	-	{1}			*{?}
86a	ALBANVS/L.ANNI	3(?)	2	3(?)			*
86b	ANTEROS/L.ANNI	1	1	1			*
-	{APOLLO/L.ANNI}	{2}	-	{1}			*
86c	ATTICVS/L.ANNI	3{1}	2{1}	3{1}	2		*
86d	AVCTVS/L.ANNI	4{2}	-	1			
86e	L.ANNI/CLEM(ens)	1	1	1			
86f	DIOGENES/L.AN(ni)	1	-	1			
86g	DIOM(edes)/L.ANNI	1	-	1			*
86h	EPIGON(us)/L.ANNI	2	-	2			
86i	EROS/L.ANNI	2	2	1			*
86k	FAVST(us?)/L. . . NI(?)	1	-	1			
86l	GERMAN(us)/L.(Anni?)	1	1	1			
-	{HIL[arus]/L.AN[ni]}	{1}	-	{1}			*
86m	IESIS(?)/L.ANNI	1	1	1			
86n	INGEN(uus)/L.ANNI	5	1	3			*
86o	MONTAN(us)/L.ANNI	3{1}	1	2	2		
86p	PHILERO(s)/L.ANNI	8{4}	4{+ 1?}	3	1	3	*
86q	QUARTIO/L.ANNI	6{2}	1	3(?)			*

TABLE 3. STAMP GROUP P. CORNELIUS WITH 69 DEPENDANTS

CVArr. no.	Stamp	Total no. of finds	Finds in Arezzo	Present at Cincelli	Present at Ponte a B.	Rome only	Variants of stamps	Moulded vessels	Moulds
471	CORNELI	98{39}	3	*			16	8{1}	
478	P.CORNELI (moulded vessels and moulds)	54 {+ x [†] } + x	38 {+ x [†] } + x	*	?		2	15(?)	39 + x
479	P.CORNELI (plain vessels)	154 {+ 58 [†] }	59 {+ 6 [†] }	*	*		48		
480	ADIVTOR/ P.CORNELI P.CORNEL(i?)/ ADIVT(or)	2 2{1}	1 -	*		*	1 2{1}		
481	ANTEROS/ P.CORNEL(i)	9{4}	3		*		7{+ 1?}		
482	ANTVS/ P.CORN(eli) P.CORNELI(us?)/ ANTHV(I)	11{3} 28? [†] {8?}	4 11	*			6{+ 2?} 9		
483	ANTIOCVS + P.CORNELI	15 + x	11 + x	*			2	11(?)	4(?)
484	APOLLO/ P.CORNE(li)	1	-			*	1		
485	AP(h)RO(disius)/ (P.C)OR(neli)	1	-			*	1		
486	ASTR[agalus?]/ P.COR[eli]	4	3		*		4		
487	ATTICE/ P.CORNE(li)	2	2				2		

[†]I refrain from giving exact numbers here, for it seems to me that there are a certain number of double entries from Arezzo which are not yet verified.

TABLE 3. STAMP GROUP P. CORNELIUS WITH 69 DEPENDANTS — *continued*

488	P.CORNE(li?)/ AVCTVS	9{3}	3		*		6{+1?}		
489	BITVHVS + (P.Corneli?)	8	8				1	8	
–	P.COR(neli?)/ BLAND(us)	2	2				1		
490	CERESI/ P.CORNE(li)	2{+1?}	1	*			2{+1?}		
490'	(P.)CORNE(li?)/ CRESTIO	3	2	*			3(?)		
491	CHRESV(s)/ P.COR(neli)	5	3	*			3		
–	(C)NAM(mus)(?)/ P.CORN(eli)	1	1	*			1		
492	P.CORNELI(us?)/ CLEME(ns)	3	2		*		2		
493	P.CORNE(li?)/ DIDALI	1	–				1		
494	DIOMED(es)/ P.CORN(eli)	5{1}	2				3		
495	P.CORNE(li?)/ DON.. (?)	1	–				1		
496	EPAGAT(hus)/ [P.C]OR(eli)	1	–			*	1		
497	EPAPHRA/ P.CORNE(li)	5{1}	–				2		
498	EPIGO(nus)/ P.CORNE(li)	8{1}	3		*		5		
499	EROS/ P.CORNE(li)	8{1}	1		*		4		
	EROS/(P.Corneli?)	1	1				1		1
500	P.CORN(eli?)/ FAVSTV(s)	5{+1?}	1				3{+1?}		
	{FAV?[stus?]/ PCOR(neli)}	{1}	–				{1}		
	FAVSTVS + (P.Corneli?)	7 + x	6 + x	*			3	4	3
–	{FELIX/ PCORNE(li)}	{1}	–				{1}		
	{PCOR[neli]/ FEL[ix]}	{1}	–				{1}		
501	FIDVS/ P.CORNEL(i)	2	2				2		
502	FIRM(us)/ P.CO(rnelius)	5{2}	–				2		
	P.CORNE(li?)/ FIRMVS	16{4}	5				7		
503	FORTV(?)/ P.COR(neli)	2(?)	–				2		
504	FRVCTV(s)/ P.COR(neli)	5{1}	4		*		2		
505	GEMELLV(s)/ P.CORNE(li)	9{4}	4		*		7{+1?}		
	P.CORN(eli?)/ GEMELL(us)	1	1				1		
506	GERM(anus)/ P.COR(neli)	5	3		*		3		
	P.COR(neli?)/ GER(manus)	1	1	*			1		
507	GLYCO/ CORNE(li)	2	–				2		

TABLE 3. STAMP GROUP P. CORNELIUS WITH 69 DEPENDANTS — *continued*

509	HE(l)EN(us?)/ P.CORN(eli)	6{4}	3		*		3		
510	CORN(eli?)/ HERM(eros)	2{1}	1(?)				2{+1?}		
511	HERACL(id?)A/ P.CORN(eli) P.CORNE(li?)/ HERACL(id?)A	7{5} 4{1}	2 2	*			4 2(?)		
–	HERACLIDA(?). S(ervus?)	4	4	*	*		2	1	1
513	HILARVS/ P.CORNE(li)	3{1}	2		*		3{1}		
514	HIMER(os)/ P.CORN(eli) P.CORN(eli?)/ HIME(ros)	2 2	1 1				1 1		
515	INGENV(us)/ P.CORN(eli)	7{2}	2	*	*		4{+1?}		
516	P.CORNE(li?)/ INVENT(us)	2	2		*		2		
546	P.CORN(eli?)/ KOUZA	2{1}	–				1		
517	LAETI or BEATI/ P.CORNELI P.COR(neli)/ L(a)ETI	1 1	1 –	*			1 1		
518	MEM(or)/ P.CORN(eli) P.CORNE(li?)/ MEM(or)	5{2} 2{1}	3 –	*			3{+1?} 1		
519	MENOLAVS/ P.CORNELI	2{1}	–			* (?)	1		
520	NEP/P.COR(neli)	14	14				1		
521	OCE(lla)/ P.CO(rneli) P.C[orneli?]/ OCE(lla?)	1 1	1 –	*			1 1		
–	{OLVMP(us)/ P.COR(neli)}	{1}				*	{1}		
522	PARIDES + P.CORN(eli)	1	1			*	1		1
523	PHART(enius?)/ P.COR(neli)	1	–				1		
524	a) PERI(genes)/ P.CORN(eli) b) PRI(n?)CE(ps?)/ P.COR(neli)	1 2(?) {+1}	1 1(?)	*	*		1 ?		
–	{PRIGE(?)/ P.COR(neli)}	{1}	–				{1}		
–	{P.CORNE(li?)/ PRIMIG(?)}	{1}	–				{1}		
525	PHILE(ros?)/ P.COR(neli)	4{2}	–				2		
526	PHILEROS/ P.CORN(eli)	2	2		*		2		
527	PHILONI(cus)/ P.CORNE(li)	12{1}	3	*	*		5		
–	{P.CORN(eli)/ PILADI}	{1}					{1}		
528	P.CORN(eli?)/ P(h)RAS(on?)	1	–			*	1		

TABLE 3. STAMP GROUP P. CORNELIUS WITH 69 DEPENDANTS — *continued*

529	PLOCAM(us)/ P.CORN(eli)	2	2				1		
	P.CORNELI(us?)/ PLOCAM(us)	13{1}	8				2		
530	POTVS and POTI/ P.COR(neli)	18{1}	8		*		7		
	P.CORN(eli?)/ POTVS and POTI	11{3}	5	*	*		5		
531	PRIMVS/ P.CORN(eli)	12{7}	–				3		
	P.COR(neli?)/ PRIMI	2{1}	–				1(?)		
532	PRIMVS + P.CORNELI	19 + x	12	*			4(?)	15(?)	2(?)
533	P.CORNELI/ PRISCVS	14{1}	9	*			5		
534	PVNI(cus?)/ P.COR(neli)	1	1				1		
535	QUARTIO/ P.COR(neli)	10{1}	4				4		
	P.CORN(eli?)/ QUARTI(o?)	4{1}	3				2{+1?}		
536	RODO + P.CORNE(li?)	13 + x	13 + x				2	9 + x	4
537	ROM(anus)/ P.COR(neli)	1	–	*		*	1		
–	P.CORN(eli?)/ SEDATVS	1	1				1		
538	P.CORN(eli)/ SEX(t)IO	1	–			*	1		
539	SPERATVS/ P.CORNE(li)	8{3}	2			*	5{+1?}		
540	STATI(us?)/ P.COR(neli)	4{2}	1	*			2		
	P.CORNE(li?)/ STATIV(s)	11{3}	5	*			1		
541	TERTI(us)/ P.COR(neli)	10{4}(?)	2				2{+1?}		
	[P.C]ORN(eli?)/ TERTI(us?)	2	2				2		
544	VRBANVS/ P.CORNEL(i)	3	–			*	1		
545	SETVS/ P.CORNELI	5	2			*	5		
	P.CORNE(li?)/ SETVS	1	1			*	1		

TABLE 4. STAMP GROUP RASINIUS WITH 63(?) DEPENDANTS

CVArr. no.	Stamp	Total no. of finds	Finds in Arezzo	Present at via G. Monaco	Variants of stamps	Moulded vessels	Moulds
1485	RASINIUS (<i>plain vessels</i>)	259	24(?)	*	92		
1486	RASINIUS (<i>moulded vessels and moulds</i>)	20	14		5(?)	8	12
1487	ACASTI/RASINI	13{5}	–		1		
1488	AESC(i)N(us)/RASINI	1	–		1		
–	{AMAN(dus)/L.RASIN(i)}	{1}	–		{1}		
1489	ANOP(tes)/RAS(ini)	2	–		2		
1490	ANTEROS/RASIN(i) (i)NISAR/ANTE(ros)	7{4} 1	1 1	*	3{1} 1		
1491	APELA + CELER (cf. 1496)	2	–		2		
1492	b) APELA + RASN a) APOLLO + (RAS..?)	1 1	– –		1 1		
–	{ARISTO/RASINI}	{1}	–		{1}		
–	{RASINI/ATTIS(?)}	{1}	–		{1}		
1493	AVC(tus)/RASI(ni)	1	1		1		
1494	BOSPOR(us)/RASINI	6{2}	1		2		
1495	CARPVS/RASINI	2	1	*	1		
1496	CELER/RASIN(i)	16{7}	3	*	5		
–	CERASI/RASIN(i)	6{5}	–		{3}		
1497	CER[do]/RAS[ini] (= 1498?)	5	–		1	1	
1498	CERDO/RASINI	6{1}	–		1	1	
1499	CERTVS/RASIN(i)	14{5}	2	*	7{+2?}	4{1}(?)	
1500	CERTVS + RASIN(i)	12	8		5(?)	7	5
1501	(Ch)RESIM(us)/RASIN(i)	4	–		1		
1502	CHREST(us) RASINI	3{2}	–		3{2}	2	
1504	CISSV(s)/RASINI	8{3}	–		2{1}		
1505	CLEME(n)S/RASINI	6{4}	1		3{1}		
1506	DIOGE(nes)/RASINI	2	–		1		
–	DIOGENES (RASINI?)	1	–		1	1	
1507	[Dio]ME(des)/[Ra]SIN(i)	1	–		1		
1508	DIOPHANT(es)/RASINI	1	–		1		
1509	DRACO(n)/RASIN(i)	2	–		2		
1510	EPAPHRA/RASINI	8{2}	3	*	5{+1}		
1511	EPHEBVS/RASINI	3	2		3		
1512	EROS/RASINI	2{1}	–		2{1}		
1513	EROS + RASINI	2	2		2	1	1
1514	EVTICVS/RASINI	11{5}	1		6{+1}		
1515	FELIX/RASINI	2{1}	–		1		
–	{RASINI/FELIX}	{2}	–		{2}		
1516	FRONTO/RASIN(i)	11{5}	2		3{+1}		
1517	FRVC(tus)/RASIN(i)	11{8}	–		3{+3?}		
1518	HERME(ros)/RASINI; HERM(eros) + RASIN(i)	4{2}	1		3{1}		
1519	RASINI/HILAR(us)/ AT(tianus?)	1	–		1		
–	[Hil]JARUS/[R]ASINI RASINI/HILARAT	1 1	– –		1 1		
1521	ISOTIMVS/RASINI	5{3}	–		3	1(?)	
1522	ISOTIMVS + RASINI (<i>moulded vessels and moulds</i>)	9{2}	7		4{1}(?)	4{2}	5
–	{IVRATV(s)/RASIN(i)}	{1}	–		{1}		
1523	LYSIM(achus)/RASIN(i)	1	1	*	1		

TABLE 4. STAMP GROUP RASINIUS WITH 63(?) DEPENDANTS — *continued*

1524	MAHES + RASINI MAHES/RASINI	4	4		2	2	2
1525	MERCA(tor)/RASINI	2{1}	1		2{1}		
1526	MOSCH(us?)/ RASINIA(nus?)	1	–		1		
1527	NICOM(achus)/RASIN(i)	1	–		1		
1528	ONESIMVS/RASINI	7{2}	1		3		
1529	OPILIO/RASINI	6{2}	2	*	3		
1530	PANTAGATHVS + RASINI	4	4		2		4
1531	PHARNA(ces)/RASIN(i)	2	–		1	2	
1532	PHARNACES + RASIN(i)	15	10		4	5	10
1533	PHILO/RAS(ini)	1	–		1		
1533 ¹	PHILOM(musus)/RASINI	1	1		1		
1534	PHILOTA/RASINI	3{1}	1	*	1	1(?)	
1535	PLANCI/RASINI	2{+2?}	1	*	2{+1?}		
1536	PRIM(us)/RASINI	1	–	*	1		
1537	PRIMIG(enius)/RASIN(i)	6{4}	–		1		
1538	PRIMVS/RASINI	3	1		3		
1539	PRINC(eps)/RASINI	4{1}	1		3		
1540 ^r	QUARTIO + RASINI	12{+1?}	11		5(?)	2	10
1542	ROMA(nus)/RASI(ni)	2{1}	–		2{1}		
1543	RVFI(o)/RASI(ni)	15{2} + x	–		1		
1544	RVFIO/RASINI	2	1	*	2		
1545	RVFIO/RASINAE	1	1		1	1	
1546	SALVIV(s)/RASINI	6{2}	3		2	1(?)	
1547	SECVND(us)/RASINI	2	1		2	1	1
1548	SERAN(us)/RASINI	1	–		1		
1549	SVAVIS/RASINI	7	1	*	6		
1550	SVRVS/RASI(ni)	3{2}	–		1		
1551	TET'TIANVS/RASINI	12{2}	4	*	6(?)		
1552	VRBANV(s)/RASIN(i)	2	–		2		
1553	ZOTIC(us)/RASINI	1	–		1		
1554	[?]ORCI(?)/[R]ASIN(i)	1	–		1		
1555	CY(r)VS(?)/RASIN(i)	1	–		1		
1007	CHRESTVS + RASINI + MEMMI	1	1		1		
1008	PANTAGATVS + RASINI + MEMMI	7(?)	3		?		
1009	QUARTIO + RASINI + MEMMI	1	–		1		
1009 ^r	... + RASINI + MEMMI	5(?)	–		?		

TABLE 5. STAMP GROUP L. TITIVS WITH C. 60 DEPENDANTS

CVArr. no.	Stamp	Total no. of finds	Finds in Arezzo	Variants of stamps	Moulded vessels	Frames
2052	L.TITV	133{54} + x	16 + x	38(?)		rect/ipp
2055	L.TITV/COPO and L.T.C.	88 + x	18 + x	33		rect
2058	TYRSI/L.TITV	4{1}	3	2		rect
2059	L.TITV L.L./THYRSI	5(?)	–	2		rect
2061	L.TITV/THYRSI	111	20	52(?)		rect
2062	L.THYRSI	112(?)	8	43(?)		rect
2063	TITV/THYR(si)	3	–	1		rect
2064	THYRSI	26	13	12		rect
2065	PRIMVS/L.TITV-T	1	–	1		rect
2066	A L.TI(ti)	2	2	2		rect/ipp?
2067	AG.L.T(itv) (cf. 2066)	2	–	2		rect/ipp?
2068	ANTERO/S.L.TITV	4{+ 4?}	–	3{+ 2?}		rect/ipp
2069	ANTEROS/TITV	8	1	4		rect/ipp
2070'	APELLES/TITV	2	–	2		rect
2071	APELL/IO.TITV	2	–	1		rect
2072	APRILIS/TITV {APRILI/S.TITV}	3{1} {1}	– –	2{1} {1}		rect/ipp
2073	AVCTVS/(L?)TITV	1	–	1		rect
2074	BLANDV(s)/L.TI.TI	7{1}	–	5		rect
2075	C.L.TITV(orvm?) or C(astus?).L.TITV (cf. 2077 frame)	3{1}	–	2{+ 2}		rect/ipp
2076	L.TITV(i).C(olossus?) or (astus?) (cf. 2091, esp. the frames/ 2077 + 2012c, esp. the frames)	7	4	5		rect/ipp
2077	L.TI(ti)CAS(tus?)	1	1	1		ipp
2012c	TITV/CAST(us?)	1	–	1		rect
2078	CE(?).L.TI(ti)	1	1	1		ipp
2079	CERDO/L.TITV CERDO/TITV	5 3	– –	2 1		rect
2081	CHRESIM(us)/TITV	4	–	3		rect
2082	CHRESTIO/L.TITV	8{4}	–	4{2}	1	rect
2083	L.TI(ti)/(CRE?)	1	1	1		ipp
2084	CHRESTIO/TITV	13	2	6	1	rect
2085	CRY(seros?).L.TI(ti)	1	–	1		rect
2086	CHRY/SANTI/L.TITV	5	4	5	1	rect
2087	CRYSE/ROS/L.T(itv?)	1	–	1		rect
2088	CINNAM(us)/L.TITV(i)	1	–	1		rect
2089	CINNAM(us)/TITV(i)	3	–	2		rect
2090	L.TI(ti)/CL(?)	2	1	1		ipp
2091	COLOS(sus)/L.TITV (cf. 2076, esp. the frames)	5{1}	–	2		rect/ipp
2092	DIOCLES/TITV	1	–	1		rect
–	{DIOMII/D(es).L.TITV(i)}	{1}	–	{1}		rect?
2093	DIONIS/TITV	1	–	1		rect
2094	DOME(sticus)/L.TITV {DOMESS/TICI.TITV} L.T[itv?]/DOM[estici?]	7{+ 2?} {2?} 1	1 – –	3{+ 2?} {1?} 1		rect/ round/ ipp
2095	EPAPHR(o)/DIT.TITV(i)	1	–	1		rect
2096	EROS/TITV	3	–	1		rect
2097	FA(ustio?).LTI(ti)	1	1	1		ipp
2098	FAVSTVS/TITV	1	1	1		rect
2099	FAVSTIO/L.TITV FAV[st]/IOL.[?]	4 1	1 –	3 1		rect/ipp
2100	FE(lix?) or (licio?).L.T(itv?)	1	–	1		rect

TABLE 5. STAMP GROUP L. TITIVS WITH C. 60 DEPENDANTS — *continued*

2101	FELIX/TITI	7{1}	3	5		rect
2102	FELICIO/L.TITI	1	—	1		rect
2103	L.TITI FL(orus?)	3	3	3		ipp
2104	GAL(?) /TI(ti)	2	2	2		ipp
2105	GEME/LI L.TITI GEMELL(us)/TITIVS	9{4} 1	1 —	5{2} 1		rect/ipp
2106	H.L.TI(ti) H.TIT(i)	3 1	2 —	3 1		ipp
2107	HILARIO/L.TITI	5	1	4		rect
2108	HY(?) .L.T(iti?)	1	—	1		ipp
2109	L.TITI/HYLE(?)	4	2	4		rect/ipp
2110	IANVARI/L.TITI.S(ervus), L.TITIIA(nuari?) and L. TI. IA	9{2}	4	6		rect/ipp
2111	ISO(timus?) /TITI	1	—	1		rect
2112	IVCV(ndus)/L.TITI	10	—	2		rect
2113	TITI/LICA(?)	3	—	3		rect
2114	LUCRI(o)/L.TITI	6{1}	4	3{1}		rect/ipp
2115	LVC/R(io).L.T(iti?).S(ervus?)	1	—	1		rect
2116	LYSIMA/C.L.TITI	3	2	2		rect
2117	MA(?) .L.T(iti?).	2	1	2		ipp
2118	MVCRO/TITI	1	—	1		rect
2119	MVRTILV(s)/L.TITI	1	—	1		rect
2120	L.T.N.	1	1	1		rect
2121	OPTATV(s)/L.TITI	3	2	3		rect
—	{OR.L.T.}	{1}	—	{1}		ipp
2122	L.T.O.	4	1	2		rect/ipp
—	{PHILADII/LTITI}	{2}	—	{2}		cross
2124	PHILO(?) /L.TITI	6(?)	—	4		rect/ipp
2125	PHILOS/ITVS/TITI	5	—	2		rect
2126	L.T.[F?]LO(rus?)	1	—	1		ipp
2127	PRIMI/L.TITI	2	1	2		rect
2128	PRIMIGE/NI.L.TITI	2	—	2		rect
2129	PRIMV(s)/TITIO(rum) PRIMV(s)/L.T[?] [P]RIM/[?]CTITI (Prim/ us.Titi?)	1 1 1	— — —	1 1 1		rect/ipp
2130	PRINCE/PS.TITI	10	—	3		rect
2131/32	PVDENS/L.TITI	3{1}	—	3{1}		rect/ipp
2133	QVARDA/TVS.TITI	2	—	1		rect
2134	ROMA/N(us).L.TITI	6{2}	4	3{1}		rect/ipp
—	{L.TITIR[?]}	{1}	—	{1}		ipp
2135	SECUND/V.S.L.TITI	2	—	2		rect
2136	L.TI.SEC	3	1	3		ipp
2137	SVAVIS/L.TITI	23{8}	5	10		rect/ipp
2138	L.TI(ti).SV(avis?)	1	—	1		ipp
2139	L.T.VE	1	—	1		ipp