

# ROMAN TERRACOTTA LAMPS: THE ORGANIZATION OF AN INDUSTRY

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## I. INTRODUCTION

It should be plain that important progress is to be made in the economic and social history of the Greco-Roman world through more systematic studies of the material remains.<sup>1</sup> In the field of ancient manufacture and commerce, M. I. Finley has called for 'a more sophisticated effort to approach quantification and pattern-construction',<sup>2</sup> and other historians too are well aware of what needs to be done.<sup>3</sup> Doing it, however, can be difficult, for such projects, if approached with a scholarly desire for precision, bristle with complications, and the results can often be no more than tentative. Such is the case with this study of the terracotta lamp industry. For their part, the archaeologists who have studied groups of terracotta lamps, whether from particular sites or particular museums, have not altogether succeeded in fitting the material into the known framework of Roman life (this is not to suggest a primacy of written over material sources, simply that both are indispensable in economic history).

So great is the number of surviving terracotta lamps in many areas of the Roman Empire that there is no prospect of their being fully catalogued for a long time to come. It is true that in recent years there have been some important contributions to the descriptive literature, with the appearance of catalogues, or at least lists, of lamps from a number of major sites and museums, as well as of those from some lesser but still interesting collections.<sup>4</sup> Probably the most important of all these publications, for the purposes of investigating the organization of the lamp industry, is the new Aquileia catalogue by Dr. Ezio Buchi under the title *Lucerne romane con marchio di fabbrica*, volume I of a projected larger work *Lucerne del Museo di Aquileia*. Though Northern Italy was the original home of the 'Firmalampen' (to be defined shortly), the category of lamps which perhaps arouses most historical interest, the only catalogue of a major North Italian collection before Buchi, was the rather inaccessible one of the lamps in the Verona museum published in

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<sup>2</sup> *The Ancient Economy* (1973), 33.

<sup>3</sup> See now some of the contributions in J. H. D'Arms and E. C. Kopff (edd.), *Roman Seaborne Commerce: Studies in Archaeology and History* (1980).

<sup>4</sup> The following are the most important ones published since 1960: J. Perlzweig, *Lamps of the Roman Period (The Athenian Agora VII)* (1961); P. Bruneau, *Exploration archéologique de Délos*, fasc. 26, *Les lampes* (1965) (supplemented in *BCH CII* (1978), 161-6); O. Broneer, *Isthmia III. The Lamps* (1977); M. Čičikova, "'Firmalampen" du limes danubien en Bulgarie', *Actes du IX<sup>e</sup> Congrès International d'études sur les frontières romaines* (Mamaia, 1972; publ. Bucharest, etc., 1974), 155-65; N. Gostar, 'Inscripțiile de pe lucernele din Dacia Romană', *Arheologia Moldovei* I (1960), 149-209; C. L. Băluță, 'Opaițele romane de la Apulum (I)', *Studii și Comunicări, Arheologie-Istorie-Etnografie* (Alba Iulia) IV (1961), 189-220, and II, *Apulum V* (1965), 277-95; D. Alicu-E. Nemeș, *Roman Lamps from Ulпия Traiana Sarmisegetusa (British Archaeological Reports, Supplementary Series 18* (1977)); A. Neumann, *Lampen und andere Beleuchtungsgeräte aus Vindobona (Der römische Limes in Oesterreich XXII)* (1967); C. Farka, *Die römischen Lampen vom Magdalensberg* (1977) (*Kärntner Museumschriften*, 61); H. Deringer, *Römische*

*Lampen aus Lauriacum* (1965); A. Leibundgut, *Die römischen Lampen in der Schweiz* (1977); M. Vegas, 'Die römischen Lampen von Neuss', in *Novaesium II* (= *Limesforschungen, Studien zur Organisation der römischen Reichsgrenze an Rhein und Donau* (1966), 63-127); E. Buchi, *Lucerne del Museo di Aquileia I* (1975); G. Sotgiu, *Iscrizioni latine della Sardegna II.1* (1968); M. Ponsich, *Les lampes romaines en terre cuite de la Maurétanie Tingitane* (1961); J. Deneauve, *Lampes de Carthage* (1969); E. Joly, *Lucerne di Sabratha* (1974).

Note also the following important publications of mainly unprovenanced lamps: J. Marsa, 'Roman Lamps in the Prague National Museum and in other Czechoslovak Collections, II', *Acta Musei Nationalis Pragae* XXVI (1972), 89-152 (this supplements R. Haken, *ibid.* XII (1958), 1-119); G. Heres, *Die römischen Bildlampen der Berliner Antiken-Sammlung* (1972); D. M. Bailey, *A Catalogue of the Lamps in the British Museum I. Greek, Hellenistic and Early Roman Pottery Lamps* (1975); II. *Roman Lamps made in Italy* (1980).

These works will be referred to by their authors' names alone. The following will be referred to as indicated: S. Loeschcke, *Lampen aus Vindonissa* (1919) (= Loeschcke, *LV*); D. Iványi, *Die Panonischen Lampen. Eine typologisch-chronologische Übersicht* (1935) (= Iványi); A. Balil, 'Marcas de ceramista en lucernas romanas halladas en España', *Archivo Español de Arqueología* XLI (1968), 158-78 (= Balil, 'Marcas'). For other collections see the bibliographical appendix.

1912-14.<sup>5</sup> It is symptomatic of the lack of Italian catalogues that we have no description of the holdings of the civic museum of Modena, though Mutina probably included in its territory at least one of the original centres of 'Firmalampen' manufacture, that of Fortis; 'Fortis' is the commonest of all 'Firmalampen' marks. Catalogues are also regrettably lacking in some other significant areas, particularly in the Gallic provinces.

Enough information is now available, however, to justify an overall discussion of the central problem which such lamps raise for the historian: the organization of the industry which produced and sold them. Not that this question has been altogether neglected in the past—in fact most of the scholars who have published large groups of lamps have hazarded some comments on the subject. Some of this commentary has been learned and acute. But more is needed: a full discussion should be based not only on the facts about the lamps themselves, but also on what we know about other segments of the Roman ceramics industry, and on what the legal, literary and epigraphical sources tell us about Roman commerce. In this article then I shall analyse the structure of the industry which produced signed lamps, including 'Firmalampen', as far as the available evidence permits.

The terms 'signed lamps', 'Firmalampen', and 'industry' all require some initial comment. The first of these will be used to refer to all lamps which were made with names on the bases, even though those names are not always the names of the actual manufacturers. Such 'signatures' appear on lamps of many different types. The category includes the large sub-category 'Firmalampen'. This expression, which appears to have been coined by O. Fischbach,<sup>6</sup> is conventionally used to refer to the lamps classified by S. Loeschcke (whose typology is the best known) with the numbers IX and X.<sup>7</sup> In the great majority of cases, while they have no decoration in the bowl or on the base, 'Firmalampen' give the maker's name, or what appears to be such, on the base; to take one place as an example, no more than 11 per cent of the 'Firmalampen' of Aquileia are 'anonymous'.<sup>8</sup> 'Firmalampen' have often been referred to in English as 'factory lamps', but this term conjures up some inappropriate images and should be avoided if possible. The Roman terracotta lamps that are not 'Firmalampen' are often categorized as 'Bildlampen', i.e. figured lamps. One disadvantage of this convention is that many 'Bildlampen', of types other than Loeschcke IX and X, also have makers' names and are just as likely to be the products of large firms.<sup>9</sup> Unfortunately no attempt to give a more logical sense to the term 'Firmalampen' has much chance of success. And as it happens, Loeschcke IX and X do have a distinctive geographical distribution which makes the word worth retaining.

The term 'industry' will also be used here with a reservation. A recent writer about the Roman ceramics trade complained with some justification that the word can be dangerously misleading when applied to a mode of production from which power-driven machines were absent.<sup>10</sup> But perhaps the risk that we shall forget that the economy of the Roman Empire was 'pre-industrial' in this sense is not now very great. Any production of artifacts in large numbers can without great discomfort be called 'industry', however the production was organized. There is no *a priori* supposition in this paper that any lamp-making enterprise had many workers in it.

The central problem is this. Whereas one might have expected that all simple terracotta lamps were made by small local enterprises which seldom exported them beyond the local town or village (and this was indeed part of the system), the enormous diffusion of certain lamp-types and, even more strikingly, of certain makers' names suggests strongly that something more complex was going on. Where then did production take place in

<sup>5</sup> C. Anti, 'Le lucerne romane di terracotta conservate nel Museo Civico di Verona', *Madonna Verona* VI (1912), 181-94; VII (1913), 6-24; VIII (1914), 99-116, 207-15. I have not seen the *tesi di laurea* on the tiles, amphorae and lamps of Verona written by Buchi (cf. Buchi, IX). For his 'Firmalampen e anfore "istriane" del Museo Romano di Brescia' see *Atti del Convegno Internazionale per il XIX centenario del Capitolium...* (1973; publ. 1976) II, 217-57. At Verona and elsewhere 'collectors' lamps' are a complicating factor in the museum holdings, since their provenances are usually unclear; this applies to the lamps catalogued by M. C.

Gualandi, *Lucerne fittili delle collezioni del Museo Civico Archeologico di Bologna* (1977).

<sup>6</sup> O. Fischbach, 'Römische Lampen aus Poetovio', *Mitteilungen des Historischen Vereins für Steiermark* XLIV (1896), 10-11.

<sup>7</sup> See Loeschcke, *LV* 255-73.

<sup>8</sup> cf. Buchi, Table I.

<sup>9</sup> On this confusion see Balil, 'Marcas', 159 n. 2; A. Provoost, 'Les lampes antiques en terre cuite', *L'Antiquité Classique* XLV (1976), 558 n. 34.

<sup>10</sup> G. Pucci, 'La produzione della ceramica aretina. Note sull' "industria" nella prima età imperiale romana', *DA* VII (1973), 260-5.

relation to the markets for the lamps, and how were the units of production related to one another? Were there in fact large enterprises at work in the lamp industry, and if so, how did they function?

From the following study it emerges that although most of the lamps with widely diffused makers' names were made in scattered locations and quite near the places where they were sold, there probably was a real connection between many if not all of the workshops that used particular names. While some unauthorized use of names must have occurred, a major part of the system consisted of branch workshops; this becomes more credible, and can be understood better, if we give due attention to what is known about *institores*, the managers of such subsidiary enterprises and an important element in the Roman economic system.

## II. THE LAMPS AND THEIR DISTRIBUTION

The basic forms of Roman terracotta lamps have often been described. The typologies of H. Dressel and H. B. Walters<sup>11</sup> are still sometimes cited, but simplicity and custom have established Loeschcke's system as standard. It at least has the advantage of being familiar to all interested scholars, and types classified by Loeschcke will be referred to in this article by his numbering. Unfortunately the Loeschcke system is not comprehensive, and other classifications have been devised, notably by Broneer, Iványi, Ponsich and Deneauve.<sup>12</sup> New systems continue to appear,<sup>13</sup> contributing somewhat to a confusion which only an authoritative empire-wide survey could dispel.

The lamps under discussion, though they vary greatly in detail, are almost all covered by the ensuing description: the lamp is a shallow covered container of terracotta, with an opening for the wick towards the front of the upper surface; in most cases, the main part of the lamp is circular or roughly circular, with a nozzle at the front, though in some types nozzle and body form a single unit roughly in the shape of a lyre. Dimensions are generally in the range 6–14 cm (length) × 5–9 cm (width) × 2–4 cm (height, without handle). The upper surface or bowl of the lamp sometimes contains a decorative element (much commoner with some types than with others); and the base of the 'signed' lamps to be discussed here carries a Latin name, usually in relief. Other features, such as handles, are common but far from uniform. It remains true that the physical properties of Roman terracotta lamps have yet to be investigated in any systematic way at all; how much good such information might do I shall discuss later.

The proportion of surviving terracotta lamps that are 'signed' varies with time and place. The earliest lamps signed in Latin date from the 20s B.C., or perhaps slightly earlier,<sup>14</sup> but it was only in the last years of the first century A.D. that signed lamps reached something like their full geographical range.<sup>15</sup> Balil, a knowledgeable investigator, having emphasized that only full excavation reports can answer this question clearly, estimates that in Rome itself some 30–40 per cent of lamps are signed in burials of the period from the late first century down to A.D. 150. In Spain, on the other hand, he guesses that only 10–15 per cent of all terracotta lamps were marked in this fashion.<sup>16</sup> More helpful may be the fact that, to judge from an imperfect catalogue, some 47 per cent of the lamps found in recent excavations at Sarmizegetusa (all naturally of the second century or later) were signed.<sup>17</sup>

<sup>11</sup> H. Dressel, *CIL* xv, pl. III; H. B. Walters, *Catalogue of the Greek and Roman Lamps in the British Museum* (1914), xxiii–xxvi, pls. xli–xliii. Dressel's typology was discussed by N. Lamboglia, 'Apuntes sobre cronología cerámica', *Publicaciones del Seminario de Arqueología y Numismática Aragonesa* III (1952), 87–9 (cf. also R. Bailly, 'Essai de classification des marques de potiers sur lampes en argile dans la Narbonnaise', *Cahiers ligures de préhistoire et d'archéologie* XI (1962), 79–127).

<sup>12</sup> O. Broneer, *Terracotta Lamps* (*Corinth* IV, pt. II) (1930), 70–122; Iványi, 7–22; Ponsich, 3–46; Deneauve, chart opposite pl. xv.

<sup>13</sup> As recently in Provoost (see n. 9) and in Alicu and Nemeş, 21–35. On the principles which ought to underlie a new typology see A. Carandini's com-

ments in Carandini (ed.), *L'instrumentum domesticum di Ercolano e Pompei nella prima età imperiale = Quaderni di cultura materiale* I (1977), 174, with regard to A. M. Bisi Ingrassia, 'Le lucerne fittili dei nuovi scavi di Ercolano', *ibid.* 73–104.

<sup>14</sup> For the 20s as the date of the 'C. Vibi/Tibur' lamps from the Magdalensberg see Farka, 182–3. For other cases see Bailey, I, 345–9. The earliest Greek signatures on lamps found at Delos belong to the last quarter of the second century B.C. according to Bruneau, 157–9.

<sup>15</sup> On the chronology, see below, p. 143.

<sup>16</sup> Balil, 'Marcas', 161. See also his *Estudios sobre lucernas romanas* I (Santiago de Compostela, 1969), 9.

<sup>17</sup> Alicu and Nemeş, 3 (on the excavations since 1973), etc.

This was the sort of proportion of the lamp trade which signed lamps eventually achieved, at least in some areas. As to the significance of signed lamps for the lamp industry as a whole, this will be discussed below.

A recent list of makers' names on ancient lamps included roughly 1,700 in Latin and roughly 400 in Greek.<sup>18</sup> Of the Latin marks, with which this paper is mainly concerned, only 20–25 per cent had a significant circulation away from their primary territory, that is to say away from their presumed area of manufacture. Nonetheless, the lamp industry has a somewhat oligopolistic appearance, for in most places the vast majority of signed lamps exhibit common marks which are also known from far distant sites. Thus the provenances of surviving signed lamps could theoretically be illustrated by a series of several hundred distribution maps, each of which, however, would need to be drawn in different versions to represent diachronic changes.<sup>19</sup> In practice, some patterns of distribution can readily be discovered. The four commonest patterns are the following:

I: Marks found in small numbers within the territory of a single city or some area not much larger, with at most isolated examples from elsewhere. For the Spanish provinces such marks have been catalogued by Balil, and his study *Lucernae singulares* contains many more.<sup>20</sup> In northern Italy such marks are not very common, but one instance is 'Felicio'; besides ten 'Felicio' lamps from Aquileia, only two certain examples are known, one from Cologne and one from Pannonia.<sup>21</sup> Rhineland instances include 'Catulli' (three lamps from Argentorate, one from Moguntiacum) and 'Talutii' (three lamps from Argentorate).<sup>22</sup> In Pannonia one of the few instances is provided by the remarkable lamps, five in all, marked 'Fabi' or 'Fab.'<sup>23</sup> A Rumanian scholar has recently categorized seven lamp-marks as entirely local to Apulum (but one of them, 'Armeni', really belongs to our next category).<sup>24</sup> The total number of signed lamps in this category is relatively small.

II: Some marks have what might be called a regional distribution, the lamps being found in a number of city-territories in the same general region, with at most a handful of lamps scattered further afield and nothing like the distribution through many provinces we shall meet in category III. This type of distribution is not common among Firmalampen, though the 'Armeni' mark and some others follow this pattern; twenty-four 'Armeni' lamps are known from a wide area of Dacia and Lower Moesia, one from Pannonia, none elsewhere.<sup>25</sup> Another instance are the lamps of the mark 'Luc.' or 'L.V.C.', which has been convincingly localized at Puteoli or at least in the bay of Naples area, where it is widely distributed; elsewhere the mark is known from Carthage (one), the Rhineland (one) and, apparently, Miletus (three).<sup>26</sup> Another instance is 'L. Hos. Cri.', widespread in the Gallic and German provinces, but not recorded, as far as I know, elsewhere.<sup>27</sup>

III: Finally we come to the most important patterns, which are in a way similar to each other. The third pattern of distribution covers virtually all Firmalampen. This distribution always includes northern Italy, where it tends to be thickest, and there are also lamps in all or most of the following areas: the Gallic and German provinces, the upper Danube provinces, Dalmatia; most of the commoner marks are also to be found in central Italy, and some in Spain, Dacia and Moesia. The majority of the 'signatures' consist of single *cognomina*.

IV: Marks with this pattern of distribution are to be found in substantial numbers on both the north and the south sides of the Mediterranean, in central and southern Italy on the one side, and in Africa Proconsularis on the other. Some examples are generally to be found in all or some of the following areas: Mauretania, the Spanish provinces, southern France, Sardinia, the German

<sup>18</sup> L. Mercado, *EAA Supplemento* (1973), s.v. lucerne.

<sup>19</sup> Ponsich, 69, provided a rough distribution map of the places where the marks found in Mauretania Tingitana appear, both inside and outside the province, but it is not complete. The highly schematic map of the lamp industry given by A. Leibundgut, 'Zu den römischen Fundlampen der Schweiz', *Arch. Vestn.* xxvi (1975), 106 (also in Leibundgut, 97), is unhelpful.

<sup>20</sup> 'Materiales para un índice de marcas de ceramista en lucernas de fabricación hispánica', *Pyrenae* II (1966), 117–23; *Lucernae Singulares* (1968).

<sup>21</sup> Buchi, 57–8.

<sup>22</sup> J.-J. Hatt, *Gallia* XII (1954), 333.

<sup>23</sup> Iványi, 78, 90 (all of these lamps have several spouts, quite an unusual feature).

<sup>24</sup> C. L. Băluță, 'Lucernae singulares Apulenses', *Arch. Vestn.* xxvi (1975), 111–14; on the 'Armeni' lamps cf. Čičikova, 164.

<sup>25</sup> See previous note.

<sup>26</sup> S. De Caro, 'Le lucerne dell'officina LVC', *RAAN* XLIX (1974), 107–34. For the lamps from Miletus see H. Menzel, *Antike Lampen im römisch-germanischen Zentralmuseum zu Mainz* (corrected ed., Mainz, 1969), nos. 180, 181, 329; for lamps from Athens see n. 77.

<sup>27</sup> The provenances referred to in *CIL* XII. 5682 and XIII. 10001. 155, and in greater numbers by Bailly (see n. 11), 101–6, suggest that most or all of these lamps were made in Narbonensis and in the general region of the River Saône. However no workshop has been found at Vaison in Narbonensis, as suggested by Loeschcke, *LV* 251; see C. Jullian, *REA* I (1899), 154. See further below, p. 140.

provinces. This kind of distribution resembles pattern III in that it covers a number of contiguous provinces or other large regions. The vicinity of Rome, southern France and the German provinces are the places where III and IV overlap. Most of the 'signatures' consist of an abbreviated form of a three-element Roman name, e.g. 'C. Clo. Suc.'

It is not claimed that all Latin-signed lamps fall into one of these categories. One obvious exception is the only mark which was exported from the eastern provinces in any significant quantity under the Empire (though some of those found elsewhere are probably local products), the 'Romanesis' lamps which were originally manufactured in Cnidus or Miletus.<sup>28</sup> But there is only a handful of 'Romanesis' lamps in the western provinces. The above categories could also unquestionably be refined, especially if more information were available about the lamps of Italy and the Gallic provinces.

Some statistics illustrating categories III and IV are given in Table I, the purpose of which is to show the relative commonness of various marks, some of them very common, some of them moderately so, in certain selected places. Be it noted that the table does not permit comparisons between the different places listed, unless they are made with extreme caution; this is partly because of the wide divergence in the quality of the printed sources.

Table I. Distribution of Selected Lamp 'Signatures'

	ATIMETI	CRESCES	FORTIS	PHOETASPI	STROBILI	VIBIANI	C. CLO. SVC.	C. IVN. DRAC.	C. OPPI RES.	IVNI ALEXI
*†Northern Italy	130+	238+	676+	34	120	288+	9	3??	13-16?	2??
Aquileia	53	155	342	10	36	180	—	—	—	—
Switzerland	17	2	67	17	32	2	—	—	—	—
Vindonissa	17	—	49	11	15	—	—	—	—	—
Lauriacum	—	64	18	—	1	31	—	—	—	—
*†Pannonia	50	258	541	5	37	98	1	—	—	—
Vindobona	4	13	32	—	4	2	—	—	—	—
*Dalmatian coast (three sites)	36	80	229	16	41	76	—	—	—	—
Dacia	9	9	168	—	30	1	—	—	—	—
Danubian <i>limes</i> in Bulgaria	4	1	28	—	6	1	—	—	—	—
*†Gallia Narbonensis ( <i>CIL</i> only)	9	7	50+	11	23+	5	6	6	15	1
*†German and other Gallic provs. ( <i>CIL</i> only)	67	8	c. 347	19	108	15	8	6	27	5
*†Italy: <i>CIL</i> ix and xi (except Regio viii)	7	12	46+	5	10	37	8	4	19	—
*†Italy: <i>CIL</i> xv	4	7	81+	7	31+	20	97	22	276	7
*†Italy: <i>CIL</i> x (except Sardinia)	6	—	15	5	14	—	2	30	7	23
*†Spain	1	1	4	1?	5	1	6	4(5?)	27+	7
Sardinia	1?	—	—	—	—	2	13	16	27+	15
*N. African provs.	—	1	2	—	1	—	160+	121+	163	104
Carthage	—	—	1	—	1	—	32	7	14	4
Sabratha	—	—	—	—	—	—	—	26	2	—
Mauretania Tingitana	—	—	1	—	—	—	—	1	10	9

Asterisks denote places where more of these lamps undoubtedly exist, uncatalogued. Daggers denote places where museum holdings of lamps of non-local provenance may have caused some distortion. In counting the above lamps, I have included all variant marks.

Sources: NORTHERN ITALY: *CIL* v, *CIL* xi (for Regio viii), E. Pais, *Supplementa Italica* (= *Mem. Acc. Linc.* ser. 4, 5 (1888)), Buchi.<sup>29</sup> AQUILEIA: Buchi. SWITZERLAND: Leibundgut. VINDONISSA: Loeschcke, *LV*. LAURIACUM: Deringer. PANNONIA: Iványi. VINDOBONA: Neumann. DALMATIAN COAST: F. Bulić, 'Descrizione delle lucerne

<sup>28</sup> See G. Heres, 'Die Werkstatt des Lampentöpfers Romanesis', *Staatliche Museen zu Berlin. Forschungen und Berichte* x (1968), 185-211. The localization at Cnidus was first suggested by Walters, *op. cit.* (n. 11), xxxvi. Heres argued for Miletus (203-6). The period stretches from the 70s A.D. to the reign of Hadrian (Heres, 201-3).

<sup>29</sup> Since 'C. Clo. Suc.', 'C. Iun. Drac.', 'C. Oppi Res.' and 'Iuni Alexi' are not found at Aquileia, they are not discussed in Buchi's catalogue and may be slightly under-reported in line 1 of this table. I know of no lamp with one of these marks and a definitely north Italian provenance, apart from those listed in *CIL* and Pais.

fittili . . . nell' i.r. Museo di Spalato', *Bull. di arch. e storia dalmata* VIII (1885), 127-9, continued in the same periodical down to 1923 (full references in Buchi) (Salona); G. De Bersa, 'Le lucerne fittili romane di Nona conservate al Museo archeologico di S. Donato di Zara', *ibid.*, xxviii (1905), 170-6, xxix (1906), 80-3, xxxviii (1915), 75-83 (Aenona); M. Abramčić-A. Colnago, 'Untersuchungen in Norddalmatien', *ĴÖAI* XII (1909), Beibl. cols. 66-75. DACIA: Gostar, Alicu and Nemeş. BULGARIA: Čičikova. GALLIA NARBONENSIS: *CIL* XII. GERMAN AND OTHER GALLIC PROVS.: *CIL* XIII.<sup>30</sup> ITALY (CENTRAL AND SOUTHERN): *CIL* IX, X, XI, XV. SPAIN AND PORTUGAL: *CIL* II, with additional references from Balil, 'Marcas', and Sotgiu. SARDINIA: Sotgiu. N. AFRICAN PROVS.: *CIL* VIII for the first five columns, Sotgiu for the remainder.<sup>31</sup> CARTHAGE: Deneauve. SABRATHA: Joly. MAURETANIA TINGITANA: Ponsich.

Types as well as makers' names are widely distributed. This is as true for the Bildlampen types as for the Firmalampen types: Loeschcke 1, for example, is to be found in most parts of the Empire. Unfortunately, since Dressel was the only *CIL* editor who attempted the tedious task of cataloguing the types as well as the marks of the signed lamps for which he was responsible (those of Latium in his case), we cannot yet produce a distribution chart which has even the limited coverage of the one given above. It is obvious, however, that there is a marked difference between Bildlampen and Firmalampen in this respect; while the marks that do appear on Firmalampen virtually never appear on any types other than Loeschcke IX and X (themselves closely related) and their variants, some Bildlampen marks appear on many different types. 'C. Oppi Res.', for instance, is said to appear on no fewer than twelve of the types in Dressel's typology.<sup>32</sup> Whether this difference between Firmalampen and Bildlampen means anything remains unclear, but the diffusion of types—pointing to strong interconnections between the centres of manufacture—is an uncontested fact.

There are other variables besides makers' marks and types: colour of clay and quality of manufacture are two obvious ones, though each of them may be hard to judge in any particular case, because of long use and because of what has happened to the lamp since it was discarded.<sup>33</sup> More useful may be size, and also the presence or absence of a handle. More will be said about these two features in the following section.

### III. IMPORTED AND LOCAL PRODUCTS

The concepts 'import' and 'export' do not have unmistakably clear meanings as far as the Roman Empire is concerned. The crossing of a provincial boundary is in itself of little significance. It might be better to speak of 'long-distance' trade, but how are we to define a long distance? The only useful response is to keep in mind that many particular objects may be marginal cases in this respect.

It is widely agreed that all the makers' names in category III were originally used in Northern Italy, though evidence for the exact whereabouts of specific workshops is naturally limited. The old theory that the original 'Fortis' lamps came from Savignano sul Panaro, near Modena, has a good deal to recommend it, and contrary arguments are ill-founded.<sup>34</sup> But Loeschcke's attempts to localize the Celer workshop at Tortona and that of Strobilus

<sup>30</sup> But on lamps of non-local provenance registered in *CIL* XIII see Leibundgut, 41.

<sup>31</sup> This may mean that the marks in the first five columns have been slightly under-reported, but the number of Firmalampen in North Africa is in any case certainly insignificant.

<sup>32</sup> Balil, 'Marcas', 168. However some of these types were counted by Loeschcke merely as variants.

<sup>33</sup> Leibundgut, *Arch. Vestn.* xxvi (1975), 104, lists the following criteria for distinguishing workshops: clay, glaze, 'Brand', i.e. presumably intensity of firing, type of handle, carefulness of workmanship, arrangement of vents; but of these features only the handles are really much use at present.

<sup>34</sup> The specific site is argued from an inscription on a tile found there reading 'Ad forn(acem) or

(-aces) Cat(. . . ?) L. Aemilii Fortis' (*CIL* XI. 6689. 12), which is said to have come from a kiln (found or just inferred?) that produced a number of 'Fortis' lamps (A. Crespellani, *BdI* 1875, 192-5). In addition some ground in this vicinity was once known as Campo Forte (Crespellani, referring to a *catasto* of 1531). G. E. F. Chilver doubted the identification (*Cisalpine Gaul* (1941), 175) because 'a lamp at Patavium bears the mark ANCHARI FORTIS, suggesting that the name of the makers was not Aemilius at all'. However *CIL* V. 8114. 54w is misleading here, and the original report (V. Devit, *Le antiche lapidi romane della provincia del Polesine* (Venice, 1853), 105), besides referring to Rovigo and not Patavium, shows that no such lamp existed (cf. also E. Zerbinati, *Padusa* VII (1971), 48, 56).

at Magreta, also near Modena, were based on insufficient evidence.<sup>35</sup> (The minor—though early and interesting—workshop of Hilario, which Loeschcke located at Parma, has been decisively shown to belong to Bononia.)<sup>36</sup> However the North Italian origin of the category III marks is indicated by the simple fact that they are found in the greatest numbers in that region (with Pannonia perhaps the nearest rival). Furthermore we know from the elder Pliny of the export and reputation of the pottery of Mutina;<sup>37</sup> and more pottery kilns are attested for Regio VIII than for any other region of Italy.<sup>38</sup>

The ultimate origin of the makers' marks in category IV is less certain. According to Deneauve, who catalogued the lamps of Carthage, a substantial number of the commonest marks in North Africa, including those in the above table, were scarcely ever made in North Africa at all.<sup>39</sup> This is beyond belief, and one of Deneauve's supposedly Italian marks, 'M. Nov. Ius.', was certainly produced in a workshop at Hadrumetum (though it did not necessarily originate there).<sup>40</sup> The very sketchy published report of this site mentions a number of wasters, as well as indicating that 'M. Nov. Ius.' was the only mark present.<sup>41</sup> Other scholars have treated this and other category IV marks as North African in origin.<sup>42</sup> The deplorably small number of lamps that derive from dated archaeological contexts does nothing to settle the issue. The lack of IV lamps at Pompeii and Herculaneum probably results from their not having been made anywhere until after 79. On the whole it is easier to understand the distribution pattern if the lamps were first made in Africa. If they had originated in the vicinity of Rome,<sup>43</sup> or (as might be imagined) around the bay of Naples, it would be hard to explain how they ever came to spread, either by export, by branch workshops or by unauthorized imitation, to so many relatively out-of-the-way sites in North Africa. There is also a certain North African flavour to some of the *cognomina* which appear (in abbreviated forms) on the category IV lamps. The question would need a detailed investigation; it might emerge that the whole group of names tended to be particularly common in North Africa (this is true of 'Restitutus'; cf. 'C. Oppi Res.').<sup>44</sup> which would favour North Africa as the ultimate origin of the category IV signatures.

Since the time of Loeschcke and A. Gnirs,<sup>45</sup> and especially since the former's crucial study *Lampen aus Vindonissa*, it has generally been recognized that many Firmalampen were locally produced in the provinces.<sup>46</sup> Loeschcke believed that only a small number of the Vindonissa lamps were imported from Italy,<sup>47</sup> which might imply that most other

<sup>35</sup> LV 491-2 and 290 respectively. His source on the supposed Celer workshop was S. Varni, *Appunti di diverse gite fatte nel territorio dell'antica Libarna I* (Genova, 1866), 44-7. Even Varni's informant seems only to have seen four of the 400-500 Celer lamps supposed to have been found on the site at Tortona (Dertona) in 1841. There never was any serious evidence for Magreta—in itself a plausible enough site for a lamp workshop—as the home of Strobilus (see Crespellani, op. cit., 196-8).

<sup>36</sup> M. C. Gualandi Genito, 'Una fabbrica di fittili nella Bononia Augustea: L'officina di Hilario', *Atti e Mem. Dep. St. P. per le province di Romagna* n.s. xxiv (1973), 265-313, against Loeschcke, LV 244.

<sup>37</sup> Pliny, *NH* xxxv. 161 (on the subject of pottery): 'habent et Trallis ibi opera sua et in Italia Mutina, quoniam et sic gentes nobilitantur et haec quoque per maria, terras ultro citro portantur, insignibus rotae officinis'. More will be said about this below, p. 136.

<sup>38</sup> N. Cuomo di Caprio, 'Proposta di classificazione delle fornaci per ceramica e laterizi nell'area italiana, dalla preistoria a tutta l'epoca romana', *Sibrium* xi (1971-2), 443-57.

<sup>39</sup> Deneauve, 85 (no argument is offered). This view also seems to be held by Provoost (see n. 9), 561. Cf. below, n. 48. According to Joly (97), the earliest marks at Sabratha, in the first century A.D., were on lamps imported from Italy, but she does not commit herself to any such opinion with regard to 'C. Oppi Res.', 'Iuni Alexi' and the other major marks of the second century.

<sup>40</sup> Deneauve was aware of the Hadrumetum dis-

covery (86), but asserted the Italian origin of the mark.

<sup>41</sup> Excavation of A. Truillot, reported by J. Toutain, *Bull. arch. com. trav. hist.* 1941-2, 282-3.

<sup>42</sup> e.g. Balil, 'Marcas'. But attempts to specify the locations of the major North African workshops other than 'M. Nov. Ius.' have not hitherto been well argued. The locations proposed by L. Carton (*Bulletin de la Société de géographie et d'archéologie d'Oran* xxxvi (1916), 61-103) are still sometimes cited, but they are entirely unreliable.

<sup>43</sup> That 'C. Oppi Res.' lamps were eventually made in great numbers at Rome is not of course in doubt (cf. now the remarks of O. Mocchegiani Carpano in Carandini (ed.), *L'instrumentum* (see n. 13), 172-3).

<sup>44</sup> On Restitutus/Restutus as a translation of a Punic name see H.-G. Pflaum in E. Swoboda (ed.), *Carnuntina* (1956), 144.

<sup>45</sup> See in the first place Loeschcke, 'Keramische Funde in Haltern . . .', *Mitteilungen der Altertums-kommission für Westfalen* v (1909), 101-322; A. Gnirs, 'Eine römische Tonwarenfabrik in Fasana'; *Jahrbuch für Altertums-kunde* iv (1910), at 82-4.

<sup>46</sup> cf. H. Gummerus in *RE* s.v. Industrie und Handel, col. 1470; E. Hug in *RE* s.v. lucerna, col. 1594. In the opinion of T. Frank, *An Economic History of Rome*<sup>2</sup> (1927), 224, Loeschcke had 'proved by measurements' that most of the signed lamps with widespread names were produced by local potteries. For a recent statement see Leibundgut, 75.

<sup>47</sup> LV 491.

provincial Firmalampen are also of non-Italian manufacture, since they are found even further from North Italy. This is in fact the view of many scholars. Rostovtzeff still wrote (in 1926) as if Italian exports dominated the provincial markets for a period;<sup>48</sup> but of course he might have changed his opinion in the light of later publications, such as Iványi's catalogue of the Pannonian lamps, with its substantial number of Firmalampen moulds. For Rostovtzeff the lamp industry fitted into his overall theory about the decline of the Italian economy in the second century in consequence of the supposed loss of external markets. How much validity this theory possesses, in particular for agricultural products, is an important question which cannot be discussed here.

More surprising than Rostovtzeff's view are the recent judgements of some scholars, including lamp-specialists, to the effect that some quite large proportion of signed lamps was transported over very long distances to be sold. Thus a specialist such as Balil writes as if a long list of marks found on lamps in Spain belonged exclusively to imports, and he evidently considers many, if not all, of the lamps in question to be the products of 'grandes empresas [con] notable capacidad exportadora, situadas generalmente en Italia o en Africa'.<sup>49</sup> As already mentioned, Deneauve holds that almost every lamp in category IV found at Carthage was imported from Italy, and he presumably would argue that other lamps of the same marks found elsewhere in Africa were also manufactured in Italy.

These are perhaps extreme instances, but many scholars who have published groups of provincial lamps have classified a considerable number of them as imports from Italy, or sometimes, in the case of category IV lamps, as imports from North Africa.<sup>50</sup> The procedures which have been used to distinguish locally produced lamps from imports from other provincial locations and from Italian imports have generally been unscientific. In effect the normal procedure has been to divide lamps into those of inferior quality, supposedly produced locally, and those of superior quality, supposedly imported.<sup>51</sup> No doubt this leads to some correct results, but control is lacking. How do we know the limits of the provincial potters' skills? And some fairly shoddy Firmalampen were produced in Italy, though the literature has not made this fact easy to appreciate until recently. Some scholars have obviously felt the difficulty of drawing this line between local and imported lamps, but usually they take the plunge.<sup>52</sup> A notable exception is M. Ponsich, who, faced with the problem of fixing the origins of the signed lamps found in Mauretania Tingitana, refused to pass judgement.<sup>53</sup>

Size is one criterion which has been invoked to distinguish Italian-made from non-Italian Firmalampen, the latter allegedly being smaller.<sup>54</sup> But the criterion is of limited value, since the so-called 'imitations' manufactured in the provinces were often not made by a technique which would have turned them out smaller than the originals.<sup>55</sup> The following table reflects a sample of the evidence.

These are obviously very partial figures, but while it is clear that sizes do tend to be somewhat smaller in those places, such as Dacia, which were very remote from the original centres of manufacture,<sup>56</sup> it is obviously impossible to use measurements to distinguish

<sup>48</sup> SEHRE<sup>2</sup>, 173: '... the factory (or the shops) of Fortis in North Italy, which at first almost monopolized the production of clay lamps, lost its worldwide market in the second century, its products being replaced in the various provinces by local lamps of the same shape, which sometimes even reproduced the Fortis trademark.' His ensuing comments on the lamps found in North Africa (to the effect that in 'the local African markets' Italian lamps were supplanted by lamps made in Carthage, which were in turn supplanted 'by lamps of local make', all this before 193) are without foundation. In the first century, according to D. M. Bailey (*Greek and Roman Pottery Lamps* (1963), 19, 24), Italian lamps 'were exported all over the Roman world', and this continued to some extent later; indeed most of the lamps in category IV were Italian. Even Leibundgut (98) writes of a worldwide lamp-trade in the first century.

<sup>49</sup> Balil, 'Marcas', 159. Going back to a com-

petent earlier work, one reads that the Bildlampen used in Corinth throughout the first century A.D. were imports from Italy (Broneer, *op. cit.* (n. 12), 59).

<sup>50</sup> Such a tendency can be seen in the works of Gostar, Deringer, Čičikova (all cited in n. 4), as well as in those cited in the preceding notes.

<sup>51</sup> So already Loeschcke, *LV* 494.

<sup>52</sup> Colour, incidentally, must be used with extreme caution. To suppose that red-brown and brick-red are the colours of lamps made in Northern Italy (cf. Bailey, II, 277) would simply be incorrect.

<sup>53</sup> Ponsich, 68. And for appropriate caution in face of this problem, cf. Perlzweig, 2.

<sup>54</sup> Loeschcke, *op. cit.* (n. 45), 210, etc.

<sup>55</sup> Concerning a technique which did have this effect, see below, p. 138.

<sup>56</sup> The Firmalampen of Novaesium have a median length of only 7.5 cm, including 1-2 cm of handle (figures given in Vegas' book).



Table II: Median Lengths of Selected 'Firmalampen'  
(in centimetres)

	Atimeti	Fortis	Strobili
Aquileia	9.0	9.6-9.7	10.9-11.0
Switzerland	8.5	9.1	10.4
Lauriacum	n.a.	9.35-9.6	n.a.
Pannonia	9.5	8.5	11.0-11.1
Sarmizegetusa	n.a.	8.1	n.a.

*Sources*: compiled from Buchi (Aquileia), Leibundgut (Switzerland) (in this case the measurements ignore the handles which are common on lamps found in the German provinces), Deringer (Lauriacum), Iványi (Pannonia), Alicu and Nemeş (Sarmizegetusa).

imported from non-imported lamps in, say, Pannonia. The great majority of Pannonian Firmalampen were without doubt made in Pannonia, but their size does not provide evidence of the fact.

In truth most simple terracotta lamps must have been made near to the places where they were sold at retail. Transport costs alone are enough to make this certain. The distances over which much of the supposed exporting of lamps is said to have taken place are often large, such as from south of the River Po to sites on the Danube and in Spain, or from central Italy to inland sites in Numidia. Such a trade would have been, as Frank realized long ago, economically bizarre.<sup>57</sup> The raw material for making terracotta lamps was present in virtually every region of the empire, and the technical skill needed to make basic lamps was not very great (though perhaps greater than was available in some of the European provinces when they were first conquered). It cannot have been profitable to export such items—cheap and easy to produce—over any such long distances, except in special circumstances.

It is true that to find specific costs for land transport in the Roman Empire we have to range as far afield as Cato's handbook on farming and the Diocletianic price-edict, and even these sources fail to give us clear and definitely applicable answers.<sup>58</sup> The whole subject of Roman transport prices deserves a new treatment, which would have to take into account the extensive and problematical evidence of the papyri.<sup>59</sup> At present it is quite impossible to calculate how far, for instance, one could transport a consignment of lamps over land, or for that matter by sea, without adding 50 per cent to their cost. Any land journey of hundreds of miles would presumably have done this and more, but definite figures are lacking.

The best approach is to consider a concrete situation. The standard price of a terracotta lamp at Pompeii and elsewhere in the early Empire appears to have been a single *as*.<sup>60</sup>

<sup>57</sup> Frank, loc. cit. (n. 46).

<sup>58</sup> Specific information about land transport costs: Cato, *De agri cult.* 23; *Ed. Diocl.* xvii (pp. 148-9, ed. S. Lauffer: 20 *denarii* a mile for a wagon load of 1,200 Roman lbs; this is *not* a market price). Modern discussions: C. Yeo, 'Land and Sea Transportation in Imperial Italy', *TAPhA* LXXVII (1946), 221-44; A. H. M. Jones, 'The Economic Life of the Towns of the Roman Empire', *Recueils de la Société Jean Bodin* VII (1955), 163-4 = *The Roman Economy* (1974), 37; A. Burford, 'Heavy Transport in Classical Antiquity', *Ec. Hist. Rev.* XIII (1960), 1-18; R. P. Duncan-Jones, *The Economy of the Roman Empire: Quantitative Studies* (1974), 366-9.

<sup>59</sup> The Egyptian information was formerly collected by A. C. Johnson, *Roman Egypt (Economic Survey of Ancient Rome II)* (1936), 403-7. The main problem is that since Egyptian prices for basic commodities were (in appearance) several times lower than Italian ones (on this problem see most

recently J. Schwartz, 'La monnaie et l'évolution des prix en Egypte romaine', in G. Vallet (ed.), *Les dévaluations à Rome, époque républicaine et impériale* (1978), 169-79), market prices of transport must have been lower too—but how much lower? It is worth noting the following examples: (1) *BGU* III. 802 (A.D. 42): half an *artaba* of lentils for transporting a donkey-load from Theadelphia to Arsinoë—say the equivalent of 12 *asses* for a journey which is 24 km one way; (2) *P. Lond.* I. 131 (A.D. 79): 5 dr. (= 20 *asses*) a day for a wagon carrying sheaves; (3) *P. Oxy.* VII. 1049 (late second century): nine donkeys with drivers and loaders cost 29 dr. 1 obol a day, twelve donkeys with drivers and loaders cost 37 dr. 5 obols.

<sup>60</sup> *CIL* IV. 5380 gives 1 *as* as the price of a lamp (if that is what is meant by 'inltyonium'), type naturally unspecified. *CIL* VIII. 10478. I. 22642; XIII. 10001. 19; *AE* 1940, no. 164, describe lamps with inscriptions such as 'emite lucernas colatas ab asse' (there is some obscurity here also).

We might suppose for the sake of example that a consignment of 1,000 lamps, such as might be carried in a single cart or by several pack animals, would produce a profit, with everything paid for except transport, of 150–250 *asses*. Two men and the required animals could scarcely be supported for much less than 15 *asses* a day at Italian prices of the first century A.D.,<sup>61</sup> and further allowance has to be made for the cost of equipment. There is evidence to suggest that this was about the equivalent of the daily cost of hiring a team of three donkeys in mid-second-century Egypt,<sup>62</sup> and hence the Italian rate was probably much higher—we might guess 30–40 *asses* a day. The speed of such a convoy is not likely to have averaged more than twenty-five miles a day. Hence a round trip of 200 miles would probably have made profit impossible. This obviously speculative conclusion can only be rejected if one or more stages in the argument can be invalidated. In practice lamps are not at all likely to have been carried even a hundred miles unless there was an assured market at the other end of the journey, a market large enough to be profitable but also backward enough to lack qualified potters of its own.

Even with the much lower costs per ton-mile of sea and river transport,<sup>63</sup> export is likely to have been restricted to special circumstances of this kind. Shipping simply from one port to another was not an expensive business, but even in this kind of case the presence of intermediary entrepreneurs is likely to have prevented the producer from making an appreciable profit; the lamps would either have to be sold to a merchant at a discounted price, or the maker might himself lease space on shipboard (for the goods and someone to accompany them).<sup>64</sup>

Further evidence for the production of large numbers of signed lamps far away from their original centres of production is offered by the surviving moulds or *matrices*. Pannonia is the most striking case, having produced at least fifty moulds for the lower halves of Firmalampen in addition to many moulds for the upper halves and for other types of lamps.<sup>65</sup> No fewer than twelve of the lower moulds bear the 'Fortis' mark, while others have the 'Aprio', 'Cresces', 'Faor', 'Iegidi', 'Lucius', 'Octavi', 'QGC', 'Sexti', 'Strobili', and 'Vibiani' marks, all of which almost certainly originated in Northern Italy. Curiously very few moulds for Firmalampen have been found in Italy itself.<sup>66</sup> The only other published mould for the lower half of a Firmalampe which has a secure provenance is a 'Cresces' mould from Upper Germany (as it happens, from a region where very few 'Cresces' lamps are known).<sup>67</sup> From the same province we have a model used for making Firmalampen moulds, this one bearing the 'Communis' mark<sup>68</sup> (a number of similar, but anonymous, models are known from Pannonia and one at least from Noricum).<sup>69</sup> What matters here is that the Pannonian moulds are so exceedingly numerous—and it is worth pointing out too that they come from widely separated sites within the province—that there must have been very extensive local production.

Of course some lamps were certainly exported over long distances. This is nicely and unequivocally illustrated by a consignment of some one hundred Bildlampen of the maker C. Clodius which was found, where it was lost, in a shipwreck in the Balearics, presumably on the way from Italy to Spain, the date being in the 40s A.D., early in the history of signed lamps.<sup>70</sup> Progressive Romanization and urbanization and the prosperity

<sup>61</sup> For a selection of pertinent prices see R. Etienne, *La vie quotidienne à Pompei* (1966), 229–33.

<sup>62</sup> See n. 59.

<sup>63</sup> On prices for sea-transport *Ed. Diocl.* xxxvii (pp. 200–1, ed. S. Lauffer) is the only specific source from outside Egypt (assorted routes priced in *denarii per castrensis modius*). See J. Rougé, *Recherches sur l'organisation du commerce maritime en Méditerranée sous l'Empire romain* (1966), 369–73. On the Egyptian evidence for river-transport prices see Johnson, *op. cit.* (n. 59), 400–3, 407–8; O. M. Pearl, 'Transport Charges in Egypt in the Era of Inflation', *TAPhA* lxxxiii (1952), 74–9; *P. Oxy.* xlV. 3250 (c. 608 A.D.).

<sup>64</sup> A certain amount of information on the latter practice can be found in Rougé, *op. cit.*, 287–9, 366–8.

<sup>65</sup> Iványi, 26–7, 310–19; T. Szentléleky, 'Aquincumi mécskészítő műhelyek', *Budapest Régiségei* xix

(1959), 167–203; A. Balil, 'Forme di lucerne romane con signature di ceramista', *Apulum* vii/1 (1968), 461–4; Buchi 203–4. The lower-half mould of unknown provenance in Prague (with the name 'Iusti') described by Haken, *op. cit.* (n. 4), 27, may well be Pannonian.

<sup>66</sup> One from Fasana (near Pola): Gnirs, *op. cit.* (n. 45), 82 (upper half); five from Aquileia, plus some unpublished fragments: Buchi, 203–5 (three lower halves (Cresces), two upper); one once at Vercellae: *CIL* v. 8114. 94 ('Mutini'—but this seems quite suspect). In reality more must exist.

<sup>67</sup> Leibundgut, *Arch. Vestn.* xxvi (1975), 109.

<sup>68</sup> Leibundgut (see n. 4), 86.

<sup>69</sup> For the latter see F. Wiesinger, *ÖAI* xxi–xxii (1922–4), Beibl. col. 417 (Ovilava).

<sup>70</sup> C. Domergue, 'Un envoi de lampes du potier Caius Clodius', *Mélanges de la Casa de Velazquez* ii (1966), 5–40.

of certain groups clearly increased the market for terracotta lamps in most of the western provinces in the first and second centuries. Whether other factors encouraged the diffusion of lamps can only be a question for interesting speculation. Greater availability of olive-oil in areas too cold for the growth of olive trees may have encouraged the use of such lamps, though they could be fuelled with other substances.<sup>71</sup> It is also possible that Firmalampen themselves increased the size of the market by changing hands for lower prices than the lamps previously available.<sup>72</sup> In some instances Roman lamps were exported to regions beyond the frontiers where there was no local product with which to compete.<sup>73</sup> And more important, in many regions of the empire local production of lamps must have been preceded by a period in which there was a market for imported terracotta lamps. However, though we lack firm chronology for lamp production in most regions, this stage was certainly over by the end of the first century A.D. not only in Italy but in all the more advanced provinces of the west; the only exceptions are likely to have been Mauretania, the more remote areas of Tarraconensis, and Britain. In these latter areas, such signed lamps as are found may all be imports, even at later dates. An importing area could of course become an exporting area, as must have happened with Pannonia, from which lamps were probably exported after a certain date to Dacia and elsewhere.

Certain other circumstances could make an export trade in lamps natural, if not rational. Lamps from Mutina probably benefited from the reputation of an established trade in other pottery made there. This trade, according to the elder Pliny,<sup>74</sup> was carried on by land and sea and made Mutina known everywhere. The primary ware in question may not have been lamps but something more refined, *terra sigillata*. But since he was writing in the mid-70s, when Firmalampen production had probably undergone a rapid and fairly recent expansion, Pliny is likely to be alluding also to the export of lamps. It is to be noted that the few extant lamps which state their place of origin all refer to Mutina—but there are only six of them (their provenances are Bologna, Padua, Rimini, Monza, and Vindonissa).<sup>75</sup>

Another possibility is this: if a merchant transporting goods from, for instance, Pannonia to Aquileia found himself without a load of wine or oil for the return journey, and lamps could be acquired at a good price, he may have thought it better to transport them back to Pannonia rather than return with unladen pack-animals or carts. In general, it may be added, transport is likely to have been cheaper on established trade-routes (such as this one).<sup>76</sup> We have also to reckon with the certainty that some lamps were *neither* imported for trade *nor* locally produced, but were simply carried over some long distance in the luggage of a migrating person such as an official or a legionary.<sup>77</sup>

The problem remains of distinguishing imports from local products object by object. This is far harder to do than most archaeological writers on the subject have recognized, all the more so because at any given place lamps may have been imported from various directions. One local peculiarity which helps is that Firmalampen with handles are evidently for the most part products of the German provinces or of west central Italy,<sup>78</sup>

<sup>71</sup> The importance of olive-oil: Leibundgut, 129. Other fuels: D. M. Bailey, op. cit. (n. 48), 10.

<sup>72</sup> cf. Deringer, 19.

<sup>73</sup> cf. Gostar, 150-2; J. Wielowiejski, *Kontakty Noricum i Pannonii z ludami Północnymi* (1970), 62.

<sup>74</sup> See above, n. 37.

<sup>75</sup> The marks in question are (1) 'Mut/Cerinthus f.': *CIL* v. 8114. 93 (Monza), xi. 6699. 51b (Rimini), unpublished (Padua: this lamp, which I saw in the Museo Civico in July 1975, has the inventory number XXI-188); (2) 'Mut./Menander/f.': Loeschcke, *LV* no. 855 (Vindonissa), with information about another lamp with a similar mark from the same area and perhaps from Vindonissa; (3) 'Mu./Priscus/f.' (apparently): *CIL* xi. 6699. 163 (Bologna). For some other possible cases see Buchi, 120. The provenances of these six lamps are about twenty-five miles (Bologna), seventy (Padua), ninety (Rimini), 110 (Monza) and 230 (Vindonissa) from Modena, which may suggest the possible range of exportation; but no conclusions can be drawn, since these lamps

are obviously exceptional (and may not even have been made at Modena).

<sup>76</sup> cf. Rougé, op. cit. (n. 63), 370-1, on the disparities in the tariffs for various sea-routes in Diocletian's Edict. Strabo (iv. 207) describes the regular trade route from Aquileia to Nauportus (only about fifty miles), from which goods could be moved eastwards by river. The trade route down the east coast of the Adriatic must also have carried north Italian lamps.

<sup>77</sup> This is likely to account for oddities such as the two Firmalampen from the agora of Athens (for which see Perlzweig, 83); for Miletus see n. 26.

<sup>78</sup> Vegas, 76: 'Die grosse Mehrheit der [Firma] lampen in den germanischen Provinzen hat einen Henkel aus der Form gepresst und zwei seitliche Knuppen auf der Schulter...'. This is rare elsewhere, except in western central Italy (and Bailey, II, 277, goes too far in saying that 'central Italian Firmalampen normally have handles').

but most other regions show no such distinctive differences. Size, as has already been suggested, is less help than many have supposed. Small Firmalampen (say under 7 cm in length) are somewhat commoner in some provinces than they are in Italy or Pannonia, but not to the extent that one can say with any confidence that any particular lamp or group of lamps must have been produced locally.

In theory it might be possible to tell local from imported lamps by laboratory analysis of the clay. Several promising techniques are available (heavy-mineral analysis, optical-emission spectroscopy, etc.),<sup>79</sup> and some recent work on *terra sigillata* raises hopes. However there are considerable difficulties to be overcome, besides the obvious financial and organizational ones, before such methods will tell us much that is really helpful about the origins of lamps. The first aim would be to decide whether given groups of lamps could or could not have been made within certain areas; whether, for example, the best quality Firmalampen from Lauriacum could or could not have been made in the vicinity of Lauriacum. One problem is that it would be hard to establish the possible range of clays available near Lauriacum (and the discovery that the lamps must have been made more than, say, twenty miles away would not by itself contain much historical interest). Then if the lamps were shown to come from outside this area, there remains the problem of choosing between the possible origins. Furthermore, to show the existence of any significant pattern in the physical composition of 'C. Oppi Res.' lamps—to take an exceptionally interesting case—samples from very many lamps would have to be analysed from a variety of collections in Tunisia, Algeria, Spain, Italy and elsewhere.

We should return to the patterns of distribution enumerated above (p. 129). Patterns I and II represent respectively the more modest and/or short-lived local workshop and the more successful kind; behind pattern II there may also lie in some cases some subsidiary places of manufacture.<sup>80</sup> But the important point is that patterns III and IV can only have existed in their denser forms if lamps with the marks in question were produced in many different centres.<sup>81</sup> Wherever substantial numbers of lamps of any given mark are found, most of them are likely to have been made in the vicinity. I take it to be virtually certain that 'Fortis' lamps were made not only near Mutina, but elsewhere in northern Italy, in or near Rome, and at certain sites in the Gallic and German provinces and in Pannonia, Dalmatia and Dacia; but with this and every other mark the exact number of manufacturing places naturally remains uncertain.

It is tempting to believe that for any well-reported site (and few indeed of these exist), one can tell which are the marks numerous enough to prove local production. At Aquileia, for instance, seven marks are represented by ten or eleven lamps each, whereas only four are represented by six to nine lamps each, and, by contrast, dozens are represented by one to four lamps each. Thus there is a discontinuity in the frequency with which marks are represented at Aquileia; and it might be reasonable to think that in this case the marks that appear ten times or more, which account for 90·4 per cent of the signed Firmalampen of Aquileia, are the ones which were actually made there. Similarly, to take Iványi's figures for Oszöny (Brigetio) as a random example, four marks and their variants account for 55 per cent of the Firmalampen, being represented by thirty-three, twenty, fourteen and eleven lamps. Afterwards comes a discontinuity, followed by many marks which appear six or fewer times. Most of the latter, as of the former, are marks well known elsewhere, and probably few if any of them were made in the immediate vicinity of Brigetio. The four marks ('Cresces', 'Fortis', 'Vibiani' and 'Victor/Victori/Victoris') can plausibly be regarded as local products. But all this of course assumes that each mark tended to be made by a separate workshop. The assumption has often been questioned, and in what follows it will be re-examined.

<sup>79</sup> cf. D. P. S. Peacock, 'The scientific analysis of ancient ceramics: a review', *World Archaeology* 1 (1969-70), 375-89; M. S. Tite, *Methods of Physical Examination in Archaeology* (1972), esp. 315-23; M. Picon, 'Recherches de laboratoire sur la céramique antique', *Rev. Arch.* 1973, 119-32; T. K. Earle-J. E. Ericson, in Earle-Ericson (edd.), *Exchange Systems in Prehistory* (1977), 5; M. Maggetti-T. Küpfer, 'Composition of the terra sigillata from

La Péniche (Vidy/Lausanne, Switzerland)', *Archaeometry* xx (1978), 183-8 (with other bibliography). F. Oertel (*CAH* x. 396) was already calling for chemical analysis of the lamps to settle the import question.

<sup>80</sup> But for another and perhaps more likely explanation, itinerant sellers, see below, p. 142.

<sup>81</sup> Thin distribution of patterns III and IV may have resulted from export and/or unauthorized imitation.

IV. IMITATIONS, BRANCHES AND *INSTITORES*

A feature of Firmalampen which has been cited as evidence against each mark's having been made in a separate workshop are the simple decorations or symbols which are to be found on the bases of a small proportion of them.<sup>82</sup> Such additional marks appear on 13 per cent of the signed Firmalampen of Aquileia (N = 1,337), to take one example. Most of the marks consist of dots or groups of dots, which might be regarded as not very distinctive. However some of these additional marks consist of a highly stylized and distinctive crown or crown-and-palm-branch; and there are also a few uniform leaf decorations. The interesting fact about them is that they appear on lamps of several different 'firms'. Crown-and-palm-branch marks, for instance, are found especially on 'Fortis' and 'Octavi' lamps, but also on Aquileian lamps of ten other 'firms'.<sup>83</sup> The emblems in question can hardly have been employed by many different manufacturers—they are too distinctive and uniform for that. Surely the moulds for these lamps must all have been made by the same potter or in the same workshop. The same emblems are also known on Firmalampen bases from other sites in Northern Italy and elsewhere: there are crown-and-palm-branch lamps from Novaesium, Argyruntum, various Pannonian cities, and Apulum, to take some widely scattered examples.<sup>84</sup> But the crown-and-palm-branch motif does not appear in random association with 'firm'-names: not only is it especially common on 'Fortis' and 'Octavi' lamps, it appears on 'Cassi', 'Luci/Lucius', 'Neri' and other lamps at more sites than one. A detailed investigation of the phenomenon—not really possible with the published evidence alone—might be worthwhile. The most likely explanation seems to be that for a time the 'Fortis' and 'Octavi' concerns, or a single 'Fortis' workshop and a single 'Octavi' workshop, collaborated. For a period some other 'firms', mostly very small, were involved. This collaboration took place in northern Italy, but it resulted in some exports and the export of some moulds (at least to Pannonia). Such collaboration between workshops is readily understandable, and something similar is known to have taken place among the *terra sigillata* potters of Lezoux.<sup>85</sup> It would certainly be a mistake to infer from these decorative marks that Fortis and Octavi were not, most of the time, separate concerns. Of the 342 'Fortis' lamps known from Aquileia, only twenty-seven (8 per cent) exhibit varieties of the crown or crown-and-palm-branch motifs.

Also problematical are the decorative elements to be found in the bowls of some Firmalampen. They appear in about 10 per cent of the Aquileian lamps.<sup>86</sup> But since these decorations are rather more varied, and yet individually, in most cases, not very distinctive, it is difficult to suppose that they denote the manufacturer in any way.

However most scholars suppose the great majority of the locally produced signed lamps were *unauthorized* copies produced by independent manufacturers, who, benefiting from the lack of protection for trade-marks,<sup>87</sup> by one means or another imitated the design of lamps which had originally been made by the workshops of Cresces, Fortis, Vibianus and so on. The simplest technique would have been to make a 'secondary' mould directly from the lamp one wished to imitate. It is suggested that the potters who made the imitations used lamps, and moulds and models of lamps, without any regard for the marks; in fact it is now almost an article of faith in some quarters that the names on Firmalampen tell us nothing about the proprietors of the workshops where the lamps were actually made.<sup>88</sup> 'Die Töpferstempel bezeichnen meist nicht die Fabrikanten.'<sup>89</sup>

<sup>82</sup> Buchi, xxxvi.

<sup>83</sup> See Buchi, chart 2. The marks are 'Cassi', 'Donatus/Donati', 'Favor/Faor', 'T. Gelli', 'Lucius/Luci', 'Neri', 'Paulini', 'Sextus/Sexti', 'Vetti' and 'Victor'.

<sup>84</sup> Novaesium: Vegas, 120 (Fortis); she was probably right to judge this a north Italian export. Argyruntum: M. Abramic-A. Colnago, *ŸŸAI* xii (1909), Beibl. col. 74 (2 Fortis). Pannonia: Iványi, nos. 1329-31, 2015-16 (Fortis), 1533-4 (Aprio), 1587, 1589 (Cassi), 2409 (Iegidi), 2516 (Lucius), 2607-10, 3884-5 (Octavi), 3911 ((Sa)turnini), 3958 (Vettii, written 'Vetlii'). Apulum: Băluță's article (1961: see n. 4) is haphazard on this matter, but the emblem seems to be visible in pl. II/9 (Cassi), VIII/2

(Neri), VIII/7 (Octavi).

<sup>85</sup> See H. Vertet, A. and J. Lasfergues, 'Remarques sur les filiales des ateliers de la Vallée du Po à Lyon et dans la Vallée de l'Allier', in *I problemi della ceramica romana di Ravenna, della Valle padana e dell'alto Adriatico, Atti del Convegno internazionale, Ravenna . . . 1969* (1972), 275, 277.

<sup>86</sup> See Buchi, 221-4. Most of these decorations consist of theatre masks or other busts. Buchi records twenty-six types at Aquileia.

<sup>87</sup> Frank, loc. cit. (n. 46).

<sup>88</sup> cf. Leibundgut, 75; Provoost, op. cit. (n. 9), 560-1.

<sup>89</sup> Loeschcke, *LV* 261.

But the positive arguments in favour of this position are decidedly shaky. The fact that locally-made Firmalampen are sometimes imperfect copies, with mis-spelled names for example, does not show that the lamps in question were unauthorized.<sup>90</sup> Firmalampen potters who mis-spelled names (which was quite a rare occurrence) or wrote them with variant ligatures showed in fact that they were not using the simplest copying technique; on the contrary, such a workman showed that he had a specific motive for putting a particular name, say 'Vibiani', on his lamp, and the motive was probably, in most cases, simply that he was working for the Vibianus concern.

Several considerations tell against the likelihood that a large proportion of signed lamps were unauthorized imitations. In the first place, lamps made from secondary moulds which were themselves in turn made from lamps ought, as has already been mentioned, to be smaller than the original lamps, and further descendants ought to shrink progressively in size. This does seem to have happened to some extent in some outlying areas, but in the total of surviving Firmalampen it is a rare phenomenon. It is in any case possible that the technique envisaged was used not only by unauthorized imitators but in the branch workshops.

The initial spread of the makers' marks also requires attention here. How did Firmalampen come to be present in so many areas in the first place? Why did the marks of category IV spread across the Mediterranean? Three processes can be distinguished. In some cases entrepreneurs transported lamps to places where demand was growing and competent potters were not available. This, however, conspicuously fails to explain the arrival of signed lamps in rather advanced areas such as Baetica, Narbonensis, Italy, Sicily and Africa Proconsularis. By the time Firmalampen began to spread very widely, terracotta lamps can hardly have seemed ingenious novelties in any except the most primitive parts of the western empire.

Secondly, some of the diffusion must have been owed to legionary soldiers,<sup>91</sup> who were in the first century the most numerous migrants from Italy and the advanced provinces to frontier regions. At Vindonissa in the Flavian period the legionary camp was occupied by XI Claudia, the majority of whose recruits came from northern Italy.<sup>92</sup> These legionaries probably brought some Italian lamps with them, and probably purchased some more after they arrived from traders attracted by the massed buying power which a legion represented.<sup>93</sup> A similar case might be the XIII Gemina in Dacia. When the province was new, it was stationed at Apulum, the origin of a high proportion of the Firmalampen found in Dacia.<sup>94</sup> Before Trajan's Dacian wars it had been stationed in Pannonia, where Firmalampen were by then common possessions. But the role of soldiers' migrations in the diffusion of signed lamps must not be exaggerated: XI Claudia was an exceptionally Italian legion at the crucial period, and the movements of soldiers do very little to explain either the diffusion of signed lamps in areas such as Narbonensis where no legions were stationed or indeed any of the diffusion of marks in category IV.

The third process we need to consider is the establishment and functioning of branch workshops. Their role in the lamp industry has not previously been discussed in any detail. According to Balil, the existence of such branches 'sólo se documenta hoy adecuadamente en el área danubiana singularmente en su sector nórico-panónico'.<sup>95</sup> The documentation alluded to presumably consists of the surviving moulds of Firmalampen, most of which, as already noted, come from Pannonia. But this fact is not very significant for the existence of true branch workshops, since such moulds scarcely exist in northern Italy itself, and the Pannonian ones *might* in fact have belonged to unauthorized imitators.

Branches set up by substantial lamp-making firms would normally be operated by skilled potters, who might bring moulds with them but would be capable of making new ones, and hence would have no strong propensity to turn out undersized lamps. Such

<sup>90</sup> As suggested by S. Panciera, *Vita economica di Aquileia* (1957), 40.

<sup>91</sup> This factor has recently been emphasized by Leibundgut.

<sup>92</sup> G. Forni, *Il reclutamento delle legioni da Augusto a Diocleziano* (1953), 229-30. The legion arrived there in 70, having previously served in Dalmatia. It was preceded at Vindonissa (since early in Claudius'

reign) by XXI Rapax, which also drew some recruits from Italy (but in what proportion is scarcely known; cf. Forni, 234).

<sup>93</sup> On this aspect of legionary encampments cf. J. J. Wilkes, *Dalmatia* (1969), 217.

<sup>94</sup> See Baluța's articles (n. 4).

<sup>95</sup> Balil, 'Marcas', 159, n. 5.

pottery could be sent wherever a market came into being, and hence they can account for the known patterns of distribution. One type of market would be any legionary encampment, and ample evidence is available that various legions and their camp-followers bought enough to keep skilled potters in business.<sup>96</sup>

Some Firmalampen signatures, particularly of large firms such as Fortis and Strobilus, occasionally include single letters below the firm name. Thus we meet 'Fortis/I', 'Fortis/N', 'Fortis/A', and at least four other letters used in the same way.<sup>97</sup> The Gallic firm 'L. Hos. Cri.', mentioned earlier, was particularly prone to the use of such letters. They certainly look like self-identifying signs added by branches; but outside the 'L. Hos. Cri.' firm these lamps are relatively few, and any interpretation of them is much too uncertain to be of any use.

It is highly significant that the firm of Strobilus, which originated beyond reasonable doubt in Northern Italy, had what appears to have been a branch workshop at Lugdunum, which produced both lamps and other kinds of pottery; at least all the lamps found on the site were 'Strobili' lamps.<sup>98</sup>

But what is of crucial importance is the fact that Roman society and law provided the framework on which a system of branch workshops could be built. Archaeological discussions of the lamp industry have neglected the non-archaeological evidence concerning the behaviour of Roman artisans and businessmen.<sup>99</sup> In reality it was common practice to set up branch businesses, mainly under the management of slaves or freedmen. The well-to-do habitually lent money to freedmen—generally their own freedmen of course—for the latter to use in commercial enterprises.<sup>100</sup> For this the investor had to feel great confidence in the freedman's ability and integrity. A less risky mechanism, though it required more supervision, was to appoint *institores*.

An *institor* was essentially a manager or agent who ran an enterprise which remained the property of the principal. 'Institor est qui tabernae locove ad emendum vendendumve praepositur quique sine loco ad eundem actum praepositur' wrote the jurist Paulus.<sup>101</sup> Such a manager or agent could be one of the principal's own slaves, or a slave belonging to someone else, or a free man.<sup>102</sup> Legal writers seem to have broadened the word somewhat: 'cuicumque igitur negotio praepositus sit, institor recte appellabitur', Ulpian is quoted as writing with a long list of examples.<sup>103</sup> In ordinary speech the commonest use of the word was probably for the manager of a *taberna*,<sup>104</sup> but the latter term was itself wide enough to include shops of many kinds (the temptation to give the word its modern Greek or Italian meaning should be resisted).

What matters most is not really the usage of the word *institor* but the prevalence of certain commercial customs and legal rules. However books on Roman economic life,

<sup>96</sup> See M. Vegas, *Cerámica común romana del Mediterráneo occidental* (1973), 157, n. 378. F. Fremersdorf, *Römische Bildlampen* (1922), 78, catalogued the lamps and then ceramics then known with inscriptions referring to legions. Cf. also C. von Bülow, 'Militärische und Zivile Keramikproduktion in den römischen Provinzen am Rhein und an der oberen Donau', *Klio* LVII (1975), 233-40 (on *terra sigillata*).

<sup>97</sup> Buchi, 65.

<sup>98</sup> Unfortunately the number of lamps is not specified by Bailly (n. 11), 118, and A. Comarmond, *Description des antiquités . . . du Palais-des-Arts de la ville de Lyon* (Lyon, 1855-7), 92-7, which seems to have been his ultimate source, leaves it ambiguous between one and a whole group. What may have been a workshop of 'C. Oppi Res.' at Emerita is described by V. Barrantes, *Barros Emeritenses* (Madrid, 1877), 16-34.

<sup>99</sup> With the exception of the interesting discussion by A. Carandini, 'Produzione agricola e produzione ceramica nell'Africa di età imperiale', *Omaggio a Ranuccio Bianchi Bandinelli—Seminario di Archeologia e Storia dell'Arte Greca e Romana dell'Università di Roma. Studi Miscellanei* 15 (1970), esp. 116-19.

<sup>100</sup> The classic text is Petron., *Sat.* 76, where Trimalchio, now a landed proprietor, is made to say,

'sustuli me de negotiatione et coepi libertos faenerare'. P. Veyne, 'Vie de Trimalcion', *Annales ESC* 1961, 239, supplies the context, pointing out the frequency with which the fortunes of the élite are described as consisting of lands and 'nomina debitorum'. Also relevant is the *actio de in rem verso* (dealt with in *Dig.* xv. 3), which was based in part on the fact that slaves and freedmen independently made profits for their masters.

<sup>101</sup> Paulus, *Dig.* xiv. 3. 18; cf. Gaius, *Inst.* iv. 71. There is always someone 'qui institorem praeposuit' (Ulpian, *Dig.* xiv. 3. 1; cf. 3. 5. 11, etc.), sometimes referred to as the *dominus* (e.g. xiv. 3. 5. 15).

<sup>102</sup> Ulpian, *Dig.* xiv. 3. 1, Gaius, loc. cit. The *institor* may be itinerant (Paulus in *Dig.* xiv. 3. 4 and 18), but evidently this is not the common situation (Ulpian in *Dig.* xiv. 3. 5).

<sup>103</sup> *Dig.* xiv. 3. 5. pr.

<sup>104</sup> Ulpian in *Dig.* xiv. 3. 3; cf. Gaius, loc. cit. ('quia qui tabernae . . .'). *OLD* misleadingly translates 'a small retailer, a shopkeeper, pedlar, or sim.'. The technical meaning is clear from the legal writers, and from it arose the contemptuous use of the word to refer to shopkeepers. A number of texts cannot be fully understood unless the technical meaning of *institor* is borne in mind: e.g. Cic., *Phil.* II. 97, Val. Max. vi. 1. 6.

with the exception of Štaerman and Trofimova's,<sup>105</sup> have paid less attention to *institores* than they should have done. The chapter of the *Digest* which is devoted to the *institoria actio* (for obvious reasons the relationship of owner to *institor* gave rise to extensive legal complications),<sup>106</sup> incidentally makes it clear that the institution was very widespread. The lack of explicit evidence for *institores* in ceramics production is of no significance: most of the legal texts deal either with *institores* in general, or with those whose classification as *institores* might be unclear. They are explicitly attested in other kinds of production.<sup>107</sup> Moreover it is certain that *institores* could be set up in places far removed from the principal's home base. As a matter of course a principal probably resident in Italy could have an *institor* at Arelate,<sup>108</sup> and a provincial principal could have an *institor* in the capital.<sup>109</sup> A branch business in the hands of an *institor*, unlike one which actually belonged to a freedman, had the advantage (from the proprietor's point of view) that it did not pass by stages out of the owner's hands with the progressive stages of economic emancipation that followed after manumission.<sup>110</sup> Finally it is worth observing that the institution was already—so it seems—well known by the time of the late republican jurist Ser. Sulpicius Rufus.<sup>111</sup>

To some extent a parallel arrangement is visible in the *terra sigillata* industry. The discovery that the Ateius workshop of Lyon had what must have been a 'parent' workshop at Arretium<sup>112</sup> suggests that the former may originally have been operated as a branch;<sup>113</sup> and Oxé long ago argued that several branches of Arretine workshops were set up in Gaul and Germany in the first two decades A.D.<sup>114</sup> But it will readily be admitted that we still have much to learn about the organization of *terra sigillata* production.<sup>115</sup>

It is evident that Firmalampen were made according to simplified and standardized designs to meet the needs of quick production and semi-skilled labour. This simplification and standardization favoured the setting up of branch workshops far away from the supervision of the master craftsman. The *institores* themselves will presumably have been skilled men, but in the more backward provinces at least they probably had difficulty in obtaining suitable slaves for skilled work. For a Firmalampe this was scarcely necessary.

The localization and enumeration of branch firms requires much more work both on theory and on cataloguing than has taken place so far. But it is clear that if the view put forward in this article is broadly correct, the largest lamp firms, such as those which used the 'Cresces', 'Fortis', 'Strobili', 'Vibiani', and 'C. Oppi Res.' marks, had branches in considerable numbers. Fortis, to take the extreme instance, will have had more than one branch both in northern and in central Italy, in Gaul, in Germany and in Pannonia,<sup>116</sup> and probably branches in Dalmatia and Dacia. A total between twenty and thirty (not necessarily all active at once) would not be surprising. 'C. Oppi Res.' will have had at least

<sup>105</sup> E. M. Štaerman and M. K. Trofimova, *Rabovladel'cheskie otnoshenija v rannej rimskoj imperii. Italija* (1971), referred to here by the Italian translation *La schiavitù nell'Italia imperiale, I-III secolo* (1975). On *institores* see 76-80, as corrected by F. Serrao, *Studi Romani* xxv (1977), 238. See also Klingmüller in *RE* s.v., cols. 1564-5.

<sup>106</sup> The legal bibliography can be traced through A. Burdese, 'Actio ad exemplum institoriae' e categorie sociali', *Studi in memoria di Guido Donatuti* (1973) II, 191-210.

<sup>107</sup> cf. *Dig.* xxxii. 91. 2.

<sup>108</sup> Ulpian in *Dig.* xiv. 3. 13. pr.

<sup>109</sup> Ulpian in *Dig.* v. 1. 19. 3.

<sup>110</sup> On freedmen's wills see esp. S. Treggiari, *Roman Freedmen during the Late Republic* (1969), 78-80.

<sup>111</sup> cf. Ulpian in *Dig.* xiv. 3. 5. 1.

<sup>112</sup> G. Maetzke, 'Notizie sulla esplorazione dello scarico della fornace di Cn. Ateius in Arezzo', *Acta RCRF* II (1959), 25-7.

<sup>113</sup> H. Vertet, 'Céramique sigillée tibérienne à Lezoux', *Rev. arch.* 1967, at 286; M. Picon, etc., 'Recherches sur les céramiques d'Ateius trouvées en Gaule', *Acta RCRF* xiv-xv (1972-3), 128-35 (this article also gives information on a unpublished Ateius workshop at Pisa; the authors suggest (130-1)

that the Pisa and Lyon workshops were geared to make profits from specific markets, that at Pisa aiming at export by sea); M. and P. Vauthey, 'Les courants artistiques et économiques de l'industrie céramique dans l'antiquité . . .', *Rev. arch. du Centre* xii (1973), 121-2.

<sup>114</sup> A. Oxé, 'Die Halterner Sigillatafunde seit 1925', *Bodenaltertümer Westfalens* vi (1943), esp. 62-6; cf. *Arretinische Reliefkeramik vom Rhein* (1933) (*Materialien zur römisch-germanischen Keramik*, Heft 5), 36. This is largely accepted by H. Comfort, *EAA Supplemento* (1973) s.v. *terra sigillata*, 814-15. For a careful but inconclusive discussion of this problem with regard to another body of material see C. Bémont, *Recherches méthodologiques sur la céramique sigillée. Les vases estampillés de Glanum* (1976), 196-202.

<sup>115</sup> C. M. Wells has recently hypothesized that much of the distribution was in the hands of 'independent middlemen' who sometimes appear in inscriptions as *negotiatores artis cretariae* (*Acta RCRF* xvii/xviii (1977), 136).

<sup>116</sup> 'Fortis' moulds have been found on at least four sites in Pannonia (Iványi, 316). In Gaul, 'Surillus' moulds have been found both at Lezoux and at Vichy (Leibundgut, 77), sites only some twenty miles apart.



one branch in Gaul, one in Sardinia, at least one in Spain, at least one in the neighbourhood of Rome, and several in North Africa.

Many different factors combined to produce distribution of types III and IV. They can perhaps be distinguished most clearly in the case of those numerous marks of type III which are spread over very large areas without being overwhelmingly common on any particular site. 'Phoetaspi' can serve as an example (cf. Table 1), though it is not a perfectly typical one because the name appears on some lamps of non-Firmalampen type,<sup>117</sup> and because there seems to have been a branch in Egypt.<sup>118</sup> It is fairly typical, however, that the following non-Italian, non-Egyptian provenances are known for 'Phoetaspi' lamps: <sup>119</sup> Cazères (Haute-Garonne), Lectoure (Gers), Garrigues (Gard), Arelate, Arausio, Arausio or Vasio, Vienne (2), Lyon (3), Vichy, Cologne (2), Trier, Vindonissa (10), Salzburg, Sopron, Krk, Emona (5), Poetovio (2), Aenona (15), Salona. The inference is plausible that there was a branch workshop in the lower Rhone valley and at least one somewhere beyond the north-eastern frontier of Italy, as well as production in Italy itself.

Several points need to be made about this distribution. First of all, these lamps represent a minute percentage of the 'Phoetaspi' lamps that once existed. Aenona, Vindonissa and Aquileia (10) are the sites which have produced the largest numbers, but that may be insignificant. Some of the distribution could be explained as exportation, since it is so thin and found along known trade routes; there may also have been unauthorized imitation. The whole question of how long the Phoetaspi business remained active is, as with most other marks, still subject to investigation; perhaps not very long. It is likely that those who made lamps of any particular mark also made pottery of other kinds, and hence did not need to produce huge numbers of lamps in order to survive.<sup>120</sup> The same establishment on the 'Via di Nocera' at Pompeii evidently contained both an *osteria* and space for making and for selling terracotta lamps.<sup>121</sup>

Most important in this context is the likely role of itinerant sellers of lamps. 'In most peasant societies, markets are periodic rather than permanent and continuous . . . because the *per capita* demand for goods sold in the market is small, the market area is limited by primitive transport technology, and the aggregate demand is therefore insufficient to support permanent shops. Businessmen adjust by visiting several markets on a regular basis . . .'.<sup>122</sup> This is undoubtedly applicable to the less urbanized parts of the Roman Empire, and helps to account for the 'thin' distribution of many lamp-makers' signatures over so many minor sites.<sup>123</sup> Many provincials will have obtained their lamps, like Aladdin, from a travelling lamp- or pottery-merchant, who will however have visited their communities not from Italy but from some provincial centre near by.

Finally, it hardly needs repeating that signed lamps represent only part of the Roman world's terracotta lamp production, though a large part. Widespread diffusion of types suggests, however, that branch workshops may also have played an important part in the production of unsigned lamps.

<sup>117</sup> cf. Buchi, 134.

<sup>118</sup> I have not attempted to collect the evidence for 'Phoetaspi' lamps from Egypt, but two in the British Museum (Walters (n. 11), no. 613, and another referred to by Bailey, II, 276), one in the Ashmolean (Bailey, II, 277), one in the Hermitage (O. Waldhauer, *Kaiserliche Hermitage. Die Antiken Tonlampen* (1914), no. 176) and two in Berlin (Heres (n. 4), nos. 110, 228) have this provenance.

<sup>119</sup> Most of this information is derived from Buchi, 135. The Spanish origin of the lamp(s) mentioned by F. Alvarez-Ossorio, *Arch. Esp. de Arq.* xv (1942), 278, appears uncertain.

<sup>120</sup> On the 'Hilario' workshop at Bononia see Gualandi Genito (n. 36). Similarly with the 'M. Nov. Ius.' workshop at Hadrumetum (see n. 41). The box which contained most of the 'Strobili' lamps found at Pompeii (twenty-four of them) contained thirteen other Firmalampen, together with ninety bowls (D. Atkinson, *JRS* iv (1914), 27) with a number of different makers' stamps. All the lamps

seem to have been unused, so presumably all these wares had been assembled for sale. Buchi lists references to surviving pieces of *terra sigillata* which show names well known in lamp-manufacturing, such as Atimetus, Fortis and Iegidius (II, 70, 108).

<sup>121</sup> G. Cerulli Irelli, 'Una officina di lucerne fittili a Pompei', in A. Carandini (ed.), *L'Instrumentum* (see n. 13), 53-72. The complete absence of signatures from the sixty-one lamps found is of interest.

<sup>122</sup> B. J. L. Berry, *Geography of Market Centers and Retail Distribution* (1967), 93.

<sup>123</sup> On periodical markets see R. MacMullen, 'Market-Days in the Roman Empire', *Phoenix* xxiv (1970), 333-41 (with interesting provincial evidence); E. Gabba, 'Mercati e fiere nell'Italia Romana', *SCO* xxiv (1975), 141-63 (it is curious that the famous fair at the Campi Marci near Mutina seems to have declined a few years before the major production of Firmalampen in that area began; cf. Gabba, 157).

## V. CHRONOLOGY

Of the tens of thousands of known signed lamps very few come from narrowly datable archaeological contexts. In this section I aim to identify the extreme chronological limits of signed-lamp production, distinguishing between categories III and IV (see above, p. 129) but not between individual firms. And I shall not make any concerted attempt—it would be premature—to trace in detail the geographical development of the lamp industry.

Certain workshops were already turning out signed lamps in Augustus' time: 'C. Vibi/Tibur' lamps and the workshop of Hilario at Bononia have already been mentioned. Recently some have also attempted to push the beginning of Firmalampen production back to the same period. The traditional reference point for this event has been Pompeii, where Firmalampen appear in relatively restricted numbers.<sup>124</sup> Hence they have been thought to be a novelty of the 70s. But the argument is fallacious, since Firmalampen never came to be dominant in southern Campania, and the proportion of Firmalampen on the two sites overwhelmed in 79 is perfectly consistent with a beginning for Firmalampen production many decades earlier.

But an Augustan or Tiberian date is probably too early. Buchi has argued in detail that Firmalampen were made from the beginning of the first century, on the grounds that a number have been found in association with, usually in fact in the same tomb as, Augustan or Tiberian (as well as Caligulan or Claudian) coins.<sup>125</sup> Some twelve instances are cited for Augustus alone. The argument is illusory, however, since coins only give a tomb a *terminus post quem* and Roman imperial coins often stayed in circulation for periods which in modern society (with efficient central banks) would be impossible. This is nicely illustrated, for example, by those four tombs in the recently published northern cemetery of Emona (Ljubljana) which contain more than one coin. A coin of Vespasian was in circulation at least as late as the reign of Carus, another at least as late as Septimius Severus; a coin of Nerva lasted at least until Constantine.<sup>126</sup>

Against an early date it is usual to cite the absence of Firmalampen from the pre-Vespasianic strata of Hofheim, but this does not show decisively that production had not started in Italy or some other areas. In fact the most important site is the Magdalensberg, to which a closing date in the last years of Claudius' reign is normally assigned.<sup>127</sup> Some Firmalampen have been discovered there, but in some cases (three out of nine) they are more ornate than the later standardized Firmalampen, and no single example has a firm-name on the base.<sup>128</sup> Given the proximity of the Magdalensberg to Italy and the quantity of material found there, this suggests that the firms which later became well known only started production at the earliest a few years before 50. They will have spread early to sites in Italy and probably to Emona, Poetovio, Lugdunum and Baeterrae (Béziers), the only places where they are attested in association with coins minted before 37. We can most plausibly imagine this happening in the 50s and 60s. But no doubt the process of capturing the provincial markets continued throughout the last third of the first century and beyond.

The end of Firmalampen production is also hard to date. A pottery workshop which produced Firmalampen at Aquincum may apparently still have been in operation under Gordian III,<sup>129</sup> and a few well-dated specimens from Lauriacum belong to the period 230/5–270.<sup>130</sup> According to Buchi they went on being produced until the late third or even the fourth century.<sup>131</sup> However the evidence for post-Severan production is not extensive. There was undoubtedly some, and a few lamps can be cited from contexts containing coins of the tetrarchs, of Constantine and even of Magnentius, Constantius II

<sup>124</sup> Of the more than 5,000 lamps at Naples (largely from Pompeii and Herculaneum), 274 are Firmalampen (C. Pavolini, 'Le lucerne fittili del Museo Nazionale di Napoli', in Carandini (ed.), *L'instrumentum* (see n. 13), 38; the author believes it is easy to tell the local products from the imports from the valle Padana, but he does not establish the point).

<sup>125</sup> Buchi, xxix–xxxiii. His opinion is reported incorrectly by Bailey, II, 274.

<sup>126</sup> Single burials are involved in each case. See L. Plesničar-Gec, *Severno Emonsko Grobišče. The Northern Necropolis of Emona* (1972), tomb nos. 187, 274 and 225, for the evidence in question.

<sup>127</sup> cf. now Leibundgut, 43.

<sup>128</sup> Farka (n. 4), 78–86.

<sup>129</sup> Szentléleky (n. 65), 181.

<sup>130</sup> Deringer, nos. 18, 22 (cf. 21), 23, 126, 245, 265, plus some other anonymous examples.

<sup>131</sup> Buchi, xxxii.

and Valens.<sup>132</sup> A full discussion, taking into account regional developments, would require more information than is available in print. But it is clear that the only major firm which may have continued production into the first years of the fourth century is that of Cresces; <sup>133</sup> if it did so it was probably at Emona.

Lamps in category IV are totally absent from Pompeii and Herculaneum and can only have come into serious production after 79. A recent discussion concluded that all the earliest datable finds of 'tria nomina' lamps (i.e. lamps of this category) belonged to the early second century.<sup>134</sup> At the other end of the scale, the standard view seems to be that the activities of most of the category IV producers concluded before the end of the second century, with a few ('L. Cae. Sae.', 'C. Iun. Bit.') active in the third century.<sup>135</sup> The production of relatively large firms disappeared at some date placed vaguely in the mid-third century, with the marks of the late third and fourth centuries enjoying only local circulation.<sup>136</sup>

## VI. CONCLUSIONS

Some names of makers of terracotta lamps had an enormously wide diffusion in the first to third centuries. In particular two major groups of names can be distinguished, one (designated III in the above discussion) which originated in Northern Italy and had a primarily 'northern' diffusion; the other (designated IV) which may have originated in central Italy but more probably in North Africa, with a 'southern' diffusion. The two groups overlap mainly in the German provinces, in Narbonensis and in the vicinity of Rome.

Long-distance trade in terracotta lamps is unlikely to have taken place on a significant scale, except for short periods when they were a novelty in any given area. Transport costs, especially the costs of land transport, were too high for this to be a rational form of economic behaviour, except in unusual circumstances. Most of the signed lamps found in areas away from the original places of manufacture were in fact made locally.

Some of these locally produced lamps were no doubt unauthorized copies; but the arguments for explaining the majority of them in this way are weak. A major part of the diffusion is rather to be explained by the use of a Roman institution well adapted to lamp production—the *institor* or manager of a branch enterprise. The larger 'firms' are likely to have created a number of such branch workshops at strategic places far away from their original sites.

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## BIBLIOGRAPHICAL APPENDIX

Other significant recent publications of lamps include: T. Oziol, *Salamine de Chypre* VII. *Les lampes du Musée de Chypre* (1977), esp. 73–218; C. Iconomu, *Opaițe greco-romane* [Muzeul Regional de Arheologie Dobrogea] (Bucharest, 1967); M. Beltrán Lloris, 'Lucernas romanas del Museo Arqueológico de Zaragoza', *Caesaraugusta* xxvii–xxviii (1966), 77–88; A. Moutinho Alarcão and S. Da Ponte, in J. Alarcão-R. Etienne (series editors), *Fouilles de Conimbriga* VI (1976), 93–114; V. Righini, 'Le lucerne ellenistiche e romane di Faenza e del territorio faentino', *Studi faentini* . . . Giuseppe Rossini (1966), 165–90; M. Polia, in *Ostia* I, *Le Terme del Nuotatore*, *Scavo dell'ambiente* IV = *Seminario di Archeologia e Storia dell'Arte Greca e Romana dell'Università di Roma*. *Studi Miscellanei* XIII (1968), 81–5; C. Salone, in *Ostia* III . . . = *Studi Miscellanei* XXI

<sup>132</sup> In S. Petru, *Emonske Nekropole (odkrite med leti 1635–1960)* (1972), tombs 671, 513 and 1543 have coins of these last three emperors, as well as a 'Cresces', a 'Fortis' and another 'Cresces' lamp respectively. The 'Cresces' lamp Deringer no. 178 is dated by him after 375. His dating of isolated examples (nos. 279 ('Comuni'), 280 (anon.)) to the fifth or sixth centuries should be regarded sceptically.

<sup>133</sup> See the references given by Buchi, 34. Add Plesničar-Gec, op. cit. (n. 126), tomb 115.

<sup>134</sup> Leibundgut, 31–3, 40–1, referring (not with complete precision) to finds at Ampurias (though in fact the lamp fragments in question belong to

Level II, dated to A.D. 130–200: see M. Almagro-N. Lamboglia, *Ampurias* XXI (1959), 10, 24), Ostia (in a level of the Trajanic-Hadrianic period according to Salone (see Bibl. Appdx), 397), Libarna (where such lamps were found with lamps of Loeschcke type X, usually dated after A.D. 100: M. Guasco, *NSA* 1952, 218–19, but much is indefinite here), and Tipasa (a less valuable indication: the Hadrianic coin found on this lamp may have been far from new) (S. Lancel, *Bull. d'arch. alg.* I (1962–5), 61).

<sup>135</sup> cf. Bailey (n. 48), 24.

<sup>136</sup> cf. Joly, 98.

(1973), 395-404; R. Hanoune, 'Lampes de Graviscae', *MEFR* LXXXII (1970), 237-62 (with references to other minor contributions on Italian lamps); A. Ferraresi, 'Le lucerne del Museo Civico "Antonio Parazzi" di Viadana', *Contributi dell'Istituto di archeologia* IV (1973) (*Pubblicazioni della Università Cattolica del Sacro Cuore*), 31-131; C. Delplace and others, *Ordonia* IV (1974); L. Mercado, *Lucerne greche e romane dell'Antiquarium comunale* (1962), and 'Portorecanati (Macerata) . . .', *Not. Sc.* 1974, 142-430; on Pompeii see the article of G. Cerulli Irelli cited in n. 121; the find of some 4,000 lamps—most of them used—in an underwater site at Pozzuoli mentioned by A. de Franciscis in *FA* XXII (1967), no. 4603; and S. De Caro, op. cit. (n. 26), 134, has not yet been published.