

THE TRADE AND PRODUCTION OF GARUM AND ITS  
ROLE IN THE PROVINCIAL ECONOMY OF HISPANIA  
TARRACONENSIS

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Fish has formed an important component of mans' diet since the Neolithic and considerable emphasis was placed upon the acquisition of fresh fish by the Roman aristocracy. However the increased demands created by the establishment of urbanism in the Phoenician colonies of S. Spain in the Eighth Century BC necessitated the adoption of preservative methods, namely the use of salt.

Salted fish and fish sauces seem to have been a ubiquitous feature of the ancient diet being traded by the Phoenicians but becoming particularly important following the Greek penetration of the Peninsula in the Sixth Century BC. Production centred in Andalucia and seems to have survived the Roman conquest.

Increased investment by Italian aristocrats led to the creation of Romanised villae in Cataluna which by the mid First Century BC engaged in the production of wine. By the Augustan period, however, Tarraconensian exports increased with the opening up of the annona militaris and the city of Rome. Although wine was the principal recipient, fish sauce seems to have been carried as a secondary commodity.

The interrelationship between fish sauce and other produce is seen also in its inclusion within the villa economy. Production seems to have occurred on a sufficient scale to be termed 'industrial' and to judge by the names of producers and merchants attested on amphorae attracted considerable wealth, many of those involved also producing wine.

The breakdown of the relationship between town and country and the gradual movement of wealth away from the region meant that the province's commercial interests contracted and although the production of fish sauce continued until the Seventh Century AD it served only to satisfy local demand.

## DECLARATION OF AUTHORSHIP

I, the undersigned, hereby declare this thesis to be the work of the author, and the author alone unless otherwise attributed.

28 June 1997

Date

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# INTRODUCTION

Recent years have seen the ancient economy become one of the most debated aspects of antiquity: although production and consumption cannot be disputed the interconnection of these, and thus the relative importance of trade is open to considerable differences of interpretation. The rise of sociological studies of the ancient world led historians such as Michael Rostovtzeff and Tenney Frank<sup>1</sup> to look at the economy of the Roman Empire by the application of current economic forms - banking, investment and so forth - to the ancient economy. Rostovtzeff believed that the Empire was united into a single 'world market' that was held together by the existence of a large scale trade in manufactured goods. Such led to the imposition upon the Graeco-Roman world of substantial economic policies dictated by balance sheets, freedom of trade and market distributions on a scale far beyond that possible during the timeframe concerned.

This interpretation was overturned by Moses Finley's seminal work The Ancient Economy the premise of which essentially lay with the fact that the ancients had no modern concept of the economy; rather it was viewed as what is best described as a common sense approach to the activities of the 'gentleman landowner'.<sup>2</sup> Finley's views have formed the basis of much later research with Keith Hopkins proposing the qualification that economic growth did exist in antiquity and proclaiming Finley's 'primitivist' view as the *new orthodoxy* of ancient economic interpretation.<sup>3</sup> Although Finley's contention that the Roman economy was essentially agricultural is now largely uncontested, the scale of this agricultural activity is more debatable.

Finley has argued that the *widespread prevalence of household self-sufficiency in necessities was enough to put a brake on extensive production for export*,<sup>4</sup> by which

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<sup>1</sup> cf Rostovtzeff, M (1957) The Social and Economic History of the Roman Empire (Oxford); Frank, T (1959) An Economic Survey of Ancient Rome (Baltimore).

<sup>2</sup> cf Finley, M I (1973) The Ancient Economy (London) p 19-20.

<sup>3</sup> cf Hopkins, K (1983), introduction to Garnsey, P D A, Hopkins, K and Whittaker, C R (eds.) Trade in the Ancient Economy (Berkeley) p ix-xxv.

<sup>4</sup> cf Finley, M I (1973) op. cit. n. 2 p 138.

all commercial transactions were confined to a purely local function with little or no wider movement of goods. Central to this thesis is the growth of large scale landholdings geared almost exclusively to self-sufficiency with any export trade being limited by the lack of technological advancement, the two year fallow cycle and the high costs of land transport.<sup>5</sup> Although the creation of an agricultural surplus did enable the growth of urban centres these remained essentially parasitic, their economic well-being based not upon the development of manufacturing industries but on the exploitation of their agricultural hinterland. Only in large urban centres could any degree of specialization be achieved.<sup>6</sup> Although some centres such as Arretium clearly were able to export commodities, the individuals involved seem to have remained on a small scale being culled from the lowest echelons of Roman society; the wealthy being concerned only in investing their fortunes in land: *there were three places for wealth, in land, out on short-term interest-bearing loans, or in a strong box.*<sup>7</sup> Despite admitting that *anyone who confuses the gentlemanliness of agriculture with a disinterest in profits and wealth closes the door to an understanding of much of the past,*<sup>8</sup> Finley's own blithe disregard for much of the essential archaeological evidence for economic transactions in antiquity must render his rejection of all forms of large-scale economic activity somewhat suspect. Quite clearly goods were shipped across the Roman Empire in increasing quantities as a consequence of developments in technology, related social institutions, increased taxation<sup>9</sup> and the establishment of the *Pax Romana*.

Thus although the initial premise of the essentially agrarian and self-sufficient nature of the Roman villa economy is a valid one, there appears to have been a greater degree of commercial interaction included within this than the 'primitivist' model allows for. As shall become apparent through this thesis, it is the author's belief that despite stipulations to the contrary aristocrats, as well as freedmen and other lower classes, did engage in trade and were able to garner a considerable profit thereby. Whether inspired by purely economic or social motivations, long distance trade clearly

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<sup>5</sup> cf Finley, M I (1973) op. cit. n. 2 p 108.

<sup>6</sup> cf Finley, M I (1973) op. cit. n. 2 p 135; Xenophon *Cyropaedia* 8.2.5.

<sup>7</sup> cf Finley, M I (1973) op. cit. n. 2 p 116.

<sup>8</sup> cf Finley, M I (1973) op. cit. n. 2 p 58.

<sup>9</sup> cf Hopkins, K (1983) op. cit. n. 3 p xv.

did exist and Petronius' Trimalchio may not have been exceptional in the scale of profits that could be accrued.

Although the economic structures of the Roman Empire do appear to have remained within the aspect of villa based production, being primarily geared towards the satisfaction the demands of self-sufficiency, they appear to have covered a wide range of activities from purely localised production to larger scale 'industrial' operations such as the manufacture of olive oil in the Guadalquivir valley which seems to have seen the involvement of senatorial *gentes* such as the Fabii Cilones. This profitability and scale is not confined to the Baetican oil industry and it is possible to discern trends in production and investment throughout the provinces of the Western Mediterranean with the very existence of *societates* implying a degree of organisation and profitability.<sup>10</sup> The economic dictates expressed by Varro and Cato appear to have presupposed that villa owners will have engaged in the production of goods for a surplus, however, it is also possible to envisage a more explicitly 'industrial' form of production, as may in fact be seen in the case of fish sauce production in the Bay of Cadiz.

It has been only comparatively recently that the manufacture of fish sauce has come to be recognised as an important aspect of the ancient economy<sup>11</sup>, however, few studies have as yet attempted to view it as part of the wider economic structure of the Roman empire. By examining the patterns of production and exchange found in this commodity and by relating these to comparable evidence for other forms of manufacture in the same region one can acquire a greater understanding of the mechanisms of the villa economy and to establish the scale and profitability of such activities. It is only by recourse to the archaeological evidence that the theoretical disputes within the models established by both 'modernists' and 'primitivists' can be resolved. Tarraconensis, free from the emphasis attached to the economies of Baetica and Africa, has often been disregarded in this and it worth relating that any study of the manufacture of fish sauce has had a tendency to ignore the scale of this activity within

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<sup>10</sup> cf Hopkins, K (1983) op. cit. n. 3 p xviii.

<sup>11</sup> This is not the place to recount the entire bibliography, suffice to note the publication of Ponsich, M and Tarradell, M (1965) Garum et industries antiquae de salaison dans la Méditerranée occidentale (Paris) as the earliest treatment of the subject.

Tarraconensis in favour of better known sites along the Straits of Gibraltar.<sup>12</sup> However, recent years have seen a greater recognition of the wider extent of this industry into NE Spain and Gaul as well as within the Italian Peninsula.<sup>13</sup> Such production seems to have been related to that of wine and other commerce from the region in being undertaken by local landed aristocrats and freedmen who on occasion could have become involved in the exchange of the commodities concerned. Although the pursuit of autarchy was considered for all forms of estate production and was particularly prevalent in Eastern Tarraconensis, the provision of natural resources, labour and capital for investment will have led to a concentration of production into a smaller number of central sites both within estates but also as independent 'industrial' units. Fish sauce production seems to have been particularly significant in this regard, with the distribution of settlement implying that these factories were not merely marginal to the villa economy but were operated in their own right throughout the year with the production of other varieties of salted meat and purple dye during the fallow months.

Fish sauce production, therefore, seems to have been an important and profitable part of the ancient economy with important sources of investment both by individuals and by commercial *societates*. Although it accords with the essentially primitive villa production as envisaged by Finley more allowance must be made for the variations in scale than the 'primitivist' picture of the ancient economy allows for. Unfortunately ancient literary quantifications are notoriously unreliable making any such interpretation unsound, however, something of a remedy to this can be achieved by recourse to the evidence of amphorae and other ceramic goods. The distribution of these wares, even where quantified data is lacking, can provide at least an indication of the extent of the market achieved by these goods, however, as vessels used in (in the case of amphorae) or dependent upon (in the case of fine wares) long distance trade,

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<sup>12</sup> cf Ponsich, M (1988) Aceite de Oliva y Salazones de Pescado: Factores Geo-Economicos de Bética y Tingitania (Madrid); Curtis, R I (1991) Garum and Salsamenta: Production and Commerce in Materia Medica (Leiden).

<sup>13</sup> cf Fernández Ochoa, C (1994) Una Industria de salazones de Epoca Romana en la Plaza del Marques Excavaciones Arqueologicas en la Ciudad de Gijon (Gijon); Sanquer, R and Galliou, P (1972) "Garum, sel et salaisons en Amorique Gallo-Romaine" in Gallia 30 p 199-223; Bottini, P and Freschi, A (1993) Sulla Rotta della 'Venus': Storie di navi, commerci e ancore perdute - Catalogo della mostra - Maratea 1991 Ministero beni Culturali Ambientali and Centro Culturale Maratea (Taranto).

such evidence will tend towards an overestimation of the scale of the provincial economies. More local distribution seems to have been undertaken in a variety of other forms of containers, particularly small glass or ceramic jars some quantification of which is necessary to any understanding of the relative importance of the different forms of provincial production.

As a consequence this thesis will concentrate upon outlining the character of fish sauce production within Eastern Spain: its relationship to the wider patterns of the villa economy and as industrial production being associated with that of salt and purple dye. This understanding requires some cognizance of those individuals involved in both the production and exchange of these commodities and thus of the forms in which this trade took place.

One of the most problematic aspects of the Roman occupation of the Iberian Peninsula is to define the consequences of the Third Century AD and the character of the economy of the Late Roman, Visigothic and Byzantine periods. What should become apparent is the essential continuity and economic stability of the region through the Punic to Late Roman periods. Forms of production and trade do not seem to have undergone substantial change, although an expansion of Tarraconensian production seems to have taken place during the late First Century BC - First Century AD. The opening up of the market afforded by the armies of the Rhine frontier and the establishment of the *annona* system to provision the city of Rome seems to have provided an important stimulus to the development of the economies of the provinces of the Western Mediterranean. This trade, however, seems to have remained in the hands of private merchants or *negotiatores* and one should note the more ready juxtaposition of social, political and economic criteria within the rationalism of more antique systems of exchange. This blurring of economic distinctions led 'primitivist' analysts of the ancient economy to argue that antiquity essentially lacked an 'economy' in the modern sense. Clearly, however, there was an understanding of markets and of questions of supply and demand, and although practitioners of commerce were generally frowned upon there was little disagreement as to the potential profitability that could be achieved by an involvement in commerce. Purely economic transactions seem to have operated alongside stimuli of a more political nature - thus for example,

the provision of taxation and requisition;<sup>14</sup> and of social obligation - as evidenced by systems of gift exchange. Purely economic considerations clearly did exist, however, and Xenophon's definition of οἰκονομικός is merely pertinent to the concern of our literary sources to limit capital outlay rather than suggesting an accurate picture of the lack of focus in the ancient economy. Before discussing these points in more detail, however, it is worth outlining the character of the different varieties of fish sauce as they are evidenced by the literary sources and it is to this that our attention must now turn.

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<sup>14</sup> cf Hopkins, K (1980) "Taxes and trade in the Roman Empire" in JRS 70 p 101-125 on the economic consequences of taxation.

## ANCIENT FISH SAUCES

### 1. LITERARY EVIDENCE FOR THE TYPES OF FISH SAUCE

Fish formed one of the principal components of the ancient diet and the archaeological and numismatic evidence for fishing is plentiful within Eastern Spain.<sup>1</sup> However, fishing could only become economically significant with the introduction of processing, as fresh fish could not easily be transported in any quantities over long distances. Fresh, and sometimes even live fish, were shipped between communities, but the quantities involved must have been small and the prices high.<sup>2</sup> Access to plentiful supplies of fresh fish was considered to be a major aspect of maritime villas as well as a source of profit to their owners.<sup>3</sup> Literary sources amply accord the importance that was placed on the provision of fish by members of the Italian aristocracy: Pliny records that the use of fish ponds, presumably in a commercial capacity, was begun by Licinius Murena<sup>4</sup>, whose precedent was followed by a number of prominent Romans: for example, L. Marcus Philippus, Q. Hortensius and L. Licinius Lucullus to name but a few. Not only could these fish tanks be used to provide fresh fish for the tables of their owners but they could also be used as a commercial enterprise breeding fish<sup>5</sup>, fattening up imported fish prior to market<sup>6</sup>, or to maintain a supply of fresh fish.<sup>7</sup> Such tanks were clearly objects of great capital potential, both in terms of what was required to

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<sup>1</sup>For the evidence for fishing within the Iberian Peninsula, cf Moreno Paramo, A and Abad Casal, L (1970) "Aportaciones al estudio de la pesca en la antigüedad" in Habis 1-2 p 209-221; Da Viegas Ferreira, O (1968) "Algumas notas acerca da pesca na antigüidade" in O Arqueólogo Português 3rd ser. 2 p 113-133. For fishing, cf chapter 3.

<sup>2</sup>Hortensius is derided for sending to Puteoli for fish for dinner even though he possessed expensive fish tanks, cf Varro De Re Rustica 3.17.5. Horace refers to the spending of 3,000 [sesterces?] on fish, cf Horace Satires 2.4: *It is a monstrous sin to spend three thousand on the fish market, and then to cram those roving fishes in a narrow dish.* (trans. Loeb ed.). For the shipping of fish, cf Corcoran, T H (1957) The Roman Fishing Industry of the Late Republic and Early Empire (unpublished PhD thesis, Northwestern University).

<sup>3</sup>On the role of fishponds, cf Corcoran, T H (1959) "Roman Fish Ponds" in Classical Bulletin 35 p 37-9, 43.

<sup>4</sup>Pliny NH 9.170.

<sup>5</sup>Martial 10.30.21; Varro De Re Rustica 3.3.4; Pliny NH 8.44.

<sup>6</sup>Macrobius Satyricon 3.15.7.

<sup>7</sup>Varro De Re Rustica 3.17.3; Pliny NH 9.171.

maintain them but also in the profits to be accrued. Varro records that the great cost of maintaining fish ponds meant that they could only be run at a loss with C. Hirrius being said to have spent 12,000 sesterces on feeding his fish.<sup>8</sup> Despite the necessity for a large scale capital outlay and quantity of fish to make these fish tanks profitable, such clearly were seen as a worthwhile investment. The comparatively small estate of Hirrius was sold for 4,000,000 sesterces on the basis of the large quantities of fish.<sup>9</sup> Similarly Varro estimates that a maritime villa could produce a profit of 100,000 sesterces as opposed to 10,000-20,000 sesterces for estates lacking marine resources.<sup>10</sup> L. Lucullus is particularly noted with regard to his ownership of fish ponds for which he is said to have cut through a mountain so as to supply them with sea-water.<sup>11</sup> It is evident, however, that his investment was worthwhile, although our sources disagree about the exact worth of Lucullus' fish ponds: Columella says that the fish tanks sold for 400,000 sesterces<sup>12</sup>, a price that Macrobius records for the fish alone.<sup>13</sup> Pliny says that the fish cost 4,000,000 sesterces.<sup>14</sup> Columella advises that if you own land by the sea you

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<sup>8</sup> Varro *De Re Rustica* 3.17.1: *There are two kinds of fish ponds, the fresh and the salt. The one is open to common folk, and not unprofitable, where the nymphs furnish the water for our domestic fish; the ponds of the nobility, however, filled with sea-water, for which only Neptune can furnish the fish as well as the water, appeal to the eye more than the purse, and exhaust the pouch of the owner rather than fill it. For in the first place they are built at great cost, in the second place they are stocked at great cost, and in the third place they are kept up at great cost. Hirrius used to take in 12,000 sesterces from the buildings around his fish ponds; but he spent all that income for the food which he gave his fish.* (trans. Loeb ed.) Unfortunately it is unclear what economic activity Varro is citing when he refers to Hirrius making a profit of 12,000 sesterces from the buildings around his fish ponds- it would perhaps be tempting to see this as the profit of commercial exploitation of Hirrius' fish ponds although evidence in support of this is lacking.

<sup>9</sup> Pliny *NH* 9.171; Varro *De Re Rustica* 3.17.3: *No wonder; for I remember that he lent to Caesar on one occasion 2,000 Lampreys by weight; and that on account of the great number of fish his villa sold for 4,000,000 sesterces.* (trans. Loeb ed.).

<sup>10</sup> Varro *De Re Rustica* 3.2.17: *Was it not L. Abuccius, who is, as you know, an unusually learned man, who used to remark likewise that his estate near Alba was always beaten in feeding by his steading? For his land brought in less than 10,000, and his steading more than 20,000 sesterces. He also claimed that if he had got a villa near the sea, where he wanted one, he would take in more than 100,000 from the villa. cf also 3.2.11: [description of villa] I have seen there large flocks of geese, chickens, pigeons, cranes, and pea fowl, not to speak of numbers of dormice, fish, boars, and other game. His book-keeper, a freedman who waited on Varro and used to entertain me when his patron was away from home, told me that he received, because of such husbandry, more than 50,000 sesterces from the villa every year.* (trans. Loeb ed.).

<sup>11</sup> Varro *De Re rustica* 3.17.3: *While, on the other hand, after Lucius Lucullus had cut through a mountain near Naples and let a stream of sea-water into his ponds...* (trans. Loeb ed.).

<sup>12</sup> Columella *Re Rustica* 8.16.5.

<sup>13</sup> Macrobius *Satyricon* 3.15.6.

<sup>14</sup> Pliny *NH* 9.170.

should develop it as a source of revenue<sup>15</sup> and he goes on to recommend the breeding of 'valued' imported fish.<sup>16</sup>

Evidently there was a great deal of profit to be made from the supply of fresh fish, although to judge by the hostility shown by our sources towards fish ponds, they were viewed as a base technique of acquiring wealth. Cicero jeered at the owners as *piscinarium Tritones*.<sup>17</sup> The keeping of fish as pets was widely criticised and Columella says that the raising of aquatic creatures on dry land was a perversion of farming practice and therefore unnatural.<sup>18</sup>

Despite the clear profitability of such fish tanks, the provision of fish will only have become widely economically viable with the utilisation of processing techniques. In the absence of refrigeration, smoking, drying and salting were used for preservation and it is with salting that we are concerned here. The preservation of foods by salt took one of two forms either as *salsamentum* (or τάριχος in Greek), or as sauces. *Salsamentum* literally referred to all forms of meat preserved by salting although it was particularly used to describe fish and shall be discussed in more detail in chapter five. The second technique consists of the production of sauces made from the offal of the fish that was unused in the salting of the meat, which was fermented with a brine mixture to produce a pungent salt-based sauce.

There are four types of fish sauces: *Garum*, *Muria*, *Liquamen* and *Hallec*<sup>19</sup> which appear to have differed according to their relative salinity, the types of fish used and the methods of preparation. A precise definition of their character is, however, difficult as the terms were often used without precision. *Garum* was a Greek term which was supposed to have been derived from a fish called the γάρπος.<sup>20</sup> Ausonius says

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<sup>15</sup>Columella *Re Rustica* 8.16.6.

<sup>16</sup>Columella *Re Rustica* 8.17.8.

<sup>17</sup>Cicero *Ad Atticum* 2.9.77.

<sup>18</sup>Columella *Re Rustica* 8.16.1.

<sup>19</sup>The latter sauce receives a variety of spellings: *Hallec*, *Hallex*, *Allec*, *Alec*, and *Allex*. For convenience I will use only *Hallec*, unless quoting a source that uses another version of the term.

<sup>20</sup>Pliny *NH* 31.43.93: [*garum*] *olim conficiebatur ex pisce quem Graeci γάρπος vocabant*. "Once this used to be made from a fish that the Greeks called γάρπος." (trans. Loeb ed.). cf also Isidore *Origines* 20.3.19: *Garum est liquor piscium salsus, qui olim conficiebatur ex pisce quem Graeci garon vocabant; et quamvis nunc ex infinito genere piscium fiat, nomen tamen pristinum retinet a quo initium sumpsit*. "and although now it is made from an infinite variety of fish, nevertheless it retains the original name from which it began." (trans. Loeb ed.). For the fullest list of sources for the

that there was no Latin term to designate *Garum* and that the Greek had to be used: *scis autem me id nomen muriae, quod is usu vulgi est, nec solere nec posse dicere, cum scientissimum veterum et Graeca vocabula fastidientes Latinum in gari appellatione non habeant.*<sup>21</sup> A Greek origin is further evidenced by its use in the Greek world in the Fifth Century BC according to the Fifth Century comic writers Plato, Cratinus and Pherecrates.<sup>22</sup> The earliest Latin reference to *Garum* in the De Lingua Latina of Varro<sup>23</sup> although its use prior to this can be surmised from the references to *Hallec* in Plautus.<sup>24</sup> Its exact characteristics, however, have been distorted by the invective that is a feature of ancient references to fish sauces. The Elder Pliny describes it in the words: *Aliud etiamnum liquoris exquisiti genus, quod Garum vocavere, intestinis piscium ceterisque quae abicienda essent sale maceratis, ut sit illa putrescentium sanies.*<sup>25</sup> This is a view reiterated by Seneca and Artimedorus.<sup>26</sup> This peculiar method of production involving the maceration of the fish is responsible for a miscomprehension of its character and thus a hostile press in the ancient sources. However, it seems to have been a prized sauce and to have been highly regarded by a number of our sources: Martial calls it *nobile Garum*<sup>27</sup> and devotes an entire epigram to its praises.<sup>28</sup> Pliny similarly praises *Garum*, describing it as *liquoris exquisiti genus.*<sup>29</sup> It

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charactersitics of the four fish sauces of Curtis, R I (1978) The Production and Commerce of fish sauce in the Western Roman Empire (unpublished PhD thesis University of Maryland).

<sup>21</sup> Ausonius Epistulae 25: "But you know that I am neither accustomed nor able to pronounce that name muria which is popularly used, though the most learned of the ancients, even while disdain to use Greek terms, have no Latin name by which to call garum." (trans. Loeb ed.).

<sup>22</sup> Plato Comedicus in Athenaeus 2.67c: σαπρῶ γάρῳ βαπτουτες αποπνιξουσι με. "They'll dip me in rotten fish pickle and drown me ." (trans. Edmonds, J M (1957) The Fragments of Attic Comedy vol I frag. 198 (Leiden).).

<sup>23</sup> Varro De Lingua Latina 9.40.66: *item qui reprehendunt, quod non dicatur ut unguentum untuenta vinum vina sic acetum aceta garum gara, faciunt imperite.*

<sup>24</sup> Plautus Persa 105: *Ecquid hallecis?*; Aulularia frag. 5: *qui mi holera cruda ponunt, hallec addunt*; Poenulus 1310: *tunc hic amator audes esse, hallex viri, aut contrectare quod mares homines amant?*

<sup>25</sup> Pliny NH 31.43.93: "There is yet another kind of choice liquor, called garum, consisting of the guts of fish and the other parts that would otherwise be considered refuse; these are soaked in salt, so that garum is really liquor from the putrefaction of these matters." (trans. Loeb ed.).

<sup>26</sup> Seneca Epistulae 95.25: *Quid? Illud sociorum garum, pretiosam malorum piscium saniem, non credis urere salsa tube praecordia?* "What? Do you not think that the so-called 'Sauce of the Provinces', the costly extract of poisonous fish, burns up the stomach with its salted putrefaction?" (trans. Loeb ed.); Artimedorus Onirocriticon 1.66: ἔστι γὰρ οὐδὲν ἄλλο ὃ γάρως ἢ σηπεδῶν. "Garum is nothing but putrefaction." (trans. Curtis, R I (1978) op. cit n. 20).

<sup>27</sup> Martial 13.82: "the noble garum."

<sup>28</sup> Martial 13.102: *Expirantis adhuc scombri de sanguine primo accipe fastosum, munera cara, garum.*

<sup>29</sup> Pliny NH 31.43.93: "a kind of choice liquor." (trans. Loeb ed.).

seems to have been the highest quality of fish sauce being the liquid residue of the fermentation of fish and salt.

Whereas *Garum* seems to have been the primary product, *Hallec*, on the other hand, is of a more derivative character being the sediment left as residue after the *Garum* had been drawn off for bottling. Pliny calls it the sediment of *Garum* and states that it is composed of the unstrained dregs left from the production of the *Garum*.<sup>30</sup> His assertion that it came to form a fish sauce in its own right, however, seems unlikely as its production was entirely dependent upon that of *Garum* and we have no evidence that it was ever made in its own right, although modern equivalents in Indochina can be made separately.<sup>31</sup> *Hallec* does not appear to have been regarded as a luxury item with Cato recommending its use to feed slaves.<sup>32</sup> Plautus has Antanonides call Hanno *hallex viri*, the dregs of a man<sup>33</sup>, whilst Martial cites Baeticus' taste for *Hallec* as a sign of his vulgarity.<sup>34</sup> *Hallec* seems to have been considered of little value and it is probably to be equated with the fish paste, 'bagoong' produced in the Philippines today.<sup>35</sup> The word itself appears to have been of a Latin derivation appearing first in the works of Plautus<sup>36</sup>

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<sup>30</sup>Pliny NH 31.44.95: *Vitium huius est allex atque imperfecta nec colata faex. coepit tamen et privatim ex inutili pisculo nimimoque confici.* "Allex is the sediment of *garum*, the dregs, neither whole nor strained. It has, however, also begun to be made separately from a tiny fish, otherwise of no use." (trans. Loeb ed.).

<sup>31</sup>On modern Far Eastern fish sauces, cf Curtis, R I (1991) Garum and Salsamenta: Production and Commerce in Materia Medica (Leiden) p 15-26; Grimal, P and Monod, Th (1952) "Sur la veritable nature du 'Garum'" in REA 54 p 27-38.

<sup>32</sup>Cato De Agricultura 58: *Pulmentarium Familiae. Oleae caducae quam plurimum condito, parcito, uti quam diutissime durent. Ubi oleae comesae erunt, hallecem et acetum dato. Oleum dato in menses uni cuique S.I. salis uni cuique in anno modium satis est.* "Relish for hands: Store all the windfall olives you can, and later the mature olives which will yield very little oil. Issue them sparingly and make them last as long as possible. When they used up, issue fish pickle and vinegar, and a pint of oil a month per person. A modius of salt a year is sufficient." (trans. Loeb ed.).

<sup>33</sup>Plautus Poenulus 1310: *Ligula, i in malam cruce[m]. tune hic amator audes esse, hallex viri, aut contrectare quod mares homines amant? deglupta mena, sarrapis, sementium, manstruca, halagora, sampsa, tum autem plenior ali ulpicique quam Romani remiges.* cf Curtis, R I (1991) op. cit. n. 31 p 155 n 28.

<sup>34</sup>Martial 3.77: "Mullet does not please you, Baeticus, neither does thrush. You never care for hare, nor bear either. Cookies are not to your liking nor squares of cut cake, neither doe Libya and Phasis send their birds for you. You devour capers and onions afloat in putrid fish sauce and flesh from a dubious ham. Sprats are to your liking and white-skinned hearts of oak; you drink resinated wine, but shun Falernian. I suspect you have some private stomach trouble. For why else, Baeticus, do you eat rot?" (trans. Loeb ed.).

<sup>35</sup>cf Curtis, R I (1991) op. cit. n. 31 p 15-26; Grimal, P and Monod, Th (1952) op. cit. n. 31 p 27-38.

<sup>36</sup>cf Plautus Persa 105: *Ecquid hallecis?*; Aulularia frag. 5: *qui mi holera cruda ponunt, hallec addunt*; Poenulus 1310: *tune hic amator audes esse, hallex viri, aut contrectare quod mares homines amant?*

and only evidenced in Greek literature with the works of Dioscorides in the First Century AD. The fish sauce *Hallec* may also have given its name to a fish<sup>37</sup>: Columella refers on a number of occasions to a small fish, the 'alecula'.<sup>38</sup> The Corpus Glossariorum Latinorum associates *Hallec* with specific fishes in a Sixth Century context.<sup>39</sup> In Medieval Latin *allec* was used to designate the herring<sup>40</sup> although Curtis<sup>41</sup> links it with a number of small Mediterranean fishes: the anchovy, sardine and shad; the bones excavated from *dolia* found in the 'Garum Shop' at Pompeii (Regio 1.12.8) have been identified as belonging to anchovies.<sup>42</sup> It is unlikely, however, that it was specifically produced only from these fish and although generally regarded as a low grade product its contents and quality must have been dependent upon that of the Garum with which it was associated.

*Muria*, the Greek ἄλμη, seems to have been a more general term used to describe any salt solution. Columella describes *Muria* as a brine solution that is produced by placing a jar of water in the sun for a period of several days to which salt is added until it has completely dissolved:

*Muriam duram sic facito: doliam quam patentissimi oris locato in ea parte vilae, quae plurimum solis accipit. Id dolium aqua caelesti repleto; ea est enim huic rei aptissima; vel si non fuerit pluvalis, certe fontana dulcissimi saporis. Tum indito sportam iunceam, vel sparteam, quae replenda sale candido, quo candidior muria fiat. Cum salem per aliquot dies videbis liquescere, ex eo intelliges nondum muriam esse maturam. Itaque subinde alium salem tandem ingeres donec in sporta permaneat integer, nec*

<sup>37</sup>Isidore Origines 12.6.39-40: *Allec pisciculus ad liquorem salsamentorum idoneus; unde et nuncupatus.* "the Allec was a small fish suitable for the liquor of slated fish, from which the fish derives its name." (trans. Curtis, R I (1978) op. cit. n. 20 p 14).

<sup>38</sup>Columella Re Rustica 6.8.2; 8.15.6; 8.17.12; 8.17.14.

<sup>39</sup>CGL 4.205.37: *Allec pisciculus ex mari modicus aptus etiam liquaminibus.* "the Allec was a small fish from the sea suitable for fish sauce." 5.560.36: *Allecis: nomen piscis.* 2.586.42: *liquamen garum salsas liquor allecis.* I regret that I have been unable to consult the Corpus directly, these texts are quoted from Curtis, R I (1984) "Negotiores Allecarii and the Herring" in Phoenix 38.2 p 146-158, cf esp. p 152 n 28.

<sup>40</sup>On the etymology of *Hallec* cf Curtis, R I (1984) op. cit. n. 39; Rose, V (1874) "Aringus, der Hering" in Hermes 8 p 224-227.

<sup>41</sup>cf Curtis, R I (1984) op. cit. n. 39 p 152-3.

<sup>42</sup>cf Curtis, R I (1979) "The Garum Shop in Pompeii" in Cronache Pompeiane 5 p 10-11.

*minuatur. Quod cum animdverteris, scias habere muriam maturiatem suam. Et si facere aliam voveris, hanc in vasa bene picata diffundes, et opertam in sole habebis. Omnem enim mucorem vis solis aufert, et odorem bonum praebet. Est et aliud muriae experimentum. Nam ubi dulcem caseum demiseris in eam, si pessum ibit, scies esse adhuc crudam: si innatabit, maturam.*<sup>43</sup>

*Muria* is cited in a similar context by the Elder Cato who used it to describe the brine mixture that is used in his recipe for bleaching salt.<sup>44</sup> The word is also used to designate the brine in which a number of foods were preserved such as turnips<sup>45</sup>, olives<sup>46</sup>, herbs<sup>47</sup> as well as other produce.<sup>48</sup> *Muria* seems particularly, however, to have become associated with the salting of fish and other meats: Cato describes *Muria* that is salty enough to float an egg is strong enough to pickle fish<sup>49</sup>, whilst Columella refers to it thus, *et tanquam salsamentum in Muria sua permanet*.<sup>50</sup> Pliny recalls a *Muria salsamentorum* and specifically links *Muria* to a brine of sardines<sup>51</sup>; Quintillian refers to

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<sup>43</sup>Columella *De Re Rustica* 12.6.1: "The following is the way to make hard brine. Place a wine-jar with as wide a mouth as possible in the part of the farmhouse which gets the most sun. Fill the jar with rain-water, for this is the most suitable for the purpose, or, if rain-water is not available, let it be at any rate spring water of very sweet flavour. Then place in the water a basket made of rushes or of bloom which must be filled of white salt, so that the brine may be whiter. When in the course of several days you see that the salt continues to melt, you will know from this fact the brine is not yet ready. You will, therefore, put in more salt from time to time until it remains unchanged in the basket and does not grow less. When you notice that it does so, you can be sure that the brine has come to maturity. And if you wish to make more brine, you will pour the brine already made into vessels well daubed with pitch and keep it covered up in the sun; for the action of the sun takes away all mustiness and causes a pleasant odour. There is also another method of proving that the brine is ripe; for, when you plunge a piece of fresh cheese into it, if it sinks to the bottom, you will know that it is still crude, but if it floats on the surface, you will know that it has reached maturity." (trans. Loeb ed.).

<sup>44</sup>Cato *On Agriculture* 88, cf appendix n. 33.

<sup>45</sup>Cato *On Agriculture* 7.

<sup>46</sup>Cato *On Agriculture* 7.4, cf appendix n. 34.

<sup>47</sup>Columella *De Re Rustica* 12.6.2: *Haec omnia una conditura commode servantur, id est aceti duas partes, et tertiam durae muriae si miscueris.* "All these are conveniently preserved by one method of pickling, that is to say, a mixture of two-thirds of vinegar and one third of hard brine." (trans. Loeb ed.).

<sup>48</sup>cf appendix n. 35.

<sup>49</sup>Cato *On Agriculture* 88, cf appendix n. 33.

<sup>50</sup>Columella *De Re Rustica* 12.55.4: "and just as salted fish remains in its own *muria*."

<sup>51</sup>Pliny *NH* 31.39.83: *quin et e muria salsamentorum recoquitur iterumque consumpto liquore ad naturam suam redit, vulgo e menis incundissimus.* "Moreover, from the liquor of salted foods salt is recovered by reboiling, and when evaporation is complete its saline character is regained. It is generally thought that the salt obtained from sardine brine is the most pleasant." (trans. Loeb ed.).

a fish preserved in *Muria*.<sup>52</sup> Herodotus says that the Egyptians ate fish dried or preserved in ἀλμη.<sup>53</sup> Isidore describes *Muria* as the brine used in the production of fish sauce: *Liquamen dictum eo quod soluti in salsamento pisciculi eadem humorem liquant. Cuius liquor appellatur salsugo vel Muria. Proprie autem Muria dicitur aqua sale commixta, effectaque gustu in modum maris*.<sup>54</sup> Pliny, however, appears to cite it as a specifically Spanish phenomenon being the name applied to the brine drawn off from salt springs by the inhabitants of the Iberian Peninsula.<sup>55</sup> Such a description is, however, evidently misleading as the wider use and production of *Muria* is well attested.<sup>56</sup> As well as being considered a brine solution, *Muria* receives notice in a number of sources as a fish sauce in its own right. Horace refers to a *Muria* used to preserve salt-fish from Byzantium which he subsequently used as a simple sauce.<sup>57</sup> Martial also speaks of *Muria* as a fish sauce on a number of occasions<sup>58</sup>, whilst Hesychius calls it ὁ τῶν ἰχθύων ζωμός.<sup>59</sup> Some *Muria* was evidently considered to be of a valued standard being described on *tituli picti* as *Muria Flos*<sup>60</sup> and we have already referred to the praise attached to Antipolitan *Muria*<sup>61</sup>, although it has been suggested that this sauce

<sup>52</sup>Quintillian *Institutio Oratoria* 8.2.3: *duratos muria pisces*.

<sup>53</sup>Herodotus *Histories* 2.77: ἰχθύων δὲ τοὺς μὲν πρὸς ἥλιον αὐήναντες ὠμοὺς σιτέονται, τοὺς δὲ ἐξ ἄλμης τεταριχευμένους. "some kinds of fish they eat raw, either dried in the sun or salted." (trans. Penguin ed.).

<sup>54</sup>*Origines* 20.3.20: "*Liquamen* is called by this name because small fish dissolved in *muria* produce the same liquid. The liquor of it is called *salsugo* or *muria*. Moreover, properly speaking, water mixed with salt is called *muria*, since a taste like the sea has been produced." (trans. Curtis, R I (1978) op. cit. n. 20). cf also n. 76.

<sup>55</sup>Pliny *NH* 31.40.83: *Hispaniae quadam sui parte et puteis hauriunt muriam appellantes*. cf also appendix n. 84.

<sup>56</sup>Pliny himself refers to the fame of *muria* from Antipolis and Thurii, cf *NH* 31.43.94: *sicut muria Antipolis ac Thurii, iam vero et Delmatia*. "just as Antipolis and Thurii are for *muria*, and today too also Dalmatia." (trans. Loeb ed.). cf also the Pompeian merchant A. Umbricius Scaurus who traded in *Garum*, *Muria*, *Liquamen* and *Hallec*, cf Curtis, R I (1988) "A. Umbricius Scaurus of Pompeii" in Curtis, R I (ed.) *Studia Pompeiana & Classica in honor of Wilhelmina F. Jashemski*, New York, vol. 1 p 19-50.

<sup>57</sup>Horace *Satires* 2.4.64-9.

<sup>58</sup>Martial 4.88; 10.48; 13.103: *Amphora muriae: Antipolitani, fateor, sum filia thynni essem si scombri, non tibi missa forem*.

<sup>59</sup>Hesychius s.v. ἄλμη: "sauce of fish." I regret that I have been unable to consult this source directly, cf Curtis, R I (1991) op. cit. n. 31 p 8 n. 9.

<sup>60</sup>ie the Best *Muria*, literally, the Flower of *Muria*. On the use of *tituli picti* for advertising, cf Curtis, R I (1984) "Product identification and advertising on Roman commercial amphorae" in *Ancient Society* 15-17 p 209-228.

<sup>61</sup>cf Pliny *NH* 31.43.94; Martial 4.88; 10.48; 13.103.

may in fact be *Garum* rather than *Muria*.<sup>62</sup> Some equation between *Garum* and *Muria* may have existed: Ausonius appears to imply that *Muria* was the popular Latin equivalent of *Garum*, although he rebukes Paulinus for such an incorrect use of the term<sup>63</sup>, but I can find no further evidence to support this synonymy. On the contrary its use and existence in its own right is attested by its appearance in the Digest of Justinian<sup>64</sup> and upon *tituli picti*.<sup>65</sup> Although the sources imply the existence of two forms of *Muria*: a brine solution and a fish sauce, it is impossible to ascertain the precise characteristics of *Muria* as a sauce and its relationship to the better attested *Garum* and *Hallec*. The term originally will have specifically referred to the brine used in the production and packing of salted fish products. This results in a tainting of the brine with fish giving it the appearance and character of a weaker liquid sauce and was presumably that used by Horace as a condiment.<sup>66</sup> The wide variety of fish associated with *Muria* would further support its use as a generic term for brine.<sup>67</sup> At some point, however, it seems to have acquired connotations of fish sauce beyond merely a bottling brine that could be used as a cheap condiment. Some seems to have been produced as a fish sauce in its own right even acquiring a measure of value, although this would appear to have been a secondary development from its original designation as a brine solution.

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<sup>62</sup>cf Curtis, R I (1978) op. cit. n. 20- Martial refers to Antipolitan *Muria* from both the tunny and mackerel, however, Pliny states that the mackerel was only used in making *Garum*. (NH 31.43.94: *Scomber quidem et Mauretania Baeticaque Carteia ex oceano intrantes capiunt ad nihil aliud utiles*. "The Scomber is caught also in Mauretania and at Carteia in baetica; the Scomber enters the Mediterranean from the Atlantic, but it is used only for making *Garum*." trans. Loeb ed.). However, Pliny is demonstrably incorrect in this as production of *Garum* from other marine species is well-attested, cf for a list of fish species used in the production of *Garum*, Grimal, P and Monod, T (1952) op. cit. n. 31 p 32.

<sup>63</sup>Ausonius *Epistle* 25: *Scis autem me id nomen muriae, quod in usu vulgi est, nec solere nec posse dicere, cum scientissimi veterus et Graeca vocabula fastidientes Latinorum in gari appellatione non habeant*. "But you know that I am neither accustomed nor able to pronounce that name *muria* which is popularly used, though the most learned of the ancients, even which disdaining to use Greek terms, have no Latin name by which to call *garum*." (trans. Loeb ed.).

<sup>64</sup>*Dig. Iust.* 33.9.3.1.

<sup>65</sup>For example, from Pompeii, cf *CIL* iv.5721 MUR; iv. 5722 MUR/IUNIO/AMPLON[io]? or AMPLIAT[o]?; iv.5723 MF/LB.UMBRICIA; iv.5724 MF/IB UMBRICIO ABASCLNTHO; iv. 5725 MF; iv. 5726 ]/MUR VET ?; iv.5727 MURI ?.

<sup>66</sup>Horace *Satires* 2.4.64-9.

<sup>67</sup>For the association of specific fish with *muria*, cf Grimal, P and Monod, T (1952) op. cit. n. 31 esp. p 31-2; Curtis, R I (1978) op. cit. n. 20 p 21-2; Curtis, R I (1991) op. cit. n. 31 p 166 n. 31. The types of fish used in the production of fish sauces are discussed more fully when we turn to fishing in chap. 3.

The fourth principal fish sauce is that of *Liquamen* and like *Muria* its identification is somewhat problematic. The term seems to have been of Latin origin only appearing in Greek as a transliteration.<sup>68</sup> It is derived from the word 'liquare' and is used in this regard as a generic description of liquids. This definition of *Liquamen* is supported by its earliest appearance, in the *De Re Rustica* of Columella, where it is used without precision. It is cited both as a liquid to be used or avoided in the production of honey<sup>69</sup>, although Columella omits to add any qualifying reference as to the nature of the *Liquamen* concerned. Elsewhere Columella uses it to refer to a solution of boiled lupins, the dregs of wine, the lees of olives<sup>70</sup>, and he suggests feeding sweet *Liquamen* to bees.<sup>71</sup> Caelius Aurelianus describes a *Liquamen* made from vine cuttings mixed with rainwater.<sup>72</sup> It was used to describe liquids associated with the salting of meat and fish<sup>73</sup>, in particular Columella advises that prior to approaching bees one should abstain from sex, alcohol and strongly flavoured food, *ut sunt salsamenta, et eorum omnia Liquamen*.<sup>74</sup> Clearly Columella is associating *Liquamen* with

<sup>68</sup>*Geoponica* 20.46.1: λικουαμεν.

<sup>69</sup>Columella *De Re Rustica* 9.8.9: *Deinde cum ad adorem dulcis liquaminis complures apes irrepserunt.* "Then when a number of bees, attracted by the smell of sweet liquid." 9.14.17: *Post confectam brumam diebus fere quadraginta quidquid est repositi mellis, nisi liberalius relictum sit consumunt, saepe etiam vacuatis ceris usque in ortum fere Arcturi, qui est ad idib. Februarii, ieiune favis accubantes torpent more serpentum, et quiete sua spiritum conservant, quem tamen ne amittant, si longior faves incesserit, optimum est per aditum vestibuli siphonibus dulcia liquamina imittere, et ita penuriam temporum sutinere, dum Arcturi ortus et hirundinis adventus commodiores polliceantur futuras tempestates.* "When the height of winter is passed, for a period of about forty days, they use up all the honey which is stored, unless an unusually generous allowance is left, and often too, after they have emptied the waxen cells, they lie fasting in the honey combs in a torpid condition, like snakes until about the rising of Arcturus, with is on the Thirteenth of February, and by keeping quiet preserve the breath of life; in order, however, that they may not lose it, if too long a fast occurs, it is best to pour sweet liquids through the entrance of the porch by means of small pipes and thus support them during the temporary scarcity until the rising of Arcturus and the coming of the swallow with the promise of more favourable weather for the future." (trans. Loeb ed.).

<sup>70</sup>Columella *De Re Rustica* 7.4.7.

<sup>71</sup>cf Columella *De Re Rustica* 9.8.9; 9.14.17.

<sup>72</sup>Caelius Aurelianus *Tardarum Passionum* 2.9.167.

<sup>73</sup>Columella *De Re Rustica* 6.2.7: "the liquid of well-salted animal fat." (trans. Loeb ed.).

<sup>74</sup>*De Re Rustica* 9.14.3: *Verum maxime custodiendum est curatori, qui apes nutrit, cum alvos tractare debebit, uti pridie castus ab rebus venereis, neque temulentus, nec nisi lotus ad eas accedat, abstineatque omnibus redolentibus esculentis, ut sunt salsamenta, et eorum omnia liquamina; itemque ferentibus acrimoniis alii vel cerparum ceterarumque rerum similia.* "But very great care must be taken but the man in charge, who feeds the bees, when he must handle the hives, that the day before he has abstained from sexual relations and does not approach them when drunk and only after washing himself, and that he abstains from all edibles which have a strong flavour, such as pickled fish and all the liquids which accompany them, and also from the acrimonius stench of garlic and onions and all other similar things." (trans. Loeb ed.).

*Salsamentum*, however, it is uncertain whether he is referring to *Muria* or *Garum* as he does not specify whether or not the liquid is the brine used in producing and packing the meat (ie *Muria*) or that which is given up by the *salsamenta* (ie *Garum*). A number of sources link *Liquamen* with *Garum*.<sup>75</sup> Isidore appears to associate the two, the difference being that *Liquamen* was made from small fish dissolved in *Muria*.<sup>76</sup> The Fifth Century physician Caelius Aurelianus clearly believed that the two were synonymous<sup>77</sup>, whilst Gargilius Martialis titles his recipe for the production of fish sauce: *Confectio liquaminis quod oenogarum vocant*.<sup>78</sup> In Diocletian's edict of Maximum Prices the Greek γάρου is translated as *Liquamen* in the Latin text.<sup>79</sup> It would appear, therefore, that *Liquamen* was in effect the Latin equivalent for γάρου, the Greek *Garum*: Grimal and Monod go as far as to call it the official name of *Garum*.<sup>80</sup> However, Ausonius clearly states that there was no Latin equivalent to *Garum*<sup>81</sup>, similarly the *De Medicamentis* of Marcellus Empiricus cites both *Garum*, *Muria* and *Liquamen*.<sup>82</sup> This differentiation between the various fish sauces is also supported by the archaeological evidence. The house of the prominent Pompeian fish sauce merchant, A. Umbricius Scaurus contains a monochrome mosaic of *opus tessellatum* located within an atrium. Within each of the four corners of the mosaic are depicted individual Pompeian form VI *urcei* incorporating *tituli* that declare their

<sup>75</sup>Corcoran (1963) "Roman Fish Sauces" in *Classical Journal* 58 p 204, believes them to have been practically synonymous.

<sup>76</sup>Isidore *Origines* 20.3.19-20: *Garum est liquor piscium salsus; qui olim conficiebatur ex pisce quem Graeci garoj vocabant; et quamvis nunc ex infinto genere pisium fiat, nomen tamen pristinum retinet a quo initium sumpsit. Liquamen dictum eo quod soluti in salsamento pisciculi eundem humorem liquant. Cuius liquor appellatur salsugo vel muria. Proprie autem muria dicitur aqua sale commixta, effectaque gustu in modum maris. "Garum is the salted liquor of fish which at one time used to be made from the fish which the Greeks called γάρου; and although it is now made from many kinds of fish, nevertheless, it retains its original name with which it began. *Liquamen* is called by this name because small fish dissolved in *muria* produce the same fluid. The liquor of it is called *salsugo* or *muria*. Moreover, properly speaking, water mixed with salt is called *muria*, since a taste like the sea has been produced."* trans. Curtis, R I (1978) op. cit. n. 20.

<sup>77</sup>Caelius Aurelianus *Tardarum Passionum* 2.1.40: *Garum quod appellamus liquamen*.

<sup>78</sup>Pseudo.-Gargilius Martialis 62. cf Rose, V (1874) op. cit. n. 40 p 224-7, cf also Curtis, R I (1991) op. cit. n. 31 appendix 1.

<sup>79</sup>3.6-7. cf Tenney Frank (1959) *An Economic Survey of Ancient Rome* (Baltimore) vol. 5. The Latin and Greek texts of St Pachomius *Regula* 45 also equate γάρου with *liquamen*. Unfortunately I have been unable to consult this source directly, cf Curtis, R I (1991) op. cit. n. 31 p 35 n. 29.

<sup>80</sup>Grimal, P and Monod, T (1952) op. cit. n. 31 p 28-9.

<sup>81</sup>Ausonius *Epistle* 25, cf n. 63.

<sup>82</sup>*De Medicamentis* 1.106; 30.47-8, 72-5. cf Curtis, R I (1978) op. cit. n. 20.

contents to be *Garum* and *Liquamen*.<sup>83</sup> Scaurus was evidently involved in the trading of all forms of fish sauce with *Garum*, *Liquamen*, *Muria* and *Hallec* being cited on *tituli picti* of his fish sauce vessels from Pompeii, as well as vessels from elsewhere within the Empire.<sup>84</sup> A number of *tituli picti* include references to *Liquamen* alongside *Garum*, and also with *Muria*.<sup>85</sup> This coincidence is probably the result of the reuse of the vessels, although if *Liquamen* and *Garum* are to be equated the such a duplication would be unnecessary. Corcoran<sup>86</sup>, therefore, believes that the two names must be referring to the same product; but although the sources seem to show some similarity between *Garum* and *Liquamen*, we have no evidence for such a relationship between *Liquamen* and *Muria*. The appearance of the two names must then refer to the reuse of the vessels. The reason for the differentiation of the products, however, remains obscure, whilst their appearance together in the mosaic of Scaurus and their citation upon *tituli picti* points to them being separate entities. Although Isidore cites the difference as being the use of small fish in the production of *Liquamen*<sup>87</sup>, both *Garum* and *Liquamen* are cited upon *tituli* as having been made from the Scomber, and as we shall discuss later, there seems to have been little differentiation between types of sauce on the basis of the use of different species of fish in their production.

<sup>83</sup>*Urceus* A: G F SCO[m]/SCAURI/EX OFFI[ci]/NA SCAU/RI; B: LIQUA/FLOS; C: G F SCOM/SCAURI; D: LIQUAMEN/OPTIMUM/EX OFFICI[n]/A SCAURI. For the floor mosaic of Umbrius Scaurus, cf Curtis, R I (1984) "A Personalised Floor Mosaic from Pompeii" in *AJA* 88 p 557-566.

<sup>84</sup>Scaurus: *CIL* iv.5699: LIQUAMEN; iv.5700: LIQUAMEN/A.U.S; iv.5701: LIQUAM; iv.5702: LIQ[ ]; iv.5703: VI/LIQ; iv.5704: LIQUAM/A UMBRICI SCAURI; iv.5705: a LIQ/L.UMBRICI SCLURI/LUC b LIQ/A.UMBRICI SCLURI/ L U C; iv.5706: LIQ/FLOS/FLOS; iv.5707: LIQUAMEN/OPTIMUM; iv.5708: LIQUAMEN/OPTIMUM on handle CON[ ] ARIS[ ]; iv.5709: LIQUAMEN/OPTIMUM/CAMPLN/ ; iv.5710: LIQUAMEN/OPTIMUM/AB UMBRICIA[ ]; iv.5711: a LIQUAMEN/OPTIMUM/A.UMBRICI SCAURI b LIQUAMEN/OPT[i]MUM/a.u]MBRICI SCAURI c LIQUAMEN/OPTUMMUM/A.UMBRICI SCAURI; iv.5712: LIQUAMEN/OPTIMUM/A.VIRNIO.MODESTO/AB.AGLTHOPODE; iv.5713: LIQUAMEN/OPTIMUM/AB UIBU[ ]; iv.5714: LIQUAMEN/FLOS/OPTIMUM; iv.5715: LIQUAMEN PRIMUM; iv.5716: LIQ F[ /EXCL/SCOM/C.CORNELI/HERMEROTIS/MA at 90° to this is DE DOMESTI. For other sauces, cf *Garum*: iv. 5657-5695; *Hallec*: iv. 5717-5720; *Muria*: iv. 5721-5727. The evidence for the incidence of *Liquamen* upon *tituli picti* across the Empire is vast, they shall be discussed more fully in chap. 4.

<sup>85</sup>*Liquamen* and *Garum*: *CIL* iv.5683: LIQ-/G.F SCOMBR/SCAURI; iv.10280: G F EGG /LIQUAMEN/OPTIMUM; xv.4718: G F/LIQ -written in two different hands? *Liquamen* and *Muria*: iv.10746: M F/LIQUAMEN OPTIMUM/A U[mbri]CI [sc]AUR[i].

<sup>86</sup>Corcoran, T H (1957) op. cit. n. 2.

<sup>87</sup>Isidore *Origines* 20.3.20: *Liquamen dictum eo quod soluti in salsamento pisciculi eadem humorem liquant.*

It has been suggested on the basis of the liquid derivation of *Liquamen* and its association with *Garum*, that the former was a more diluted form of *Garum* with a lower level of salinity and poorer preservative qualities.<sup>88</sup> In this regard it is associated with the modern production of Vietnamese sauces with the drawing off of the highest quality sauce ('Nuoc-nhut') to leave an undigested paste residue (nuoc-xat) which is then leached with brine to produce a lower quality sauce.<sup>89</sup> I remain unconvinced by this definition: although *Liquamen* is derived from 'liquare', none of the sources describing its production define it as leached *Hallec*. We have already referred to Isidore's definition of *Liquamen*, in accordance with which the Tenth Century *Geoponica* also states that *Liquamen* was produced from small fish:

Το καλούμενον λικουάμεν οὕτω γίνεται. τὰ ἔγκατα τῶν ἰχθύων βάλλεται εἰς σκεῦος, καὶ ἀλίζεται! καὶ λεπτὰ ὀψαρίδια, μάλιστα δὲ ἀθερίναι, ἢ λεπτὰ τριγλία, ἢ μαινίδια, ἢ λυκόστομοι, ἢ ὅ ἂν δόξη λεπτὸν εἶναι, πάντα ὁμοίως ἀλίζεται, καὶ ἐν ἡλίῳ ταριχεύεται πυκνῶς δονούμενα.<sup>90</sup>

As we have seen, however, the scomber was used both for *Garum* and *Liquamen*, whilst the recipe for *Garum* given by Ps.-Rufius Festus states that small salted fish were used to produce *Garum*.<sup>91</sup> Thus, it would appear that *Garum* and *Liquamen* were not differentiated on the basis of the types of fish that were used in their production. Had the difference been based upon *Liquamen*'s character as a form of leached *Hallec* then it would be reasonable to expect some reference to this in the

<sup>88</sup>Curtis, R I (1991) op. cit. n. 31 p 177.

<sup>89</sup>Curtis, R I (1991) op. cit. n. 31 p 20-1.

<sup>90</sup>*Geoponica* 20.46.1: "The so-called *liquamen* is made in this manner: the intestines of fish are thrown into a vessel and salted. Small fish, either the best smelt, or small mullet, or sprats, or wolffish, or whatever is deemed to be small, are all salted together and, shaken frequently, are fermented in the sun." (trans. Curtis, R I (1991) op. cit. n. 31).

<sup>91</sup>Ps.-Rufius Festus *Breviarum*: *Confectio gari. sume pisces minores salsos aut si salsi non fuerint, saliantur pauco sale. et mitte ex illis sextarium unum et de bono vino sextarios tres et coque in aereo vase usque dum duca partes consumantur et tertia remaneat. tum cola per saccum usque ad claritatem et refrigera. tum mitte in vitream ampullam et utere.* "Recipe for garum. Take smallish salted fishes or, if there are no salted ones, salt them with a little salt. Put one *sextarius* of these, and three *sextarii* of good wine and cook in a bronze pot until two parts are consumed and one part remains. Then strain through a bag until clear and chill. Then put in a glass bottle and use."

sources describing its production. On the contrary, such a washed sauce may in fact be better associated with the fish sauce form of *Muria*. As we have seen *Muria* was a brine solution and its appearance and character as a weaker fish sauce would parallel that of the washed sauce. Certainly the two will have been similar in appearance and salinity.

Despite this, as we have seen, some association between *Garum* and *Liquamen* did exist, at least in the Later Empire. In fact *Liquamen* appears to have replaced *Garum* as a generic description of fish sauce; Diocletian's Edict lists only the two qualities of *Liquamen*, 'Liquamen Primum' and 'Secundum'.<sup>92</sup> Although evidently this was not a comprehensive list, it does at least imply that *Liquamen* was coming to be associated with the wider repertoire of fish sauces. This wider meaning of *Liquamen* can also be seen in a constitution of Valentinian I, Valens and Gratian dated to AD 370-5 that bans the exchange the wine, oil and *Liquamen* beyond the Imperial frontiers.<sup>93</sup> In this case, as in Diocletian's Edict, *Liquamen* is being used as a generic term for all types of fish sauce. However, even though *Liquamen* seems to have usurped the position of *Garum*, it still seems to have been used to denote liquids in a wider sense.<sup>94</sup> Thus even in the Late Empire we should be wary of applying *Liquamen* merely to fish sauces.

*Liquamen*, therefore, originally seems to have designated any form of liquid and it is used as such by Columella. It was a sufficiently vague term to be applied to a number of different types of sauces including those of fish. That it gradually came to be associated with the most notable sauce, that of fish, is evident. In fact it seems to have come closest to being used as a Latin translation of γάρου, although to judge by Ausonius this use might not have been particularly commonplace and may have been more for official use and convenience. Despite being increasingly applied to fish sauces it does not seem to have lost its wider meaning, presumably sufficient for Ausonius not to consider it as the Latin equivalent of *Garum*, presumably he will have seen it in terms of its denoting a liquid. When used to designate a fish sauce, its character was evidently similar to that of *Garum* considering the association between the two. The account of

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<sup>92</sup>Edict 3.6-7.

<sup>93</sup>*Codex Iustinianus* 4.41.1: *Imppp. Valentinianus Valens et Gratianus AAA. ad Theodotum magister militum. Ad barbaricum transferendi vini et olei et liquaminis nullam quisquam habeat facultatem ne gustus quidem causa aut usus commerciorum.* (ed. Krueger, P (1880) *Corpus Iuris Civilis* 2).

<sup>94</sup>cf Caelius Aurelianus *Tardarum Passionum* 2.9.167.

*Garum* production given by the *Geoponica*<sup>95</sup> seems to suggest that *Liquamen* referred to the unprocessed mixture of salt and fish that was placed in the vats. It is applied to the salt-fish solution prior to the removal of the *Garum* by straining. Thus it was a partially processed fish sauce with poorer preservative qualities and the best varieties not being dissimilar to *Garum*, whilst those of a lesser standard were closer to *Hallec*.

Thus *Liquamen* was a vague term used to designate any form of prepared liquid whether it be made from fruit, vegetable, meat or fish. As the most prominent of these liquids, fish sauce came increasingly to have a greater association with *Liquamen* and as a generic description, *Liquamen* came to be used as the Latin equivalent of γαρος. Even when the tendency to use it thus was at its strongest in the Late Empire, its original meaning does not seem entirely to fall into abeyance.<sup>96</sup>

As well as the four principal fish sauces there are a variety of fish sauces that were produced by mixing with other products. Of these four seem to have been fairly widely used and attested: *Hydrogarum* (ὕδρογαρος), a mixture of *Garum* and water<sup>97</sup>; *Oleogarum*, a mixture of oil and *Garum* (ἐλαιόγαρος, γαρέλαιον, γαρέλεον or γαρέλεν)<sup>98</sup>; *Oxygarum* (ὄχυγαρος) consisting of vinegar and *Garum*<sup>99</sup>; and *Oenogarum* (οἰνόγαρος) of wine and *Garum*.<sup>100</sup> Martial appears to refer to *Garum* with egg<sup>101</sup> whilst there are several references to ὀξύλαμη apparently composed of

<sup>95</sup>*Geoponica* 20.46.1.

<sup>96</sup>A fifth fish sauce is referred to by Pliny the Elder, cf *NH* 31.42.92: *praeter haec etiamnum appellatur in salinis salsugo, ab aliis salsilago, tota liquida, a marina aqua salsiore vi distans*. "Besides these salines there is also what is called at the salt pools *salsugo*, or sometimes *salsilago*. It is entirely liquid, differing from sea brine by its more salty character." (trans. Loeb ed.). It seems, however, to be the same as *Muria*, cf Isidore *Origines* 20.3.20: *Cuius liquor appellatur salsugo vel muria*. "The liquor of it is called *salsugo* or *muria*." (trans. Curtis, R I (1978) op. cit. n. 20).

<sup>97</sup>SHA *Vita Elagabali* 29.5: *hydrogarum Romanorum ducum primus publice exhibuit, cum antea militaris mensa esset, quam postea statim Alexander reddidit*. "He was the first Roman Emperor to serve at a public banquet fish-pickle mixed with water, for previously this had been only a soldiers' dish- a usage that was later promptly restored by Alexander." (trans. Loeb ed.); Apicius *De Re Coquinaria* 2.2.1.2; Leo Medicus 5.3.6, 6.9; Paul of Aegina 3.37.4; Aetius 3.85; Anon. *De Alim.* 1.39; Alexander of Tralles.

<sup>98</sup>Hesychius γαρέλαιον; Ps.-Gargilius Martialis 62: *Confectio liquaminis quod oenogarum vocant*.

<sup>99</sup>Athenaeus 2.67e, 9.366c; Martial 3.50.4; Apicius *De Re Coquinaria* 1.34.1-2.

<sup>100</sup>St Pachomius *Regula* 45: *vinum et liquamen absque loco aegrotantium nullus contingat*; Apicius *De Re Coquinaria* 1.31, 3.4.5, 6.1, 20.1, 21.1, 4.2.20, 2.26, 2.31, 5.1, 5.8.2, 7.4.5, 10.1, 10.2, 12.4, 16.1, 17.1, 8.7.9.

<sup>101</sup>Martial 13.40.

vinegar and *Muria*<sup>102</sup>, and *σχороδάλμη*, a combination of *Garum* and garlic is also mentioned.<sup>103</sup> Horace refers to a combination of oil, wine, mackerel, vinegar and herbs.<sup>104</sup> A Pompeian *titulus pictus* records its contents as CICER / HAL[lex], seemingly a combination of *Hallec* with chick-peas.<sup>105</sup> Wine seems to have been a popular ingredient in fish sauce: the *Geoponica* notes that wine was sometimes added to sauces by the Bithynians<sup>106</sup> and the *Garum* recipe of Ps.-Rufius Festus includes three sextarii of wine for every sextarius of salted fish<sup>107</sup>, although in this case the sauce is merely specified as *Garum*. We have no evidence that these sauces were ever traded with no extant record of them upon *tituli picti* or within the archaeological record<sup>108</sup>, and it is unclear as to whether the mixing occurred at the hands of the producer, the buyer or the intermediate merchant. The incidence of *dolia* within the excavated *Garum* shop at Pompeii may be a consequence of the mixing of particular recipes to meet the requirements of individual buyers.<sup>109</sup> Martial tells us that such mixtures could be prepared by the cook or brought over the counter.<sup>110</sup> The Eighth-Ninth Century *Garum* recipe of Ms. Lat. 11219<sup>111</sup> provides for the inclusion not only of fish and salt within the

<sup>102</sup>Oribasius *Synopsis ad Eustathium* 4.8.1, *Ad Eunapium* 1.25.1, 3.67.1, 3.69,3.70.2; Galen *De Alimenterum Facultatibus* 2.57; Cratinus *Odyseuses* frg 143 Edmonds.

<sup>103</sup>Cratinus *Odyseuses* frg 143 Edmonds.

<sup>104</sup>Horace *Satires* 8.44-54: "The ingredients of the sauce are these: oil from Venafrum of the first pressing, roe from the juices of the Spanish mackerel, wine five years old, but produced this side of the sea, poured in while it is on the boil- after boiling, Chian suits better than anything else- white pepper, and vinegar made from the fermentng of Lesbian vintage. I was the first to point out that one should boil in the sauce green rockets and bitter elecampane; Curtillus would use sea-urchins, unwashed, inasmuch as the yield of the sea-shellfish is better than a briny pickle." 2.4.63-6: "It is worth while to study well the nature of the compound sauce. The simple consists of sweet olive oil, which should be mixed with thick wine and with brine, such as that of which your Byzantine jar smells so strong. When this, mixed with chopped herbs, has been boiled, and, after being sprinkled with Corycian saffron, has been left to stand, you are to add besides more of the juice yielded by the pressed berry of the Venafran olive." (trans. Loeb ed.).

<sup>105</sup>CIL iv.5728.

<sup>106</sup>*Geoponica* 20.46.4: τινες δὲ καὶ οἴνου ἐμβάλλουσι παλαιοῦ εἰς τὸν ξέστην τῶν ἰχθύων ξέστας Β'. "Some add to one *sextarius* of fish, two *sextarii* of old wine."

<sup>107</sup>Ps.-Rufius Festus *Brevarium*: *et mitte ex illis sextarium unum et de bono vino sextarios tres...* "Put one *sextarius* of these, and three *sextarii* of good wine..."

<sup>108</sup>The exception is the CICER/HAL[lex] referred to above from Pompeii.

<sup>109</sup>cf Curtis, R I (1979) op. cit. n. 42 p 5-23. The *dolia* seem originally to have contained wine with one bearing the graffito V(inum) R(ubrum)- perhaps an indicator of the sauce mixtures prepared here.

<sup>110</sup>Martial 7.27.7-8.

<sup>111</sup>Ms. Lat. 11219 (Curtis, R I (1991) op. cit. n. 31 app. 1.7): *Confectio ad garum faciendum. pisces mundos partes duos, sal partem unam, anetum partem unam; et agitas eum bene de die in diem: et de herbas quas ibidem mittere debes siccis, ad coquendum haec sunt: anetum manipulos duos, menta manipulos quattuor; nepita sclareia, organpo, satureia, ambrosia, serpullo, fenogreco, de uniuoque manipulos II; et de herbis virides: cassia, salvia, savina, iva, ruta, abrotano, costo ortense radices,*

sauce but also herbs, fruit, nuts, wine and honey. The adulteration of fish sauces to meet individual requirements and recipes will no doubt have been a common phenomenon. Some of the more popular recipes will have been available over the counter but others must have been produced in the kitchens of their owners and their production must have been located in relation to their consumption rather than to the factories involved in the preparation of the original sauce. What ever shipment was involved will have taken place in the guise of the original sauce. Thus as a consequence more of the culinary preparation and consumption of the sauces than their production these mixed sauces were destined for purely local consumption without becoming objects of trade and thus featuring in the archaeological record. Even so it is apparent that sauces such as *Garum* could include ingredients such as wine and a number of *tituli* appear to record the exchange of specific recipes. Fausto Zevi has suggested that the *Garum Hispanum* and *Muria Hispana* recorded on *tituli picti* from Augst<sup>112</sup> do not in fact represent sauces of an Hispanic origin but rather a sauce produced to a Spanish recipe.<sup>113</sup> However, their presence upon Dr 7-11 vessels originating from either Baetica or Cataluña points to a Spanish origin and Zevi's interpretation has received little currency.

A number of other products, such as *Lymphatum*<sup>114</sup> which may be related to *Hydrogarum* as a form of fish sauce diluted with water<sup>115</sup>, *Laccatum* which seems to

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*livestici radices, fenuculi radices, lauri folia, geniperi grana, de uniuque fasciculos duos; citronia sextarios II, poma similiter; nuces gallicas similiter, panes asatos IIII, capiro radices puluera sextarios II, ad unoquoque modio de pisces, mustodilce modios II, ad coniectandum postea III, et mel sextarios II; et coquuis usque ad medium, ex tollis de foco, et mittis in sacco, et clarare facias, et postea mittis in vaso bene picatum, ut nullum suspirium habeat."* Recipe for making *Garum*. Two parts cleaned fish, one part salt, one part dill: and stir well from day to day: and as to the herbs which you ought to add to do the cooking, of the dried ones there are these: two handfuls of dill, four handfuls of mint; hardy catnip, oregano, savory, artemisia, thyme, fenugreek, of each two handfuls; and of green herbs: cinnamon, sage, savina, iva, rue, southernwood, roots of garden costus, roots of *livesticus*, roots of fennel, leaves of bay, seeds of *geniperum*, of each two small bunches; two sextarii of lemons and the same of apples; the same of Gallic nuts, four loaves, two sextarii of ground root of galigale, to every modius of fish, two modii of sweet new wine, with three to be added later, and two sextarii of honey; cook until half its original size, take off the fire and put in a bag and make it clear, and afterwards put in a well sealed pot, so that no air gets in."

<sup>112</sup>cf Bohn, O (1926) "Pinselschriften auf Amphoren aus Augst und Windisch" in *Anzeiger für Schweizerische Altertumskunde* 28 p 202 n. 2 G HISPAN associated with FRONTONISV; p 203 n. 4 MUR HISP. Both appear on Dr 7-11 amphorae.

<sup>113</sup>Zevi, F (1966) "Appunti sulle amfore Romane: I La tavola tipologica del Dressel" in *Archaeologia Classica* 18 p 232.

<sup>114</sup>CIL iv.5622: LYMP VET/AIIIA/XVIIIIS/M. VALERI HELIADIS; CIL iv.5615-5620; XV.4741.

have been a herbal mixture and may represent a composition of fish sauce with herbs<sup>116</sup>, *Largarinum*<sup>117</sup>, and a product identified by the abbreviation COD.<sup>118</sup> This is now generally taken as being an abbreviation of cordyla, a young tunny<sup>119</sup> - its association with the epithet ARG(utae)<sup>120</sup> may imply that it was produced and used in a similar fashion to the conventional fish sauces.<sup>121</sup> Although these products may have been related to fish sauces our knowledge of their characteristics is too scanty to permit any certainty.

Perhaps most immediately apparent from this discussion is the great deal of uncertainty and confusion that exists about the characterisation of the different types of fish sauce. There seems to have been a wide range of different sauces with variations in recipe not only between regions but all the way down to the individual preferences of cooks and consumers. With such individualism in the recipes of fish sauce it is impossible to define the empire-wide definition of all the names applied to different types of sauce. Even those that are well attested seem to have varied in meaning between different regions, individuals and periods of time. Because of their very success and ubiquity it is impossible for us to trace the myriad variations in the recipes and types of fish sauce, but I have attempted to ascertain some features of the more important types of fish sauce and before moving on it is perhaps worth briefly summarising the definitions of the sauces that we have expounded above.

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<sup>115</sup>cf Manacorda, D (1977) "Anfore Spagnole a Pompei" in *L'Instrumentum Domesticum di Ercolano e Pompei* (Rome) Quaderni di Cultura Materiale 1 p 127; Jardin, C (1961) "Garum et Sauces de poisson de l'antiquite" in *RSL* 27 p 85 associates *Lymphatum* with *Limpidum*.

<sup>116</sup>cf Zevi, F (1966) op. cit. n. 113 p 243. Herbs do, however, seem to have been a regular addition to *Garum* without requiring any separate designation- the recipe of *Ms. Lat.* 11219 records the inclusion of herbs within *Garum*, cf also Ps.-Gargilius Martialis 62. Despite incorporating herbs both recipes are entitled *Garum*. cf Manacorda, D (1977) op. cit. n. 115. Apuleius *De Medic. herb.* 4.12 describes *Laccatum* as a herbal mixture- unfortunately I have been unable to consult this source referred to by Manacorda, cf *CIL* iv.5645-6: LAC(catum) ARG(utum) VE(tus); iv.5640-3; xv.4733-4.

<sup>117</sup>*CIL* xv.4741.

<sup>118</sup>Bohn, O (1926) op. cit. n. 112 p 204 n° 7: COD VE[tus] on a Beltran I amphora from Augst; Lequement, R (1980) "Deux Inscriptions Peintes sur Amphores de Betique a Alesia" in *Revue Archeologique de l'Est et du Centre-Est* 31 p256-9 from Alesia: 1. COD ARG/EXCELL on Beltran IIB amphora. 2. COD PORT VET- for a list of locations at which the *titulus* COD appears, cf esp. p 257; Manacorda, D (1977) op. cit. n. 115 p 127 Callender, M (1965) *Roman Amphora* (London) has proposed the identification CO(n)D(itum).

<sup>119</sup>Pliny *NH* 9.18.1: *Coryla appelatur partus... et quum annum excessere tempus, thynni*.

<sup>120</sup>'Piquant', cf Lequement, R (1980) op. cit. n. 118.

<sup>121</sup>*Argutae* is also used to describe *Muria*, cf *CIL* iv.4723: MUR ARG/EXCE/FLOS CN.DOMITI FELI[c]IO[nis]. cf Zevi, F (1966) op. cit. n. 113 p 243.

Thus *Liquamen* seems to have been the most general of the terms being applied to a range of different liquids, but with regard to fish sauce, it seems to have been applied to the unadulterated mixture of fish and salt from which all other sauces were derived. As a partially processed fish sauce it lacked the strained purity of *Garum* and possessed poorer preservative qualities. Despite its poorer quality its similarity to *Garum* meant that it gradually came to be regarded as the Latin equivalent of the Greek γάρου, although as we have seen it seems not to have entirely lost its original wider meaning. *Garum*, on the other hand, seems to have been the most highly valued of the fish sauces being a pure liquid that Pliny says could even be drunk.<sup>122</sup> The residue left behind once the *Garum* has been drawn off is *Hallec*, a paste-like mixture of the undissolved remains of the fish. It was considered a second quality sauce and is unlikely to have been made independently of *Garum*. *Muria* appears to have been the brine solution used in the production and packing of salted fish. Evidently it acquired enough of the character of its associated meat to enable its use as a cheap condiment. Being a diluted sauce it had poorer preservative qualities than *Garum* and generally seems to have been of a lesser worth although some does attract notice for its quality, particularly that of Antipolis.

These sauces seem to have undergone varying amounts of adulteration at the hands of merchants and consumers to meet individual preferences and recipes. The more popular of these were probably available for purchase although they will have been for purely local consumption and are not attested as being traded. There seems to have been some overlap with more conventional sauces containing wine, herbs and other adulteration. Their use was probably widespread although their purely localised significance and lack of record means that their precise importance remains obscure.

Thus far we have attempted to characterise the different types of sauce without resort to the techniques of their production; it is to these, therefore, that we will now turn and it is hoped that a study of the ancient recipes for their manufacture will enable us to understand more fully the relationships between the different types of fish sauce.

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<sup>122</sup>Pliny *NH* 31.44.95: *Sicuti garum ad colorem mulsi veteris adeoque suavitatem ilutum ut bibi possit.* "Garum for instance has been blended to the colour of old honey wine, and to a taste so pleasant that it can be drunk." (trans. Loeb ed.).

## 2. LITERARY EVIDENCE FOR THE TECHNIQUES OF PRODUCING FISH SAUCES

In the course of the preceding discussion we referred to a number of sources that give some indication of the methods used in the manufacture of fish sauces. The maceration of the fish in salt and the maintenance of sufficiently high levels of salinity seem to have been the primary concerns. In this the processing involved seems to have varied little from that used in the preservation of other meats in which the meat was placed within a container interspersed with alternate layers of salt. The whole mixture is then pressed down with weights and allowed to ferment in the sun for several days during which the juices were expelled from the meat to mix with the salt and water to create a brine within which the meat was preserved.<sup>123</sup> Columella appears to state the similarity between the salting of meat and fish sauces: *eaque caro semper conservatur, et tanquam salsamentum in Muria sua permanet*<sup>124</sup> and it seems that there was a considerable overlap between the two, however, the processing of fish sauces was evidently sufficiently peculiar, or at least different to attract hostility from our literary sources.

The Elder Pliny states that fish sauces were made from the offal of the fish that could not be used in the making of *salsamentum*. This was immersed in salt- a process which he describes as putrefaction.<sup>125</sup> Evidently all parts of the fish could be used. A more complete description comes from the *Astronomica* of Manilius. Despite giving no more than a scanty and confused description of the processing of the sauces he does provide an account of the processing of the catch which may have been the norm at least within the tunny season. Firstly the tunny are caught in a network of nets where they are killed and the carcasses deposited along the shore. The fish are then cut up with different parts being used for different purposes: from part a choice liquid is

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<sup>123</sup>cf Columella *Re Rustica* 12.55.4; Cato *On Agriculture* 162. The process of salting meat is discussed more fully in Chapter 5.

<sup>124</sup>Columella *Re Rustica* 12.55.4: "and this flesh is always preserved, just as salt fish is preserved in its own liquid." cf appendix n. 29.

<sup>125</sup>Pliny *NH* 31.43.93: *Aliud etiamnum liquoris exquisiti genus, quod garum vocavere, intestinis pisium ceterisque quae abicienda essent sale maceratis, utsit illa putrescentium sanies.* "There is yet another kind of choice liquor, called *Garum*, consisting of the guts of fish and the other parts that would otherwise be considered refuse; these are soaked in salt, so that *Garum* is really liquor from the putrefaction of these matters." (trans. Loeb ed.).

drawn off which is flavoured with salt to provide a relish, possibly to be equated with *Garum*; in the other all the pieces of the corpse are blended together to form a less valuable condiment- this may be a reference to *Hallec* although Manilius provides no specific references to sauces in his account. He also refers to a second technique in which the fish are drawn from the water by nets and placed in large tanks where they decompose and blend together.<sup>126</sup> Manilius' description of the sauce as *illa putris turbae*

<sup>126</sup>Manilius *Astronomica* 5.565-81:

*Laeva sub extremis consurgunt sidera Ceti  
Piscibus Andromedan ponto caeloque squentis.  
hoc trahit in pelagi caedes ut vulnera natos  
squamigeri gregis, extentis laqueare profundum  
retibus et pontum vinclis artare furentis;  
et velut in laxo securas aequore phocas  
carceribus claudent raris et compede nectent  
incautosque trahent macularum nemine thynnos.  
nec cepisse sat est: luctantur corpora nodis  
exspectantque novas acies ferroque necantur,  
inficiturque suo permixtus sanguine pontus.  
tum quoque, cum toto iacuerunt litore praedae,  
altera fit caedis caedes: scinduntur in artus,  
corpore et ex uno varius describitur usus.  
illa datis melior, sucis pars illa retentis.  
hinc sanies pretiosa fluit floremque cruoris  
evomit et mixto gustum sale temperat oris;  
illa putris turbae strages confunditur omnis  
permiscetque suas alterna in damna figuras  
communemque cibus usum sucumque ministrat.  
aut, cum caeruleo stetit ipsa simillima ponto  
squamigerum nubes turbaque immobilis haeret,  
excipitur vasta circum vallata sagena  
ingentisque lacus et Bacchi dolia complet  
umorisque vomit socias per mutua dotes  
et fluit in liquidam tabem resoluta medulas.*

"On the left, as the last portion of the fishes rises, appears in the constellation of the Whale, pursuing Andromeda in heaven as on the sea. This monster enlists its sons in an onslaught on the deep and a butchery of scaly creatures; theirs will be a passion for ensnaring the deep with nets spread wide and for straitening the sea with bonds; they will confine in spacious prisons seals which deem themselves as safe as in the open sea and shackle them fast in fetters; the unwary tunny they will draw along a network of meshes. And their capture is not the end: the fish struggles against their bonds, awaiting new assaults, and suffer death by the knife; and the sea is dyed, mixed with blood of its own. Furthermore, when the victims lie along the shore a second slaughter is perpetrated on the first; the fish are torn into pieces, and a single body is divided to serve separate ends. One part is better if its juices are given up, another if they are retained. In the one case a valuable fluid is discharged, which yields the choicest part of the blood: flavoured with salt, it imparts a relish to the palate. In the other case all the pieces of the decaying carcass are blended together and merge their shapes until every distinguishing feature has been lost: they provide food with a condiment of general use. Or when, presenting the very likeness of the dark-hued sea, a shoal of the scaly creatures has come to a stop and cannot move for their numbers, they are surrounded and drawn from the water by a huge dragnet, and

*strages confunditur omnis permiscetque suas alterna in damna figuras communemque cibis usum succumque ministrat* recalls that of the Elder Pliny and Seneca<sup>127</sup> as well as the association of fish sauce with their ingredients as the fermented remains of fish.

Despite the paucity of Manilius' account, a number of later texts provide fuller accounts of the production of fish sauce, and it is from these that we are able to provide a fairly complete account of the two methods of producing fish sauce; although the authenticity of the texts themselves may be open to doubt, the similarities in fish sauce production throughout the period of its consumption make the recipes contained within them applicable to both the Roman and Medieval periods. Appended to a Ninth or Tenth Century manuscript of the *De Medicamentis* of Gargilius Martialis (Third Century AD) is a recipe for the production of *Garum*. The appearance of the Medieval term 'aringus' has led to the recipe led to the being ascribed to Medieval intrusion.<sup>128</sup> The text describes the placing of layers of herbs, spices, fish and salt in a container and then left in the sun to ferment for twenty-seven days being stirred regularly. The sauce was then drained and bottled:

*Confectio liquaminis quod oenogarum vocant*

*capiuntur pisces natura pingues, ut sunt salmones et anguillae et alausae et sardinae vel aringi, et fit ex eis atque ex herbis odoratis aridis cum sale compositio talis. praeparatur vas bene solidum ac bene picatum capax trium vel quattuor modiorum, sumunturque herbae aridae bene olentes tam de horto quam de agro, utputa anetum coliandrum feniculum apium satureia sclareia ruta menta sisymbrium ligusticum puleium serpullum origanum vettonica argemonia, et ex his in fundo vasis primus ordo consternitur. tum ex piscibus si minores fuerint integris, si maiores in frusta concisis alter ordo componitur. super hunc tertius ordo salis binos digitos altus adicitur. atque in hunc modum his tribus herbarum et piscium*

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fill large tanks and wine-vats; their common endowment of liquid is exuded upon each other, for their inward parts melt and issue forth as a stream of decomposition." (trans. Loeb ed.).

<sup>127</sup>Pliny *NH* 31.43.93; Seneca *Epistle* 95.25: *illud sociorum garum, pretiosam malorum piscium saniam, non credis urere salsa tabe praecordia?* "Do you not think that the so-called 'Sauce from the Povinces', the costly extract of poisonous fish burns up the stomach with its salted putrefaction?" (trans. Loeb. ed.).

<sup>128</sup>cf Curtis, R I (1984) op. cit. n. 39.

*salisque ordinibus supra in vicem alternantibus vas est usque ad summitatem implendum. quibus transactis per continuous viginti dies cottidie bis vel ter palo ligneo in modum remi formato compositio ista usque ad fundum est commovenda. quibus expletis liquor qui de hac compositione defluxit colligitur. atque in hunc modum ex eo liquamen vel oenogarum conficitur. sumuntur huius liquoris sestarii duo et cum dimidio boni vini sestario commiscentur, tum quattuor herbarum aridarum singuli manipuli in hanc mixturam coiciuntur, aneti videlicet et coliadri et satureiae atque sclareiae. feni graeci quoque seminis pugillus unus adicitur, et de aromatibus piperis grana triginta vel quadraginta, costi pondo denarii tres, cinnami similiter, caryophylli similiter. haec minute condita eidem liquori permiscentur. tum vel in ferreo vel in aereo vase compositio haec tam diu coquenda est quousque ad unius sestarii mensuram perveniat. prius tamen quam percoquatur mellis despumati selibram in eam adici oportet. quae cum percocta fuerit more potionum per saccum colari debet usque ad claritatem, fervens tamen sacco infundenda est. eliquata vero et refrigerata in vase bene picato servatur ad obsonia condienda.<sup>129</sup>*

This process seems to have been a gradual one and in its use of herbs recalls that of Ms. Lat. 11219, although this recipe appears to be confused referring both to the gradual process as well as to a second technique involving the application of artificial heat to the mixture.<sup>130</sup> The recipe, although combining the two techniques of production, refers to the cooking of the sauce until half its original size. A similar

<sup>129</sup>Ps.-Gargilius Martialis 62, cf Rose, V (1874) op. cit. n. 40, Curtis, R I (1991) op. cit. n. 31 app. 1.5.

<sup>130</sup>Ms. Lat. 11219: *Confectio ad garum faciendum. pisces mundos partes duos, sal partem unam, anetum partem unam; et agitas eum bene de die in diem: et de herbas quas ibidem mittere debes siccis, ad coquendum haec sunt: anetum manipulos duos, menta manipulos quattuor; nepita sclareia, origanpo, satureia, ambrosia, serpullo, fenogreco, de uniuoque manipulos II; et de herbis virides: cassia, salvia, savina, iva, ruta, abrotano, costo ortense radices, livestocki radices, fenuculi radices, lauri folia, geniperi grana, de uniuoque fasciculos duos; citronia sextarios II, poma similiter; nuces gallicas similiter, panes asatos IIII, cipiro radices pulvera sextarios II, ad unoquoque modio de pisces, mustodilce modios II, ad coniectandum postea III, et mel sextarios II; et coquus usque ad medium, ex tollis de foco, et mittis in sacco, et clarare facias, et postea mittis in vaso bene picatum, ut nullum suspirium habeat.*

process is preserved in a single manuscript of the Breviarium rerum gestarum populi Romani of Rufius Festus (Fourth Century AD), in which the mixture of salt and fish is cooked in a bronze pot until it had reduced by two-thirds after which the mixture was strained and bottled.<sup>131</sup>

Thus we see the operation of two techniques of producing fish sauce: the first a long term process which seems to be the equivalent of Dry-Salting in which the sauce is fermented by means of exposure to the sun; and a second, a technique of Brining, in which the fermentation is hastened by means of artificial heat. Both these recipes are described in a chapter entitled Γάρων ποιησις from the Tenth Century Greek Geoponica which provides the fullest description of Garum production and is worth quoting here:

#### Γάρων ποίησις

1) Το χαλούμενον λικουάμεν οὕτω γίνεται. τὰ ἔγκατα τῶν ἰχθύων βάλλεται εἰς σκεῦος, καὶ ἀλίζεται. καὶ λεπτὰ ὀψαρίδια, μάλιστα δὲ ἄθερνα, ἢ λεπτὰ τριγλία, ἢ μαινίδια, ἢ λυκόστομοι, ἢ ὁ ἄν δόξη λεπτὸν εἶναι, πάντα ὁμοίως ἀλίζεται, καὶ ἐν ἡλίῳ ταριχεύεται πυκνῶς δονούμενα. 2) ὅταν δὲ ταριχευθῇ τῇ θερέῃ, ἐξ αὐτῶν γάρως οὕτως αἴρεται. κόφινος μακρὸς πυκνὸς ἐντίθεται εἰς τὸ μεστὸν ἀγγεῖον τῶν προειρημένων ὀψαρίων, καὶ εἰσρεῖ τὸ γάρως εἰς τὸν κόφινον, καὶ οὕτω διὰ τοῦ κοφίνου διηθηθὲν τὸ καλούμενον λικουάμεν ἀναιροῦντα. τὸ δὲ λοιπὸν πάτημα γίνεται ἄλιξ. 3) Βιθυνοὶ δὲ κατασκευάζουσιν οὕτως. λαμβάνεις κάλλιον μὲν εἰ μαινίδας μικρὰς ἢ μεγάλας, εἰ δὲ μὴ, λυκοστόμους, ἢ σαύρους, ἢ σκόμβρους, ἢ καὶ ἄλικά, καὶ πάντων μίγμα, καὶ βαλεῖς αὐτὰ εἰς μαγίδα ἀρτοκοπικὴν, ἐν ἣ εἰώθασι φυρᾶν τὸ ἄλευρον, καὶ εἰς τὸν μόδιον τῶν ἰχθύων ἀλὸς ξέστας βΐταλικούς βαλὼν ἀναφύρασον, ὡς συγκραθῆναι τοῖς ἄλσι. καὶ ἔασας ἐπὶ νύκτα μίαν βάλει ἐπὶ

<sup>131</sup>Ps.-Rufius Festus Breviarum: *Confectio gari. sume pisces minores salsos aut si salsi non fuerint, saliantur pauco sale. et mitte ex illis sextarium unum et de bono vino sextarios tres et coque in aereo vase usque dum duca partes consumantur et tertia remaneat. tum cola per saccum usque ad claritatem et refrigera. tum mitte in vitream ampullam et utere.*

κεράμιον, ἀπώμαστον τε τίθει ἐν ἡλίῳ ἐπὶ μῆνας β' ἢ γ', δονῶν αὐτὸ ῥάβδῳ ἐχ διαστημάτων, εἶτα λαβὼν καὶ πωμάσας ἀποτίθεσο. 4) τινὲς δὲ καὶ οἴνου ἐμβάλλουσι παλαιοῦ εἰς τὸν ξέστην τῶν ἰχθύων χέστας Β'. 5) Εἶτα εἰ βούλει εὐθέως χρήσασθαι τῆ γάρῳ, τουτέστι [τοῦ] μῆ ἡλιάσαι αὐτό, ἀλλ' ἐψησαι, ποιμίσεις οὕτως. ἄλμης στακτῆς δεδοκιμασμένης, οὕτως ὡς ὠν ἐμβληθὲν ἐπιπλεῖν (εἴαν δὲ βυθίζεται, οὐπὼ ἔχει ἄλας τὸ ἀρκουῖν), εἶτα βαλὼν εἰς τὴν ἄλμην τὸν ἰχθῦν ἐν κύθρα καινῇ, καὶ ἐμβάλων ὀριγάνου, ἐπιτίθει πυρὶ αὐτάρκει, ἕως ἂν ἐψηθῇ, τουτέστιν ἕως ἂν ἄρξῃται κἂν ὀλιγον ἀποποιεῖν. τιπὲς καὶ ἔψημα προσβάλλουσιν. εἶτα ψυχθὲν βαλὼν εἰς ὑλιστῆρα δεύτερον καὶ τρίτον ἐπίρριπτε τὸ αὐτὸ τῷ ὑλιστῆρι, ἕως ἂν καθαρὸν ἐκβῇ. καὶ πωμάσαφ ἀποτίθεσο. 6) Τὸ δὲ κάλλιον γάρος, τὸ καλούμενον αἰμάτιον, οὕτω γίνεται. λαμβάνεται τὰ ἔγκατα τοῦ θύννου μετὰ τῶν ἐμβραγχιων καὶ τοῦ ἰχῶρος καὶ τοῦ αἵματος, καὶ πᾶσσεται τὸ ἀρκουῖν ἄλας. ξαὶ ἕασας ἐν τῷ ἀγγεῖῳ [καὶ] μετὰ μῆνας β' τὸ πολὺ, τρυπᾶς τὸ ἀγγεῖον, καὶ ἐξέρχεται γάρος τὸ καλούμενον αἰμάτιον.<sup>132</sup>

<sup>132</sup>Geoponica 20.46.1-6: "1. The so-called liquamen is made in this manner; the intestines of fish are thrown into a vessel and salted. Small fish, either the best smelt, or small mullet, or sprats, or wolffish, or whatever is deemed to be small, are all salted together and, shaken frequently, are fermented in the sun. 2. After it has been reduced in the heat, garum is obtained from it in this way: a large, strong basket is placed into the vessel of the aforementioned fish, and the garum streams into the basket. In this way the so-called *liquamen* is strained through the basket when it is taken up. The remaining refuse is *altec*. 3. The Bithynians prepare it in this manner; It is best if you take small or large sprats, but if not, wolffish, or horse-mackerel, or mackerel or even alicia, and a mixture of all, and throw these into a baker's kneading trough, in which they are accustomed to knead meal. Tossing into the modius of fish two Italian *sextarii* of salt, mix up thoroughly in order to strengthen it with salt. After leaving it alone for one night throw it into a vessel and place it without a lid in the sun for two or three months, agitating it with a shaft at intervals. Next take it, cover it, and store it away. 4. Some add to one *sextarius* of fish, two *sextarii* of old wine. 5. Next, if you wish to use the *garum* immediately, that is to say not to ferment it in the sun, but to boil it, you do it in this way. When the brine has been tested, so that an egg having been thrown in floats (if it sinks, it is not sufficiently salty), and throwing the fish into the brine in a newly-made earthenware pot and adding in some oregano, you place it on a sufficient fire until it is boiled, that is until begins to reduce a little. Some throw in boiled down must. Next, throwing the cooled liquid into a filter you toss it a second and a third time through the filter until it turns out clear. After having covered it, store it away. 6. The best *garum*, the so-called haimation, is made in this way: the intestines of tunny along with the gills, juice and blood are taken and sufficient salt is sprinkled on. After having left it alone in the vessel for two months at most, pierce the vessel and the garum called haimation, is withdrawn." (trans. Curtis, R I (1991) op. cit. n. 31).

First, by the slow recipe, the intestines of the fish was placed in a container with salt and then left in the sun to ferment for two to three months. Once the mixture had been reduced by the heat it was strained to separate the constituent *Garum* and *Hallec*. This technique is evidently that employed by the Bithynians who also added wine. The second recipe was a quicker one whereby the fish is placed into a strong brine and then brought to the boil over a fire until the mixture begins to reduce; Must or herbs can be added. Finally the mixture is repeatedly strained to leave a clear liquid sauce. It appears, however, that the highest quality sauce was produced by the longer term recipe and was strained off as a liquid from the salt-fish mixture.

As with *Salsamentum*, the primary concern was the maintenance of sufficient levels of salinity. There seems not to have been any specific duration for the fermentation of the sauce: Cato's description of mild curing meat<sup>133</sup> allows only twelve days for the salting of the meat although most recipes envisage a longer period of time: the *Geoponica* states that the best *Garum* was fermented in the sun for a period of up to two months.<sup>134</sup> Similarly the slower recipes of Ps.-Gargilius Martialis and the *Geoponica* will have taken some time: the former recording that the salt-fish mixture should be left in the sun for twenty-seven days, whilst the latter states that the sauce is left to ferment in the sun for two to three months. Rather than relying upon periods of time, the more regular method seems to have been based upon the scale of reduction as an indication of its readiness. Rufius Festus states that the sauce should be cooked until it has reduced by two-thirds, whilst the recipe of *Ms. Lat.* 11219 recommends that the sauce should be cooked until it is half its original size.

Although the absorption of the brine and thus the reduction of the meat being salted was considered important, particularly with regard to methods of brining with the artificial heating of sauces, the salinity of this brine and of the mixture as a whole was the major concern to prevent the onset of putrefaction. Cato tells us that to salt hams, one *modius* of salt should be added to each ham<sup>135</sup>, elsewhere he states that one and a

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<sup>133</sup>Cato *On Agriculture* 162, cf appendix.

<sup>134</sup>*Geoponica* 20.46.6.

<sup>135</sup>Cato *On Agriculture* 162.

half pounds of salt is needed to produce a brine of sea water.<sup>136</sup> Both Columella and Cato describe the creation of a brine mixture: firstly a vessel is filled with fresh water into which a basket containing salt is placed. As the salt is absorbed by the water over several days further salt is added until the water has become saturated. To ascertain its readiness a piece of fresh cheese, a boiled egg or a fresh fish are placed within the brine, if they float it is ready, if they sink the salinity of the mixture is still insufficient.<sup>137</sup> It is in this regard that Cato states that such brines were used for the salting of meat, cheese and fish: *ea muries erit, vel carnem vel caseos vel salsamenta quo condas*. This process recalls that of the Geoponica for the production of fish sauce. In both recipes the emphasis is placed upon the use of sufficient quantities of salt, with the Geoponica recommending the sauce be cooked in a brine that has to be strong enough to float an

<sup>136</sup>Cato On Agriculture 106: "Preparation of sea-water: Take one *quadrantal* of water from the deep sea where no fresh water comes; parch one and a half pounds of salt, add it, and stir with a rod until a boiled hen's egg will float; then stop the stirring. Add two *congi* of old wine, either Aminian or ordinary white, and after mixing thoroughly pour into a pitched jar and seal. If you wish to make a larger quantity of sea-water, use a proportionate amount of the same materials." (trans. Loeb ed.).

<sup>137</sup>Columella Re Rustica 12.6: *Muriam sic facito: dolium quam patentissimi oris locato in ea parte villae, quae plurimum solis accipit. Id dolium aqua caelesti repleto; ea est enim huic rei aptissima; vel si non fuerit pluvalis, certe fontana dulcissimi saporis. Tum indito sportam uinceam, vel sparteam, quae replenda est sale candido, quo candidior muria fiat. cum salem per aliquot dies videbis liquescere, ex eo intelliges nondum muriam esse maturam. Itaque subinde alium salem tamdim ingeres, donec in sporta permaneat integer, nec minuatur. Quod cum animadverteris scias haberemuriam maturitatem suam. Et si facere aliam voveris, hanc in vasa bene picata diffundes, et opertam in sole habebis. Omnem enim mucorem vis solis aufert, et odorem bonum praebet. Est et aliud muriae matura experimentum. Nam ubi dulcem caseum demiseris in eam, si pessum ibit, scies esse adhuc crudam: si innabit, maturam.* "The following is the way to make hard brine. Place a jar with as wide a mouth as possible in the part of the farmhouse which gets the most sun. Fill the jar with rain-water, for this is the most suitable for the purpose, or, if rain-water is not available, let it be at any rate spring water of very sweet flavour. Then place in the water a basket made of rushes or of broom which must be filled with white salt, so that the brine may be whiter. When in the course of several days you see the salt continues to melt, you will know from this fact the brine is not yet ready. You will, therefore, put in more salt from time to time until it remains unchanged in the basket and does not grow less. When you notice that it does so, you can be sure that the brine has come to maturity. And if you wish to make more brine, you will pour the brine already made into vessels well daubed with pitch and keep it covered up in the sun; for the action of the sun takes away all mustiness and causes a pleasant odour. There is also another method proving that the brine is ripe; for, when you plunge a piece of fresh cheese into it, if it sinks to the bottom, you will know that it is still crude, but if it floats on the surface, you will know that it has reached maturity." (trans. Loeb ed.). cf also Cato On Agriculture 88: *Salem candidum sic facito. Amphoram defracto collo puram inpleto aquae purae, in sole ponito. Ibib fiscellam cum sale populari suspendito et quassato suppletoque identidem. Id aliquotiens in die cotidie facito, usque adeo donec sal desiverit tabescere biduum. Id signi erit: menam aridam vel ovum demittito; si nabit, ea muries erit, vel carnem vel caseos vel salsamenta quo condas.* "Recipe for bleaching salt: Break off the neck of a clean amphora, fill with clear water, and place in the sun. Suspend it in a basket filed with common salt and shake and renew from time to time. Do this daily several times a day until the salt ceases to dissolve for two days. You can find when

egg.<sup>138</sup> For every modius of fish two sextarii of salt are added being well mixed to ensure the complete impregnation of the fish with salt. This gives a salt to fish ratio of 1:8- the sheer quantity of salt required to produce fish sauce will be discussed more fully later in this thesis. The importance attached to the high level of salinity meant that salt, along with fish, was the primary ingredient of these fish sauces and that a plentiful supply was a necessity. Salt in the quantities expressed by the sources was able to retard the decomposition of the fish. In view of the rapid deterioration that occurs in the flesh of fish following their death, the period of time between their catch and subsequent salting had to be short to ensure a degree of freshness. By immersing the fish within salt degradation occurs resulting in the creation of a sauce: if the length of time and quantity of salt is small then the result is *Salsamentum*, salted fish, if the amount of time is lengthened and the salinity increased then increased osmosis occurs resulting in fish sauce. It is to this undifferentiated salt-fish mixture that the term *Liquamen* was applied. This technique is that used in the slower recipes of Gargilius Martialis and the *Geoponica*. By using a brine, however, the absorption of the salt by the fish tissue is hastened and this is the primary concern of the more rapid processing of fish sauce described by Rufius Festus. The process of osmosis leads to the dilution of the brine making the repeated addition of salt a necessity. Similarly the placement of alternate layers of salt and fish within vats assured the immersion of the fish whilst the use of weights hastens osmosis and prevents oxidation. The degree of salting required governs the period of ripening which ranges from a couple of weeks to several months. In order to counteract the variation in levels of salting between the different parts of the vat greater quantities of salt are placed at the top of the vat.

This dry-salting within vats is most applicable to the processing of large quantities of fish and thus seems to have been most evident in the Roman fish factories. It would have been necessary at least to meet the quantities of fish available during the tunny season and such vats are the principal evidence for the existence of fish salteries. Brining is less capable of processing large quantities of fish; although more rapid it is more small scale in application and does not seem to have been as widespread as dry-

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it is saturated by this test: place a small dried fish or an egg in it, and if it floats you have a brine strong enough to pickle meat or cheese or salted fish." (trans. Loeb ed.).

<sup>138</sup>*Geoponica* 20.46.3.

salting. The relative importance of the two may, however, be misleading as brining is less readily detectable within the archaeological record as it took place in *dolia* or other such pottery vessels which are less readily associatable with such activities than rock-cut vats. Thus brining may have been more widespread within urban and villa contexts where smaller quantities will have been required for personal consumption, although dry-salting will have been the principal process operating within fish salteries.

Both techniques are still employed today in the production of salt fish in various parts of the world, most notably in the Far East, Greece and Turkey.<sup>139</sup> Although none of these sauces are attested within modern Spain, salted fish does still feature within the local diet of the Eastern provinces of Alicante and Valencia, principally a type of tunny preserved in brine known as 'tonyina de sorra'. Anchovies and a type of dried white fish called 'capellanets' are also consumed. Although we will discuss the evidence for the fish salteries of Alicante later in this thesis we must draw attention here to Gabriella Martin's suggestion that these local delicacies represent a survival of a local indigenous Valencian tradition of preserving fish within the Roman period.<sup>140</sup> Citing the homogeneity of the Alicantean fisheries and their difference from the industrial complexes of Baetica and North Africa, Martin suggests that the reason for these differences lay in part with the production within Alicante of sauces other than *Garum*, *Muria*, *Liquamen* or *Hallec*. In this regard she adds the presence of Pelichet 47 amphorae within the coastal waters of Alicante which appear to have brought fish sauces from Baetica- although we do not know the eventual destination of such. More shall be said of the question of amphorae and the characteristics of the fisheries in the region and I shall not repeat it here, suffice it to say that there is no evidence that the differences between the factories of the East Coast and those further South were based on the production of sauces other than *Garum* and there is no evidence for such within the factories themselves. On the contrary, *Garum Sociorum* is attested from Carthago Nova and *Muria* from Barcino<sup>141</sup> which, in view of the interdependence of the four

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<sup>139</sup>cf Curtis, R I (1991) op. cit. n. 31 p 15-26; Grimal, P and Monod, Th (1952) op. cit. n. 31 p 27-38.

<sup>140</sup>Martin, G and Serres M<sup>a</sup> D (1970) *La Factoria pesquera de la Punta de l'Arenal y otros restos romanos de Javea (Alicante)* in TV del SIP 38 (Valencia) p 83-6.

<sup>141</sup>*Muria Barcionensis*: Ausonius *Epistle* 25: *veritus displicuisse oleum, quod miseris, munus iterati, addito etiam Barcinoensis muriae condimento cumulatius praetitisti*. "Fearing that the oil you sent had not given satisfaction, you repeat the gift and, by the addition of some Barcelona sauce called *muria*, increase its measure." (trans. Loeb ed.) *Garum Sociorum*: Pliny *NH* 31.43.93: *nunc e scombro pisce*

principal sauces, makes it reasonable to suppose that *Garum*, *Muria*, *Liquamen* and *Hallec* were produced within the region. the differences between the fish factories of Alicante and elsewhere are based not upon the production of a specific local alternative to *Garum* but upon the different economic background of the industry between Tarraconensis and Baetica.

### 3. ANCIENT EVIDENCE FOR THE MERITS AND USES OF FISH SAUCE

Although the most superficial reading of the *De Re Coquinaria* of Apicius should show the popularity of *Garum* as a condiment in Roman cuisine, the high salinity of fish sauces, their composition from the offal of fish and association with its putrefaction combined to create a hostile impression within our literary sources.

The Elder Pliny's description of fish sauce shows this bias by emphasising its composition from the parts of fish that would otherwise be wasted and that its production from putrefied fish.<sup>142</sup> This view is reiterated by Seneca when he asks: *Quid? Illud sociorum Garum, pretiosam malorum piscium saniem, non credis urere salsa tube praecordia?*<sup>143</sup> Even Manilius' portrayal of the processing of fish is tainted by his graphic descriptions of its rotten character.<sup>144</sup> Similar ridicule can be found in the Greek sources: the Comedic playwright Plato writing in the late Fifth Century BC

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*laudatissimum in Carthaginis Spartariae cetariis- sociorum id appellatur- singulis militibus nummum permutantibus congios fere binos. nec liquor ullus paene praeter unguenta maiore in pretio esse coepit; nobilitatis etiam gentibus.* "Today the most popular *garum* is made from the scomber in the fisheries of Carthago Spartaria- it is called *garum* of the allies- one thousand sesterces being exchanged for about two *congi* of the fish. Scarcely any other liquid except unguents has come to be more highly valued, bringing fame even to the nations that make it." (trans. Loeb ed.). Strabo *Geography* 3.4.6: Κάνταυθα δὲ αἰ ἐν τοῖς πλησίον τόποις πολλὴ ἢ ταριχεῖα..... εἶθ' ἢ τοῦ Ἡρακλέους νῆσος ἤδη πρὸς Καρχηδόνι, ἣν καλοῦσι Σκομβραρίαν ἀπὸ τῶν ἀλισκο μενων σκόμβρων, ἐξ ὧν τὸ ἀρίστον σκευάζεται γάρως, Ptolemaeus 11-6.14; Athenaeus *Deipnosophistae* III.121: τραβῶν δ' ἐν γ Γεωγραφικῶν πρὸς ταῖς Ἡρακλέους φησι νηδοὺς κατὰ Κάρχηδονα τῆν καίνην πόλιν εἶναι Σεξιτανίαν, ἐξ ἧς καὶ τὰ ταριχη ἐπωνυμῶς λεγέσθαι, καὶ ἄλλην Σκομβροάριαν ἀπὸ τῶν ἀλισκόμενων σκόμβρων, ἐξ ὧν τὸ ἀρίστον σκευάζεται γάρως.

<sup>142</sup>Pliny *NH* 31.34.93: *Aliud etiamnum liquoris exquisiti genus, quod garum vocavere, intestinis piscium sanies.*

<sup>143</sup>Seneca *Epistle* 95.25: "What? Do you not think that the so-called 'Sauce from the Provinces'; the costly extract of poisonous fish, burns up the stomach with its salted putrefaction?" (trans. Loeb ed.). cf also Horace *Satires* 2.4.66: "just as if someone were were anxious only that his wines be good, but cared not what oil he poured upon his fish." (trans. Loeb ed.).

<sup>144</sup>*Astronomica* 5.679-81: *complet umorisque vomit socias per mutua dotes et fluit in liquidam tabem resoluta medulas.* "their common endowment of liquid is exuded upon each other, for their inward parts melt and issue forth as a stream of decomposition." (trans. Loeb ed.).

(c425-390 BC), could exclaim *σᾶπρῶ γὰρῶν βαπτῶντες αποπνιξοῦσι με*<sup>145</sup>, whilst Artemidorus comments that it was no more than putrefaction.<sup>146</sup> The most widespread use of fish sauce, however, comes from the satires of Martial. Such was the notoriety of *Garum* that he could express amazement at a certain Flaccus for maintaining amorous advances towards a woman who had just eaten six helpings of fish sauce<sup>147</sup>, whilst elsewhere he criticises Baeticus' taste for *Hallec* and includes it in a catalogue of rotten foods.<sup>148</sup> To the Fourth Century writer Macrobius, reference to fish sauce and *Salsamentum* was seen to be derogatory, with the more explicit the reference the more offensive the meaning.<sup>149</sup>

The ridicule in which fish sauces were held can be summed up by a graffito scratched on the wall of the Caserma dei Gladiatori in Pompeii (Regio v.v.3)<sup>150</sup>. The graffito concerns the gladiator Lucius Asicius; in a play on the word 'murmillo', he is likened to *muriola*, a sweet drink associated with women, and to the fish sauce *Muria*. Such criticism is based upon the effeminate connotation of *muriola* and the notoriously foul-smelling *Muria*. The strong odour of fish sauces is commonly referred to by the literary sources. Horace describes *Muria* as possessing a strong smell<sup>151</sup>, whilst Pliny appears to associate its unpleasant smell with its salty character.<sup>152</sup> Elsewhere the same

<sup>145</sup>Plato apud. Athenaeus 2.67c [π.γάρος]: "They'll dip me in rotten fish pickle and drown me!" trans. Edmonds, J M (1957) *The Fragments of Attic Comedy* vol. 1 (Leiden).

<sup>146</sup>Artemidorus *Onirocriticon* 5.1.66: ἔστι γὰρ οὐδὲν ἄλλο ὁ γάρος ἢ σηπεδῶν. (trans. Curtis, R I (1983) "In defense of Garum" in *Classical Journal* 78 p 232).

<sup>147</sup>Martial 11.27: *Ferreus es, si stare potest tibi mentula Flacce cum te sex cyathos orat amica gari.*

<sup>148</sup>Martial 3.77.

<sup>149</sup>Macrobius *Saturnalia* 7.3.6: *est autem leodoria huius modi: oblitusne es quia salsamenta vendebas? scomma autem, quod diximus saepe contumeliam esse celatum, tale est: meminimus quando brachio te emungebas. nam cum res eadem utrobique dicta sit, illud tamen leodria est, quod aperte oliectum exprobratumque est, hoc scomma, quod figurate.* cf Curtis, R I (1990) "The Man who wipes his nose on his shirt sleeve" in *Laverna* 1 p 1-12.

<sup>150</sup>*CIL* iv.4287; cf also Curtis, R I (1980) "A slur on Lucius Asicius, the Pompeian Gladiator" in *TAPA* 110 p 51-61: EDICTUM M.ATI PRIMI/SI QUI(s) MURIA(m)/BONA(m) VOLET/PETAT A L.ASICIO/...BUS MU.../SCITO MURIOLA ES/IESUS.

<sup>151</sup>Horace *Satires* 2.4.63-6: *Est operae pretium duplicis pernoscere iuris nauram. simplex e dulci constat olivo, quod pingui miscere mero muriaque decebit non alia quam qua Byzantia putuit orca.* "It is worth while to study the nature of the compound sauce. The simple consists of sweet olive oil, which should be mixed with thick wine and brine, such as that of which your Byzantine jar smells so strong." (trans. Loeb ed.).

<sup>152</sup>Pliny *NH* 31.42.90: *appellatur et flos salis in totum diversa res umidiorisque naturae et crocei coloris aut rufi, veluti rubigo salis, odore quoque ingrato ceu gari dissentiens a sale, non modo a spuma.* "Flower of Salt' is also a name given to an entirely different thing, with a moister nature and a saffron or red colour, a kind of salt rust; it has an unpleasant smell, like that of garum, and is different from salt, not only from foam salt." (trans. Loeb ed.).

source records that an octopus at Carteia in Baetica had become enmeshed in the fish tanks and become coated with *Muria* making it smell terrible.<sup>153</sup> Despite this it would appear that although *Garum* possessed a strong smell, it only actually smelt bad when it had been spoilt. Martial refers to an amphora tainted with spoilt *Garum*<sup>154</sup> and Apicius gives a recipe to improve such an occurrence.<sup>155</sup> Unfortunately the impression of fish sauces as foul smelling concoctions has remained current and has led to the mistaken archaeological belief that fish salteries will not have been located within urban areas<sup>156</sup>, something that has subsequently been discredited thanks to the excavations principally at Baelo in Baetica.<sup>157</sup>

The hostile press of the ancient sources has remained current until comparatively recently. William Radcliffe, quoting an earlier work by Robinson in 1883, wrote that *they drenched their subtly- conceived dishes with Garum, alec, and other sauces, which were so strong and composite that it would have been hardly possible to distinguish a fresh fish from a putrid cat- except by the bones!*<sup>158</sup> Similarly Paoli, in his *Rome, Its People, Life and Customs*, concluded that *Our stomachs would probably revolt at a dish prepared with Garum.*<sup>159</sup> Thomas Corcoran comments *But it is difficult to imagine anyone drinking Garum, a feat analogous to drinking Horse Radish.*<sup>160</sup>

In recent years, however, the pendulum has swung in to opposite direction and to underplay the undesirable characteristics of the sauces, as Pierre Grimal and Thomas Monod so succinctly put it:

*Et, cependant, la seule consideration des textes aurait du inciter à plus de prudence. S'il est vrai que pendant neuf siècles au moins- du temps d'Eschyle jusqu'a l'édit de Diocletien- le monde antique a utilisé le Garum,*

<sup>153</sup>Pliny *NH* 9.92, cf also Aristotle *HA* 4.8 (548a) and Pliny *NH* 10.94 on the strong smell of salt fish.

<sup>154</sup>Martial 6.93.6: *amphora corrupto nec vitiata garo.*

<sup>155</sup>*De Re Coquinaria* 1.7: *liquamen si odorem malem fecerit.*

<sup>156</sup>On the similar criticisms of Purple Dye manufacture and the location of Dyeing installations, cf Appendix.

<sup>157</sup>The location of the fisheries within Eastern Tarraconensis shall be discussed later in this thesis.

<sup>158</sup>(1921) *Fishing from the Earliest times* (London) p 212.

<sup>159</sup>Paoli, U (1963) *Rome, Its People, Life and Customs* (London) p 91

<sup>160</sup>Corcoran, T H (1963) op. cit. n. 75 p 206-7.

*il est peu vraisemblable que ce produit fut la <pourriture> que l'on dit:  
s'agirait-il d'une perversion du goût, générale dans toute le monde  
Méditerranéen et continuée sur un millénaire?*<sup>161</sup>

Rather it has now become fashionable to view ancient fish sauces in comparison with their modern counterparts produced in Indo-China as having been somewhat more moderate than the evidence outlined thus far would make us believe.<sup>162</sup> The modern Far Eastern and Turkish sauces closely resemble those of the Ancient World resulting from the maceration of salt and fish. The bacteriological fermentation of these sauces effectively results in their maturation in the manner of certain strong cheese. The highest quality sauces seem to have possessed a taste and odour of a salty and cheese-like character and have been likened to Limburger cheese.<sup>163</sup> Lower quality sauces seem to have possessed a stronger odour and flavour of fish. Such sauces are a widespread part of the diet in SE Asia and are an important component of a healthy diet, being a source of vitamins and proteins.<sup>164</sup>

This favourable interpretation of *Garum* has received some currency amongst the ancient literary sources. Several of the authors that we have already cited for their hostility to *Garum* also express a liking for the sauce: the Elder Pliny calls it *liquoris exquisiti genus, quod Garum vocavere*.<sup>165</sup> He also states that it could be blended to the colour of old honey wine- recalling the clear amber and brown liquid of the highest qualities of Philippine 'patis', Vietnamese 'nuoc-nam' and the Thai 'nam-pla'<sup>166</sup>- and

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<sup>161</sup>cf Grimal, P and Monod, Th (1952) op. cit. n. 31 p 27.

<sup>162</sup>cf esp. Grimal, P and Monod, Th (1952) op. cit. n. 31; Balil, A (1953) "Un estudio sobre el 'Garum'" in *AEA* 26 p 183-5; Jardin, C (1961) "Garum et sauces de poisson de l'antiquité" in *RSL* 27 p 70-96; Curtis, R I (1983) op. cit. n. 146 p 232-240. The fullest description of the processing of modern fish sauces is given by Curtis, R I (1991) op. cit. n. 31 p 15-26; I regret that I have been unable to consult any of the sources cited by Curtis in this regard, especially Mackie, I M, Hardy, R and Hobbs, G (1971) *Fermented Fish Products* (FAO Fisheries Reports n° 100, Rome).

<sup>163</sup>cf Balil, A (1953) op. cit. n. 162 p 184.

<sup>164</sup>Curtis, R I (1991) op. cit. n. 31 has recently drawn attention to research carried out upon the diets of Japanese immigrants and in Japan itself which has suggested a connection between stomach cancer and the consumption of fish sauces, cf Haenszel, W, Minoru Kurihara, Mitsuo Segi, and Lee, R K C (1972) "Stomach Cancer among Japanese in Hawaii" in *Journal of the National Cancer Institute* 49 p 969-988; Haenszel, W, Minoru Kurihara, Locke, F B, Kiyoshi Shimuzu, and Mitsuo Segi (1976) "Stomach Cancer in Japan" in *Journal of the National Cancer Institute* 56 p 265-274.

<sup>165</sup>NH 31.43.93: "a kind of choice liquor, called Garum." (trans. Loeb ed.).

<sup>166</sup>Curtis, R I (1991) op. cit. n. 31 p 21.

possesses a taste that is so pleasant that it can be drunk.<sup>167</sup> Even *Hallec* is said to be a luxury.<sup>168</sup> Martial refers to a *nobile Garum*<sup>169</sup> and devotes an entire epigram to singing the praises of the very same sauce.<sup>170</sup> Evidently *Garum* was not solely bad.

This depiction of fish sauces as a more desirable product is supported by the frequency of *Garum* within the archaeological record and by the widespread use of such sauces. The popularity of fish sauce is most immediately obvious from its use in cuisine as a condiment: something that is apparent from its frequency within the recipes of Apicius. Pliny captures something of this positive aspect of its use when he writes: *conditur etiam odoribus additis et pulmentarii vicem implet, excitans aviditatem invitansque in omnibus cibis ita, ut sit peculiaris ex eo intellectus inter innumera condimenta ciborum item in mandendo quaesitus garo.*<sup>171</sup> The picture of fish sauce as an object of some value in Roman cuisine is shown by Horace's inclusion of *Garum* within the *Cena of Nasidienus*.<sup>172</sup> A sign of the success of fish sauce is perhaps best seen in the inclusion of the spicy sauce within the dinner of the nouveau-riche freedman Trimalchio.<sup>173</sup> Ausonius evidently attached some value to a gift of *Muria Barcinonensis* from Paulinus which, having described the gift, elicited the comment: *quid autem tam amabile tamque hospitale quam quod tu, ut me participes, delicias tuas in ipsa primitiarum novitate defrudas?*<sup>174</sup> *Garum* seems to have been a popular dish on the tables of the wealthy. A Second Century papyrus from Egypt indicates that it was

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<sup>167</sup>Pliny *NH* 31.44.95: *sicuti garum ad colorem mulsi veteris adeoque suavitatem dilutum ut bibi possit.* "garum for instance has been blended to the colour of old honey wine, and to a taste so pleasant that it can be drunk." (trans. Loeb ed.).

<sup>168</sup>Pliny *NH* 31.44.05: *transiit deinde in luxuriam* "Then Allex became a luxury." (trans. Loeb ed.).

<sup>169</sup>Martial 13.82.

<sup>170</sup>Martial 13.102: *Expirantis adhuc scombri de sanguine primo accipe fastosum, munera cara, garum.*

<sup>171</sup>Pliny *NH* 31.91.87: "A conserve too is made with fragrant additions, which is used as a relish, creating and sharpening an appetite for every kind of food, so that in innumerable seasonings it is the taste of salt that predominates, and is looked for when we eat garum." (trans. Loeb ed.).

<sup>172</sup>Horace *Satires* 8: "First there was a wild boar. It was caught when a gentle south wind was blowing, as the father of the feast kept telling us. Around it were pungent turnips, lettuces, radishes- such things as whet a jaded appetite- skirret, fish-pickle, Coan lees. When these were removed, a high girt slave with purple napkins wiped well the maple-wood table, while a second swept up the scraps and anything that could offend the guests. Then like an Attic maid bearing Ceres' sacred emblems, there came forward dusky Hydaspes with Caecuban wine, and Alcon with Chian, unmixed with brine." (trans. Loeb ed.).

<sup>173</sup>Petronius *Satyricon* 36: "Four figures of Marsyas at the corners of the dish also caught the eye; they let a spiced sauce run from their wine-skins over the fishes, which swam about in a kind of tide race." (trans. Loeb ed.), cf also 70.

<sup>174</sup>Ausonius *Epistle* 25. 10-11.

destined for consumption by the Prefect of Egypt<sup>175</sup>, and in the Fourth Century it is recorded that Theophanes, an official of the staff of the Prefect, during a stay in Antioch sometime between AD 317 and 323, included fish sauce as part of the provisions for himself and his staff.<sup>176</sup> A similar case is recorded in the *Vita Aureliani*, where Valerian writes to the Prefect of the City, Ceionius Albinus requisitioning various items including a pint of *Liquamen* for Aurelian's stay in Rome.<sup>177</sup> Although the letter is very likely a forgery, there is no reason to doubt the sentiments expressed within. We possess a description of the arrangements made prior to a visit by the emperor Caracalla to Egypt in AD 216 which included ensuring the provision of *Garum* and *salsamentum* to the Emperor's table.<sup>178</sup>

This association between *Garum* and the tables of wealthy may explain the criticism expressed in the ancient sources that fish sauces were objects of great expense and they seem to have become viewed as representatives of excessive luxury. Polybius records that 300 *drachmae* could be paid for one jar of Pontic fish sauce.<sup>179</sup> Pliny says that *Garum Sociorum* cost 1,000 sesterces for two *congi* of the sauce<sup>180</sup>- a price

<sup>175</sup>P. Lond 1159 ed. Kenyon, F G and Bell, H I (1893-) *Greek Papyri in the British Museum* 3 (London).

<sup>176</sup>P. Ryl 4.627-639 ed. Hunt, A S, Johnson, J de M, Martin, V and Roberts, C H (1911) *Catalogue of Greek Papyri in the John Rylands Library at Manchester* (Manchester).

<sup>177</sup>SHA *Vita Aureliani* 9: *quare Sinceritas tua, mi parens carissime, supra dicto viro adiciet, quandiu Romae fuerit, panes militares mundos decim, panes militares castrenses quadraginta, vini mensalsi, sextarios quadraginta, porcellum dimidium, gallinaceos duos, porcinae pondo triginta, bubulae pondo quadraginta, olei sextarium unum et item liquaminis sextarium unum, salis sextarium unum, herbarum holerum quantum sat est.* "Wherefore your Integrity, my dearest kinsman, will supply the aforesaid man, as long as he shall be in Rome, with sixteen loaves of soldiers' bread of the finest quality, forty loaves of soldiers' bread of the quality used in camp, forty pints of table wine, the half of a swine, two fowl, thirty pounds of pork, forty pounds of beef, one pint of oil and likewise one pint of fish-pickle, one pint of salt, and greens and vegetables as much as shall be sufficient." (trans. Loeb ed.).

<sup>178</sup>P. Got 3 ed. Frisk, H (1929) *Papyrus Grecs de la Bibliotheque Municipale de Gothembourg* (Goteborg), 4-15: ομολογω εκουσιως και αυθεραιτως/ ενγυαθαι Ψαις Θαιτος μητ(ρδς) Σεκωτος/ αλια και εισδοθεντα επι της ετοιμα/σιαφ γαρου τε και ταρειχου λεπτου και/ ιχθυος προς εις την ευκλειστατην/ επι[δ]ημιαν του κυριου ημων Αυτοκρα(τορος)/ Καισαρος Μαρκ[ο]υ Αυρηλιου Σ[εου]ηρου/ Αντωνινου [Παρ]θικου Μ[εγισ]του/ Βρεντανικο[υ] Μ[εγισ]του Γε[ρμ]ανικου/ Μαγιστου Ευ[σεβ]ου[ς] [Σε]βασ[του], και ομνυω/ την του κυρι[ου] τυχην παρασ[τη]σειν τον/ προκ(ειμενον).

<sup>179</sup>Polybius 31.25.4: "So far had the taste for dissipation and debauchery spread among young men that many of them were ready to pay a talent for a male prostitute and 300 drachmae for a jar of Pontic pickled fish." (trans. Penguin ed.).

<sup>180</sup>Pliny *NH* 31.43.94: *nunc e scombro pisce lauditissimum in Carthagini Spartariae cetariis-sociorum id appellatur- singulis milibus nummum permutantibus congios fere bios. nec liquor ullus paene praeter unguenta maiore in pretio esse coepit, nobilitatis etiam gentibus.* "Today the most popular garum is made from the scomber in the fisheries of Carthago Spartaria- it is called garum of the allies- one thousand sesterces being exchanged for two congi of the fish. Scarcely any other liquid

matched only by the highest quality perfumes. Further to this Pliny concludes his general discussion of fish sauces with the comment: *haec obiter indicata sint desiderii vitae, et ipse tamen non nullius usus in medendo*<sup>181</sup> - despite the vagaries of its character and perhaps excessive luxury, we catch a glimpse here of a sentiment in which the consumption of fish sauce, like that of salt, was seen to be a prerequisite of civilised life. Criticisms of luxury can also be detected in the hostility of the sources that we referred to above: Seneca, while calling *Garum Sociorum* a sauce of salted putrefaction, further implies that it was a costly commodity<sup>182</sup> whilst Martial adds that *Garum* would only be sent as a gift to a rich man.<sup>183</sup> Interestingly in this regard Lucilius and Aulus Gellius record a Licinian law from the late Second Century BC that endeavoured to limit the amount of dried meat and fish sauce that could be consumed.<sup>184</sup>

The incorporation of fish sauce within this sumptuary legislation may in fact explain the criticisms that *Garum* has received as an object of expense and luxury. To the Romans the period of the Late Republic and Early Empire was marked by a moral crisis of which the contemporary moralists seem to have seen the increase in luxury and debauchery as both a symptom and a cause of the moral decline, and attempts to curtail this excessive luxury is a regular feature of legislation in the last Century BC. In 161 BC a Lex Fannia attempted to fix the sums that could be spent on dinners, forbade the serving of fattened hens and limited the number of guests who could attend a dinner party.<sup>185</sup> The operation of the Lex Fannia was extended to cover the whole of Italy by the Lex Didia of 143 BC. An Aemilian law prohibited the consumption of dormice,

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except unguents has come to be more highly valued, bringing fame even to the nations that make it." (trans. Loeb ed.).

<sup>181</sup>NH 31.44.96: "these incidental remarks must suffice for the luxurious tastes of civilised man." (trans. Loeb ed.).

<sup>182</sup>Seneca *Epistle* 95.25.

<sup>183</sup>Martial 13.103.

<sup>184</sup>Lucilius 13.599: "Gellius: Then a Licinian law was brought forward... which laid down fixed weights of dried meat and pickled fish for each day, and yet bestowed without distinction of kind or quantity whatever came from soil, vine or fruit tree... Lucilius also mentions this law in these words- 'Let us avoid the Licinian law.'" cf also 600: "Paullus: Dinners called 'hundred-halfpenny dinners' were those on which by a Licinian law, not counting food sprung from the soil, not more than 'centussis' was spent, that is one hundred asses, which were small coins of copper." (trans. Loeb ed.).

<sup>185</sup>Lucilius 1172M; Aulus Gellius 2.24.2-6; Macrobius *Sat.* 3.17.3-5; Pliny *NH* 10.139; Athenaeus 6.274 c-e.

shell-fish and imported birds.<sup>186</sup> The effectiveness of these laws seems to have been limited and those of Didius and Aemilius had to be reiterated by the Lex Licinia that we referred to above. Further legislation fixed the prices of wine.<sup>187</sup> A Lex Cornelia Sumptuaria set a maximum prices for a number of extravagant delicacies.<sup>188</sup> Caesar in 46 BC forbade the sale of certain expensive foodstuffs and reintroduced a limit upon the amount of money that could be spent on food.<sup>189</sup> In 22 BC Augustus attempted to introduce limits on the expenditure upon food although this was again unsuccessful and Tiberius was left to remark acerbically that such legislation was a waste of time.<sup>190</sup>

When faced with the moral degeneracy of their own generation, the literature of the First Century BC regularly harked back to the frugal days of the Early Republic. Sallust says that harlots and banquets had replaced arms and war horses as objects of pleasure<sup>191</sup>, whilst Juvenal comments that the humble fare of Manius Curius Dentatus would be scorned even by the most sordid in his own day.<sup>192</sup> A number of sources compared the decadence that they saw around them with the high ideals of their ancestors and attempted to find a cause. Plautus blamed it upon the Greeks, although Sallust put the blame more heavily upon the tastes brought back from Asia by Sulla's army.<sup>193</sup> Polybius places such with the dissoluteness acquired during the war against

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<sup>186</sup>Macrobius *Sat.* 3.17.6, 3.17.13; Aulus Gellius 2.24.12; Pliny *NH* 8.223; *De vir. ill.* 72.5.

<sup>187</sup>Aulus Gellius 2.24.7; Macrobius *Sat.* 3.17.7-10; Pliny *NH* 14.95.

<sup>188</sup>Aulus Gellius 2.24.11; Macrobius *Sat.* 3.17.7-10.

<sup>189</sup>Cicero *Ad fam.* 7.26; 9.15.5; 9.26,3; Suetonius *Divus Julius* 43.6: "To implement his laws against luxury he placed inspectors in different parts of the market to sieze delicacies offered for sale in violation of his orders; sometimes he even sent lictors and guards into dining rooms to remove illegal dishes, already served, which his watchmen had failed to intercept." (trans. Penguin ed.); Dio Cassius 43,25,2.

<sup>190</sup>Aulus Gellius 2.24.15; Suetonius *Divi Augusti* 34.1: "The existing laws that Augustus revised, and the new ones that he enacted dealt among other matters, with extravagance, adultery, unchastity, bribery, and the encouragement of marriage in the Senatorial and Equestrian Orders."; Dio Cassius 54,2,3: "As regards the public banquets, he abolished some altogether and reduced others to a more modest scale.". For Tiberius cf Tacitus *Annals* 3.52-55: "If our energetic aediles had consulted me earlier, I should perhaps have advised them not to tackle such deep-set, flagrant evils- so as not to publish our helplessness against them." (trans. Penguin ed.).

<sup>191</sup>Sallust *Bell. Cat.* 7.4: "To begin with, as soon as the young men could endure the hardships of war, they were taught a soldier's duties in camp under a vigorous discipline, they took more pleasure in handsome arms and war-horses than in harlots and banquets." (trans. Loeb ed.).

<sup>192</sup>Juvenal *Sat.* 11.78-119.

<sup>193</sup>Sallust *Bell. Cat.* 11.5-7: *Huc accedebat quod L.Sulla exercitum quem in Asia ductaverat, quo sibi fidum faceret, contra morem maiorum luxriose nimisque liberaliter habuerat. Loca amoena, voluptaria facile in otio ferocis militum animos molliverant. Ibi primum insuevit exercitus populi Romani amare, potare; signa, tabulas pictas, vasa caelata mirari; ea privatim et publice rapere, delubra spoliare, sacra profanaque omnia polluere. Igitur ei milites, postquam victoriam adepti sunt,*

Perseus.<sup>194</sup> Philo more controversially alleges that it was imitation of Italian practices that were to blame rather than of Greek<sup>195</sup> although this view has not received much currency.

As we have already seen *Garum* was of Greek derivation and seems to have become current in Rome during the late Third Century/early Second Century BC, with *Hallec* first appearing in Latin in the works of Plautus<sup>196</sup>, although *Garum* itself only appears in the First Century BC *De Lingua Latina* of Varro.<sup>197</sup> Thus it seems to have been included in the diffusion of Hellenistic luxuries following Rome's first contacts with the Greek world. Such a linkage is clearly envisaged by Polybius who cites, as an example of the adoption of Greek luxury, the high price that Pontic fish sauce could raise in Rome, whilst Cato is said to have used its price as evidence for the declining Republic.<sup>198</sup> It seems a reasonable supposition that it was amongst the items subject to prohibition by the sumptuary legislation referred to above. Thus the widespread consumption of fish sauce was an aspect of the adoption of Greek ideals and habits during the Second Century BC and of the subsequent moral decline that beset the state<sup>199</sup>. As a notable example of this fish sauce was open to criticism as a feature of moral degeneracy and wasted luxury- not that it was the only example of it but its prominence will have made it a ready target for moralistic sources. Such hostility may well have been based, therefore, more upon a philosophic base against the permeation of Greek habits and moral uncertainty rather than one based upon the merits, or lack thereof, within the fish sauces themselves.

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*nihil reliquie victis fecere. Quippe secundae res sapientium animos fatigant, ne illi corruptis moribus victoriae temperarent.*

<sup>194</sup>Polybius 31.25.4.

<sup>195</sup>Philo *De Vita Contempl.* 48-56. cf also Tacitus *Annals* 3.5.2: [Tiberius] "Frugality used to prevail because people had self-control- and because we were citizens of one city. Even our domination of Italy did not bring the same temptations. But victories abroad taught us to spend other peoples' money. Then civil wars showed how to spend our own." (trans. Penguin ed.).

<sup>196</sup>Plautus *Aulularia* frg. 5; *Persa* 105; *Poenulus* 1310, cf n. 24 - the precise dating of Plautus' plays is problematic although they lie in the period from the later years of the Second Punic War and the first two decades of the Second Century BC.

<sup>197</sup>Varro *De Lingua Latina* 9.40.66.

<sup>198</sup>Polybius 31.25.3.

<sup>199</sup>Fish sauce production within Italy may date back to the Fourth Century BC although it seems to have been at its most active from the Second Century BC onwards. On Italian fish sauce production, cf Curtis, R I (1991) op. cit. n. 31 p 85-96.

The prominence of the highest quality sauces on the tables of the wealthy is, however, an incomplete one as the use of fish sauce is similarly widespread amongst the lower echelons of society. The *Vita Elagabli* records that Elagabalus served *hydrogarum* at a public banquet, evidently this was exceptional as it had previously only been used as a condiment by common soldiers- a status that was restored by Severus Alexander.<sup>200</sup> Similarly *Liquamen* seems to have been a feature of the military diet when it is included in the list of soldiers' rations that are supplied to Aurelian for his visit to Rome.<sup>201</sup> A tablet recording the supplies for the garrison at Vindolanda lists *Muria* amongst the requirements of the unit<sup>202</sup>. This recalls the incidence of a Dr 7-11 amphora from Vindolanda bearing the titulus G(ari) F(los) S(combri).<sup>203</sup> A papyrus of AD 283 records γαρῶς amongst items supplied by the nome of Theadelphia to the army of Probus.<sup>204</sup> Such references can tell us little about the trading of fish sauces but it seems that they were a staple item in the diet and not merely the preserve of the wealthier classes.

The fullest study of fish sauce vessels has taken place on those found within the deposits of Pompeii<sup>205</sup> where it was concluded that fish sauce was well within the budget of the average Pompeian. A calculation of the relative numbers of *Garum*, *Liquamen*, *Muria* and *Hallec* vessels at Pompeii and Rome showed *Garum* to be the most frequent<sup>206</sup>- a result that contradicts the argument that *Garum* was the most expensive sauce. Furthermore those of Pompeii were found in a range of private houses and commercial establishments without any apparent differentiation according to wealth. One must, however, be wary of placing too much stress upon the reliability of Pompeii and Rome as a representative sample. The conclusion drawn that *Garum*,

<sup>200</sup>SHA *Vita Elagabalus* 29.5: *hydrogarum Romanorum ducum primus publice exhibuit, cum antea militaris mensa esset, quam postea statim Alexander reddidit.* "He was the first Roman emperor to serve at a public banquet fish-pickle mixed with water, for previously this had been only a soldiers dish- a usage which later was restored by Alexander." (trans. Loeb ed.).

<sup>201</sup>SHA *Vita Aureliani* 9.

<sup>202</sup>Bowman, A K (1974) "Roman Military records from Vindolanda." in *Britannia* 5 p 369 Inv. no 33i.14. For the Roman military diet, cf Davies, R W (1971) "The Roman Military diet." in *Britannia* 2 p 122-142.

<sup>203</sup>cf Wright, R P and Hassal, M W C (1974) "Roman Britain in 1973" in *Britannia* 5 p 467 n<sup>o</sup> 44.

<sup>204</sup>P.Cairo 78, cf Remondon, R (1954) "Un nouveau document concernant Probus" in *Revue de Philologie* 28.2 p 199-210: ἀννων [ηφ] [πρωτου] [καλ] [δευτερου] γαρ[ηρον].....[δραξμακ] σλ.

<sup>205</sup>cf Curtis, R I (1983) op. cit. n. 146 esp. p 236-7.

<sup>206</sup>Pompeii and Herculaneum: 118 *Garum*, 52 *Liquamen*, 21 *Muria*, 11 *Hallec*; Rome: 32 *Garum*, 8 *Liquamen*, 4 *Muria* and 2 *Hallec*.

rather than being an object of privileged luxury, was a readily available and ubiquitous item, can also be turned upon its head and replaced with the hypothesis that the other sauces were of a sufficiently low quality as to ensure the more widespread use of *Garum* regardless of a higher cost.

Two further sources can be cited to show that fish sauces were, at least not exclusively, an object of luxury but were staple items in the diet. The first of the is the Tariff of Zarai from Africa Proconsularis to AD 202, which records the customs duties imposed on goods travelling through the *portorium* of Zarai. Such charges were not calculated according to the quality of the items concerned but by quantity. Amongst the goods listed in the tariff is a duty of one *sestertius* upon one amphora of *Garum*.<sup>207</sup> The rate of taxation has been calculated at 2.5%<sup>208</sup> from which the cost for one amphora of *Garum* would be forty *sesterces*, the same price as is accorded to an amphora of wine listed in the Tariff and compares well with the prices given for the other foods listed.<sup>209</sup> The second source is the Edict of Maximum Prices promulgated in AD 301 by the emperor Diocletian. This lists two types of sauce grouped according to quality: the finest, *Liquamen Primum* did not exceed 16 denarii for one *sextarius* of sauce, whilst that of a lower quality, *Liquamen Secundum*, cost no more than 12 denarii per *sextarius*.<sup>210</sup> When calculated in terms of prices per amphora of sauce these figures work out as 768 denarii or 3,072 sestertii for one amphora of First Quality fish sauce; and 576 denarii or 2,304 sestertii for an amphora of second quality sauce. Again these

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<sup>207</sup>CIL viii.4508; a similar Tariff has been found at Lambaesis where some form of military supervision had occurred, cf Cagnat, R (1914) "A new Roman Customs list" in JRS 4 p 142-6: that of Zarai was formulated following the departure of the local cohort.

<sup>208</sup>cf Tenney Frank (1936) "On the export of Spanish harbours" in AJPh 57 p 87-90 in which the depiction of *aa*, amongst other variations, record the export tax imposed on Spanish goods in asses. cf also Ps.-Quintillian Declamations 359 [Regulations of a customs] "Except for means of transportation, all articles shall be subject to a tax of 2.5%, payable to the tax farmer. The tax farmer has the right of search. Undeclared articles shall be confiscated. The person of a matron shall not be searched." (trans. Lewis, N and Reinhold, M (1966) Roman Civilisation (Columbia University Press) p 145.). Frank's hypothesis has recently come under some scrutiny cf Colls, D, Etienne, R, Lequemet, R, Liou, B and Mayet, F (1977) "L'Epave Port-Vendres II et le commerce de la Betique a l'epoque de Claude." in Archaeonautica 1 (Paris) p 95-99.

<sup>209</sup>For example, the price given for Nuts and Green peas of half a denarius for ten *modii* is equated to 0.6 sesterces for an amphora of such.

<sup>210</sup>Edict iii.6-7; for this I have referred to the edition of the Edict in Tenney Frank (ed.) (1959) An Economic Survey of Ancient Rome (Baltimore) vol. 5.

figures align well with those given for other foods within the Edict<sup>211</sup> with *Liquamen Primum* costing the same as second quality one year old wine- hardly a figure that lends veracity to the exaggerated prices given for fish sauce by Polybius and Pliny. Bearing in mind the widespread finds of fish sauce amphorae and of the archaeological remains of fish factories, one is left to envisage the widespread use and ubiquity of fish sauces within Roman cuisine. The figures given by Polybius and Pliny thus do not represent a reliable figure but record exceptionally large payments for, presumably, a specific sauce of some fashionable or luxurious worth. Rather fish sauces do not seem to have been objects of excessive price and were a widely use condiment.

Although fish sauces are most noted for their use in cuisine, they were also important in Roman medicine.<sup>212</sup> As a rule ancient medicine was based upon a mixture of common sense observations and experience, a view that was expressed by Celsus.<sup>213</sup> Thus bodies were viewed as composed of four humours, the Warm, the Cold, the Dry and the Moist and the constituent ailments and treatments were grouped accordingly.<sup>214</sup> Salted foods, with which *Salsamentum* and fish sauces were included, were associated with heating and drying. The physical appearance of *Salsamentum* as a dry and stretched substance led to its characterisation as a drying agent.<sup>215</sup> Celsus says that salt fish and fish sauce were foods that possess bad juices, are alien to the stomach and

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<sup>211</sup>For example, Falernian wine cost 30 *denarii* per *sextarius*; first quality one year old wine, 24 *denarii*; second quality one year old wine, 16 *denarii*; and ordinary wine, 8 *denarii*. The prices when calculated for one amphora came out as 1440 *denarii* or 5760 *sesterces* for Falernian wine; 1152 *denarii* or 4608 *sesterces* for first quality wine; 768 *denarii* or 3,072 *sesterces* for second quality; 384 *denarii* or 1536 *sesterces* for ordinary wine.

<sup>212</sup>For the fullest discussion of the role of salted fish and fish sauces in medicine, cf Curtis, R I (1984) "Salted Fish Products in Ancient medicine" in *Journal of the History of Medicine and Allied Sciences* 39.4 p 430-445. This is substantially reprinted in Curtis, R I (1991) op. cit. n. 31 chap. 3. Much of the published discussion of fish sauces has concentrated upon their more prominent role as a condiment at the expense of its use in medicine.

<sup>213</sup>Celsus *On Medicine* 1. Preface 1-5,12,75: "I am of the opinion that the art of medicine ought to be rational but should also draw instruction from evident causes, all obscure ones being rejected from the practice of the art, although not from the practitioners' study." (trans. Loeb ed.).

<sup>214</sup>Galen *De Alimentorum Facultatibus* 2.8.116: "Aristotle stated and demonstrated [that] our bodies [are] compounded out of the Warm, the Cold, the Dry, and the Moist, that among these qualities the Warm is the most active, and that those animals which are by nature warmest have abundance of blood, whilst those that are colder are entirely lacking in blood, and consequently in winter be idle and motionless, lurking in holes like corpses." cf 2.8.118: "Also the diseases which are primary and most generic are four in number, and differ from each other in warmth, cold, dryness, and moisture" (trans. Loeb ed.).

<sup>215</sup>For the use of salt in medicine, cf appendix.

move the bowels.<sup>216</sup> The salty character of *Garum* meant that these characteristics of drying and loosening the bowels were applied to fish sauces although the sources add that *Garum*, being of a putrid character, was nearer to corruption and thus more readily excreted.<sup>217</sup> Further to this experience dictated that salted foods encouraged the appetite. Thus Pliny could describe *Muria* as a sauce that was astringent, biting, reducing and drying.<sup>218</sup> According to the Hippocratic Regimen the premise of ancient medicine was to achieve a balance between the four humours, therefore a diet of opposites was prescribed to treat perceived imbalances. Thus fish sauces and other salted foods were employed to counteract ailments associated with moisture and digestion. Dioscorides' De Materia Medica prescribes the use of *Garum* for the treatment of ulcers<sup>219</sup>, a treatment which is also ascribed by Galen who also refers to the association of sauces with heating and drying.<sup>220</sup> Bowel disorders seem also to have been a regular object of treatment by fish sauce- for which, as we commented above, its corrupt character was believed to make it particularly efficacious.<sup>221</sup> Unlike *Salsamentum* which seems most commonly to have been used on its own right, *Garum* is frequently described as being compounded with other foods to form a treatment. Thus Celsus states that fish sauce was mixed with beets to evacuate the stomach whilst

<sup>216</sup>Celsus De Medicina 2.21-29.

<sup>217</sup>Regimen 2.56.

<sup>218</sup>Pliny NH 31.44.97: *Muria quoque sive illa salsugo spissat, mordet, extenuat, siccatur.* "Muria too or the salsugo I spoke of is astringent, biting, reducing, drying." (trans. Loeb ed.).

<sup>219</sup>De Materia Medica 11.31: "Mainis. Sparus Maena. The head of the moena being burnt, and beaten small, and soe sprinkled on, doth amend the callosas fissures in sede, but ye *Garum* thereof being rolled up and downe about the mouth, doth assuage yet rotten ulcers therein." (trans. Gunther, R T (1934) The Greek Herbal of Dioscorides (Oxford).).

<sup>220</sup>Galen De simplicium medicamentorum temperamentis ac facultatibus 12.377k: Γάρου δυνάμεώς ἐστὶ θερμῆς ἰχθυῶς καὶ ξηρᾶς, καὶ διὰ τοῦτο πρὸς τὰ σηπεδονώδη τῶν ἐλκῶν ἐχρήσαντό τινες αὐτῶ τῶν ἰατρῶν, ἐπιᾶσι τε τοῖς δυσεντεροκοῖς τε καὶ ἰσχιαδιχοῖς. Ἄλμη τῶν ταριχηρῶν ἰχθυῶν ὁμοίως τῷ γάρῳ πρὸς τε τὰς σηπεδόνας ἀρμόζει καὶ πρὸς ἰσχυάδας καὶ δυσεντερίαν ἐννεμένη, τῷ δὲ δριμύτητι τοὺς μὲν τὸ ἰσχίον ἐνοχλοῦντας χυμοὺς ἐπισπᾶται καὶ διὰ τῶν ἐντέρων ἐκκενοῖ, τὰ δὲ σηπεδονώδη τῶν ἐλκῶν ἐν τῷ δυσεντερίᾳ περικλᾶζει τε καὶ ξηραίνει. μάλιστα δὲ τῷ τῶν ταριχηρῶν σιλούρων καὶ τῷ τῶν μαινίδων ἄλμη πρὸς τὰ τοιαῦτα κέχρηναί τινες ἰατροὶ, καὶ ἡμεῖς δ' ἐπὶ τῶν ἐν στόματι σηπεδονωδῶν ἐλκῶν ἐχρησάμεθα. cf also Pliny NH 31.45.97: *oris quoque et aurium ulceribus aut doloribus mirifice prodest.* "For ulcers too or pains in mouth or ears it is wonderfully good." (trans. Loeb ed.).

<sup>221</sup>Dioscorides De Materia Medica 2.34: "Garron. *Garum* from Salt Fish. All *Garum* (which is the liquor) that comes out of salted flesh or fish, being applied, doth represses the Nomes, and heales such as are bitten by dogs, and it is given somme-tyme by way of glistre to the Dysenterical and ye Ischiaticall, to thos that it may repress the exulceration (of the bowells), to these that it may provoke to exulceration ye parts not exulcerated to voyd ye humors vexing ye hipps." (trans. Gunther, R T

beets were mixed with lentils to act as a binding agent<sup>222</sup>, a similar treatment to which is given by Galen.<sup>223</sup> Such sentiments no doubt lie behind Pliny's treatment of a stomach disorder with *Garum* and snails to which he adds the qualification that it is more efficacious if the number of snails is odd.<sup>224</sup>

Thus far we have dealt with internal treatments which are based upon a common sense application of the perceived characteristics of fish sauces. The external use of *Garum* is, however, based more upon superstition than observation. Thus Pliny tells us that *Garum* could be used to treat burns, although one had apparently to beware to referring to it by name whilst it was being applied. Similarly sauces were also considered as treatment for the bites of dogs, the sea-dracon and crocodile.<sup>225</sup> Dioscorides states that *Garum* and specifically the salted flesh of the tunny could be used both in treating the bites of dogs and those of vipers.<sup>226</sup> A peculiar medicinal use of *Salsamentum* listed by Pliny is in the removal of weapons from the body<sup>227</sup>. Columella record that salt could be used in the treatment of the eyes and specifies the use of either Spanish, Ammoniac or Cappadocian salt.<sup>228</sup> Despite their being attested in the literary texts there is no evidence that the medicaments were ever effective.

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(1934.) cf also Galen De simplicium medicamentorum temperamentis ac facultatibus 12.377k op. cit. n. 220.

<sup>222</sup>Celsus De Medicina 2.29-30.

<sup>223</sup>Galen De Alimentorum Facultatibus 1.1.43.

<sup>224</sup>Pliny NH 30.44.

<sup>225</sup>Pliny NH 31.44.96-7: *namque et allece scabies pecoris sanatur infusa per autem incisam, et contra canis morsus draconisve marini prodest, in linteolis autem conceptis inponitur. Et garo ambusta recentia sanatur, si quis infundat ac non nominet garum. contra anum queque morsus prodest maximeque crocodili et ulceribus quae serpunt aut sordidis.* "For allec both cures itch in sheep, being poured into an incision in the skin, and is a good antidote for the bites of dog or sea-dracon; it is applied on pieces of lint. By garum too are fresh burns healed, if it is poured over them without mentioning garum. It is also good for dog bites and especially those of the crocodile, and for spreading on foul ulcers." (trans. Loeb ed.).

<sup>226</sup>Dioscorides De Materia Medica 2.33: "Omotarichos. Tunny-flesh. That which is called Omotarichos, is the flesh of the salted tunny. This being thaken doth help such as are bitten of ye viper called prester. But they which eat it must be compelled to drinke great store of wine, and soe to vomitt. It is excellent good also for ye same purposes that the eating of sharpe meats are. It is also profitably applied to ye bitings of doggs." (trans. Gunter, R T (1934).), cf also 2.34.

<sup>227</sup>Pliny NH 32.45-7, 79-80, 90,95, 101, 105-8, 116, 119, 125-7, 135.

<sup>228</sup>Columella De Re Rustica 6.17.7: "Maladies of the eyes are generally cured with honey. If they have swollen up, wheaten flour is sprinkled with honey and applied to the eyes; or, if there as a white film on the eye, Spanish or Ammoniac or even Cappadocian rock-salt, pounded small and mixed with honey, lessens the malady. The shell of a cuttle-fish ground up and blown into the eye three times a day through a pipe has the same effect, as also had the root which the Greeks call 'silphion' and of which the common name in our language is 'laserpitium'. To any of this ten parts of Ammoniac salt are added; and both are poured similarly into the eye after being ground up in the same manner, or else

Veterinary medicine also made use of fish sauces. Its functions seem to have been the same as those in human medicine being considered as heating and drying and being associated with digestive disorders. The instances of the use of fish sauce, however, are based more upon superstition than reasoned observation. Columella describes a method of taming animals whereby salt is rubbed on the palate and mouth of the animal.<sup>229</sup> Elsewhere Columella advises that a mare suffering emaciation should be fed four *sextarii* of sauce through the nose<sup>230</sup> which he adds could also serve as a laxative. Similarly cabbage stalks were dipped in oil and *Garum* to cure a fevered cow.<sup>231</sup> As with its use for humans *Garum* was added to recipes to produce a more palatable medicine.<sup>232</sup>

Thus fish sauces played a role in medicine of some importance, yet this aspect has been largely ignored. Such was the over-bearing prominence of *Garum*'s use as a condiment and the connotations associated with this that there was a logical trend to view its importance purely in culinary terms. Beyond the literary sources the use of *Garum* as a medicine is impossible to quantify. Yet it would be interesting to know how much use of the locally produced fish sauces was made by the Dianensian doctor, P. Sicinius Eutyclus.<sup>233</sup>

Thus we have seen the production of four varieties of fish sauce and numerous variations upon these. Despite criticisms in the ancient literary sources, their popularity within the archaeological record shows them to have been a popular part of the ancient diet. Recent discussions have underplayed their putrid characteristics and associated them with modern Indo-Chinese sauces. The high levels of salinity required in their production is, however, alien to the modern western palate making it difficult to formulate opinions of the merits in the Roman diet. Thus it might be best to view them as somewhat of an acquired taste; certainly the best varieties possessed an appealing taste and appearance and attracted high prices, but it does seem that even the better

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the root of the same plant crushed up and mixed with oil of mastic is used to anoint the eye and purges away the malady." (trans. Loeb ed.).

<sup>229</sup>Columella *Re Rustica* 6.2.7.

<sup>230</sup>Columella *Re Rustica* 6.3.4.

<sup>231</sup>Columella *Re Rustica* 6.9.1.

<sup>232</sup>Curtis, R I (1984) op. cit. n. 212 p 443.

<sup>233</sup>P.SICINIUS/P L/EUTYCHUS/MEDICUS/H.S.EST. Inscription preserved in the Mus. Arq. de Denia.

categories never escaped from being a comparatively cheap and ubiquitous item in the diet. This is perhaps best represented in the frequency of fish factories involved in the production of such sauces across much of the Mediterranean, and it is to the origins of these that we must now turn.



## THE ORIGINS OF FISH SAUCE PRODUCTION

### 1. GREEKS AND PHOENICIANS

The processes of preserving fish described in the preceding chapter have long been recognized as having been of an ancient origin and it is generally accepted that such is to be found in the communities of the Levant and Aegean, arriving in the Western Mediterranean as a consequence of the colonizing movements of the Ninth-Eighth Centuries BC. Beyond this consensus of opinion the mechanics of the development of processing in the Iberian Peninsula have been the object of debate with both a Greek and a Phoenician origin for such being favoured, although the latter remains the most widely accepted.<sup>1</sup>

According to the Greek geographer Strabo the earliest settlement of the Iberian Peninsula occurred at the hands of Phoenician merchants who founded Gadir (Cadiz) at the end of the Trojan war.<sup>2</sup> Velleius Paterculus alludes to a similar date<sup>3</sup> whilst Diodorus Siculus describes the Phoenician establishment of a trading community at Gadir and to the high profits that were gained therefrom.<sup>4</sup> Both Diodorus and

<sup>1</sup> cf Edmondson, J C (1987) *Two Industries in Roman Lusitania* BAR Int. Ser. 362 (London); Etienne, R (1970) "A propos du 'Garum Sociorum'" in *Latomus* 29 p. 297-313. It is also worth noting that the exploitation of marine resources is known to have taken place within the Iberian Peninsula as early as the Neolithic and some utilisation of salting as a preservative technique is probable, cf Mangas, J and Rosario Hernando, Ma (1990) "La Sal y las relaciones intercomunitarias en la Peninsula Ibérica durante la Antigüedad" in *Memorias de Historia Antigua* 11-12 p. 219-231. On the evidence for fishing within pre-colonial settlements in the Iberian Peninsula, for example, cf Gusi i Jener, F and Olaria i Puyoles, C (1991) *El Poblado Neoeolítico de Terrera-Ventura (Tabernas, Almería)* EAE 160 (Madrid).

<sup>2</sup> Strabo 1.3.2: "Again, the maritime supremacy of Minos is far-famed, and so are the voyages of the Phoenicians, who, a short time after the Trojan war, explored the regions beyond the Pillars of Hercules and founded cities both there and in the central parts of the Libyan seaboard." (trans. Loeb ed.).

<sup>3</sup> Velleius Paterculus *History of Rome* 1.ii.3: *Ea tempestate et Tyria classis, plurimum pollens mari, in ultimo Hispaniae tractu, in extremo nostri orbis termino, in insula circumfusa Oceano, perexiguo a continenti divisa freto, Gadis condidit. Ab iisdem post paucos annos in Africa condita est.* "About this time, also, the fleet of Tyre, which controlled the sea, founded in the furthest district of Spain, on the remotest confines of our world, the city of Cadiz, on an island in the ocean separated from the mainland by a very narrow strait. The Tyrians a few years later also founded Utica in Africa." (trans. Loeb ed.).

<sup>4</sup> Diodorus Siculus 5.20.1-3.

Pomponius Mela link this foundation with the slaying of Geryon by Heracles-Melqart at a point shortly after the fall of Troy (dated to approximately 1100 BC).<sup>5</sup> How then does a traditional date in the Twelfth-Eleventh Century BC accord with the archaeological evidence and with that for the beginnings of fish salting in the Peninsula?

Although the identity of the Phoenicians as a people originating on the Levantine coast centred upon the ancient cities of Tyre, Sidon, Byblos, Berytos, Sarepta, Akko, Arvad and Akhziv is undisputed, the precise origin of this nomenclature is less clear.<sup>6</sup> The details of these arguments are beyond the scope of this thesis, suffice it say that the roots of both *Phoenician* (the Greek name by which they are today most commonly known) and *Canaanite* (the name used by the Phoenicians themselves) are derived from a variety of terms designating both purple dye and merchant<sup>7</sup> - the two principal characteristics of the Phoenicians, although it is unclear which definition came first.<sup>8</sup> We shall discuss Purple Dyeing more fully in chapter six but its operation implies the existence of a fish salting industry at the same time and the Phoenician utilisation of marine resources is well known. It is in the light of their concentration upon the sea and the coincidence between Phoenician centres and later Roman fish salteries that many have chosen to view them as the originators of the fish salting industry in the Western Mediterranean. Archaeological evidence in the form of Murex shells have been found at a number of locations along the coast of Phoenicia, for example, at Dor, Akko, Sarepta and Latakia,<sup>9</sup> whilst Phoenician colonies to the west, as at Motya, have also afforded evidence for such activities.<sup>10</sup> It is worth noting in this regard that several Phoenician

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<sup>5</sup> Pomponius Mela 3, 47; cf also Aubet, M E (1993) The Phoenicians and the West: Politics, Colonies and Trade (Cambridge) p 168-170, Arribas, A (1963) The Iberians (London) p 47.

<sup>6</sup> cf Aubet, M E (1993) op. cit. n. 5 p 5-16.

<sup>7</sup> The Phoenician *can'ani* appears to be related to the Hebrew *cana'ani* or merchant, whilst the Greek *phoenix* may be a translation of the Akkadian *kinahhu* which designated the dyed wool that was their most famous export.

<sup>8</sup> The understanding of the term *Phoenician* is further complicated by its indiscriminate use with the term *Punic*. I shall follow the conventional wisdom in using Phoenician to describe the earlier colonial contacts and Punic to refer to the Carthaginian presence from the Fourth Century BC.

<sup>9</sup> cf Pritchard, J B (1978) Recovering Sarepta, a Phoenician City: Excavations at Sarafand, Lebanon, 1969-1974, by the University Museum of the University of Pennsylvania (Princeton); Arenson, S (1990) The Encircled Sea: the Mediterranean maritime civilization (London); Moscati, S (1968) The World of the Phoenicians (New York) p 82-83.

<sup>10</sup> cf Aubet, M E (1993) op. cit. n. 5 p 202.

centres such as Akko were famed for their fish into the Roman period<sup>11</sup> whilst Lucian describes Phoenicians as mostly being salt fish merchants<sup>12</sup> and the tombstone of one such γαροπωλης has been found at Tyre.<sup>13</sup>

Even so it is impossible to link the early settlements of the Iberian Peninsula described in the literary record with the evidence afforded by archaeology. Although some have chosen to view the date of c1100 BC for the foundation of Gadir as the consequence of pre-colonial, commercial contact<sup>14</sup> rather we envisage a Phoenician colonial horizon in the Ninth Century BC. The earliest Phoenician evidence in the Western Mediterranean is the Nora stele from Sardinia which is dated to the end of the Ninth Century BC, although there is no evidence for a Phoenician population at Nora prior to the Seventh Century BC with a consequent degree of uncertainty as to the attribution of the inscription.<sup>15</sup> It is possible that it represents a pre-colonial phase characterised merely by commercial contact without any permanent settlement extending as far as the Iberian Peninsula where Late Bronze Age (Ninth-Eighth Centuries BC) finds from El Carambolo (Seville) and Berzocana (Cáceres) may show eastern influences. As it is, the earliest archaeological evidence from Gadir dates to the Eighth Century BC. Amongst the most problematic finds from the site was the discovery of a limestone capital from the island of San Sebastian which seems to have come from the temple of Cronos or Baal-Hammon that is referred to by Strabo<sup>16</sup> and the Elder Pliny<sup>17</sup> and which seems to be proto-Aeolian in style and thus dates to the Eighth-Seventh Centuries BC.<sup>18</sup> Gadir does not seem to have remained alone for long with a number of smaller settlements being established along the Mediterranean coasts

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<sup>11</sup> cf Sperber, D (1968) "Some observations of Fish and Fisheries in Roman Palestine" in Zeitschrift der Deutschen Morgenlandischen Gesellschaft 118 p 265.

<sup>12</sup> Lucian Toxaris 4. cf Curtis, R I (1991) Garum and Salsamenta: Production and Commerce in Materia Medica (Leiden) p 142 n. 155.

<sup>13</sup> cf Rey-Coquais, J-P (1977) Inscriptions grecques et latines découvertes dans les fouilles de Tyr (1963-1974) I. Inscriptions de la nécropole (Paris) p 154. I regret that I have been unable to consult this source directly, it is cited by Curtis, R I (1991) op. cit. n. 12 p 142.

<sup>14</sup> cf Aubet, M E (1993) op. cit. n. 5 p 167, 172-174; cf also Graham, A J (1990) "Pre-colonial contacts: Questions and Problems" in Descoedres, J-P (ed.) Greek Colonists and Native Populations Proceedings of the First Australian Congress of Classical Archaeology held in honour of Emeritus Professor A D Trendall (Oxford) p 45-60.

<sup>15</sup> cf Aubet, M E (1993) op. cit. n. 5 p 179-181.

<sup>16</sup> Strabo 3.5.3.

<sup>17</sup> Pliny NH 4.120.

<sup>18</sup> cf Aubet, M E (1993) op. cit. n. 5 p 229-230.

of Andalusia. The region between Adra and the R. Guadalhorce being densely populated by Phoenician communities dating to the Eighth-Sixth Centuries BC.

The most fully excavated of these communities is at Toscanos lying on the mouth of the R. Vélez which was settled in c740-730 BC on the basis of ceramic finds paralleling those from levels III and II at Tyre.<sup>19</sup> Although the initial settlement appears to have been a small one, by the close of the Eighth Century BC it had expanded to number 1,500 inhabitants at its height<sup>20</sup> before being abandoned around 550 BC,<sup>21</sup> although settlement in the vicinity may have continued with the necropolis Jardín remaining in use until the Third Century BC.<sup>22</sup> Similar dates are afforded by the other Phoenician communities. The colony of Sexi-Almuñécar was founded in 760-740 BC whilst the nearby cemetery of Cerro de San Cristobal has been dated to the period 700-625 BC.<sup>23</sup> A short distance from these burials is the necropolis of Puente de Noy which was in use between the Seventh Century BC and First Century AD, although the majority of the 166 graves are dated to the Fifth Century BC.<sup>24</sup> The settlement at Morro de Mezquitilla located on the mouth of the R. Algarrobo is dated to the period 800/780-500 BC with the nearby necropolis of Trayamar being dated to 650-500 BC.<sup>25</sup> Only 800m to the east of Morro de Mezquitilla is the settlement of Chorreras which may have been the earliest of the Phoenician foundations belonging to c800 BC before being abandoned in the mid Seventh Century BC.<sup>26</sup> The settlement at Malaka is dated to the Sixth-Fourth/Third Centuries BC, whilst that of Cerro del Villar is dated to 720-550 BC at which point the population would appear to have moved to the neighbouring

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<sup>19</sup> cf Aubet, M E (1993) op. cit. n. 5 p 259; Acquaro, E, Aubet, M E and Fantar, M H (1993) Insedimenti Fenici e Punici nel Mediterraneo Occidentale (Rome) p 164-167.

<sup>20</sup> cf Harrison, R J (1988) Spain at the Dawn of History (London) p 46.

<sup>21</sup> cf Aubet, M E (1993) op. cit. n. 5 p 264.

<sup>22</sup> cf Acquaro, E, Aubet, M E and Fantar, M H (1993) op. cit. n. 19 p 166-167.

<sup>23</sup> cf Pellicer Catalan, M (1963) Excavaciones en la necrópolis púnica 'Laurita' del Cerro de San Cristóbal (Almuñécar, Granada) EAE 17 (Madrid); cf also Acquaro, E, Aubet, M E and Fantar, M H (1993) op. cit. n. 19 p 158, Harrison, R J (1988) op. cit. n. 20 p 47. Fernández Castro, M C (1995) Iberia in Prehistory (Oxford) p 184 has suggested that the colonists may in fact not have come from Phoenicia but from Carthage on the basis of their use of well-type burials.

<sup>24</sup> cf Acquaro, E, Aubet, M E and Fantar, M H (1993) op. cit. n. 19 p 159-160.

<sup>25</sup> cf Harrison, R J (1988) op. cit. n. 20 p 47.

<sup>26</sup> cf Acquaro, E, Aubet, M E and Fantar, M H (1993) op. cit. n. 19 p 163; Harrison, R J (1988) op. cit. n. 20 p 47.

Malaka.<sup>27</sup> The most easterly of these early Phoenician settlements is located at Adra (Abdera).<sup>28</sup>

Conventionally these communities are said to have been established in order to facilitate the Phoenician trade in mineral resources with the communities of the Tartessian kingdom. Such was the scale of this trade that Ps.-Aristotle could comment:

Τοὺς πρῶτους τῶν Φοινίκιων ἐπὶ Ταρτησὸν πλεύσαντας λέγεται τοσοῦτον ἀργύριον ἀντιφορτίσασθαι, ἔλαιον καὶ ἄλλον ναυτικὸν ῥῶπον εἰσαγαγόντας, ὥστε ἔχειν δύνασθαι μῆτε ἐπιδέξασθαι τὸν ἄργυρον, ἀλλ' ἀναγκασθῆναι ἀπο πλέοντας ἐκ τῶν τόπων τὰ τε ἄλλα πάντα ἀργυρᾶ οἷς ἐχρῶντο κατασκευάσασθαι, καὶ δὴ καὶ τὰς ἀγύρας πάσας.<sup>29</sup>

Strabo reiterates this view of the silver resources of Tartessos,<sup>30</sup> whilst an indication of the prosperity of the kingdom is afforded by Herodotus when he tells us that the king, Arganthonios gave sufficient wealth to enable the Phocaeans to build a wall around their home city.<sup>31</sup> Similarly Ps.-Scymnos describes Tartessos as being famed for its tin, gold and copper.<sup>32</sup> Unfortunately the precise location of the kingdom of Tartessos has been the matter of considerable debate<sup>33</sup>, although it is now generally

<sup>27</sup> cf Acquaro, E, Aubet, M E and Fantar, M H (1993) op. cit. n. 19 p 168-170.

<sup>28</sup> Strabo 3.4.2-3. On the the chronology of the Phoenician colonies, cf Schubart, H (1982) "Phönizische Niederlassungen an der Iberischen Südküste" in Niemeyer, H G (ed) Phönizier im Westen (Mainz) p 207-231.

<sup>29</sup> Ps.-Aristotle De Mirabilis Auscultationibus 135: "It is said that that those of the Phoenicians who first sailed to Tartessus, after importing to that place oil, and other small wares of maritime commerce, obtained for their return cargo so great a quantity of silver, that they were no longer able to keep or receive it, but were forced when sailing away from those parts, to make of silver not only all the other articles which they used, but also all their anchors." (trans. Loeb ed.). cf Shefton, B B (1982) "Greeks and Greek Imports in the South of the Iberian Peninsula. The Archaeological evidence" in Niemeyer, H G (ed) Phönizier im Westen (Mainz) p 337-368.

<sup>30</sup> Strabo 3.2.11.

<sup>31</sup> Herodotus 1.163.

<sup>32</sup> cf Arribas, A (1963) op. cit. n. 5 p 47.

<sup>33</sup> cf Wagner, C G (1983) "Aproximación al proceso histórico de Tartessos" in AEA 56 p 3-35; Luzón Nogué, J Ma (1962) "Tartessos y la Riá de Huelva" in Zephyrus 13 p 97-104; Fernández Castro, M C (1995) op. cit. n. 23 p 161-170. The kingdom has often been equated with the biblical Tarshish with which Solomon is said to have traded and from which silver, iron, tin and lead reached Tyre. For this topic and the disassociation of Tarshish-Tartessos, cf Aubet, M E (1993) op. cit. n. 5 p 177-179. cf

accepted as having lain in the Guadalquivir Valley. According to Diodorus<sup>34</sup> it was only with the arrival of the Phoenician colonists that these mineral resources came to be exploited and by exchanging silver in return for worthless trinkets the Phoenicians were able to garner a considerable profit. Excavations have testified to the smelting of copper, silver and gold in the Late Bronze Age levels at San Bartolomé de Almonte (Huelva), Quebranthuesos and Niebla,<sup>35</sup> and it seems more probable that the Phoenicians were able to exploit and develop these pre-existing trade routes with the expansion of centres such as Niebla. Such should be borne out by Strabo's description of the Phoenicians exchanging ceramics, ivory, alabaster and bronze vessels with the Tartessians in return for metals and food.<sup>36</sup> Amongst the earliest of the Phoenician colonies is that of Santarém lying about 50 km inland of the R. Tagus which seems to have been occupied from the beginning of the Eighth Century BC.<sup>37</sup> The site appears to have been located in order to exploit the resources of the immediate interior.

Gadir seems to have become involved in this trade from an early date with Phoenician pottery appearing at the Iberian settlement of Castillo de Doña Blanca as early as 770-750 BC, a contact that appears at a number of other Iberian settlements in the Guadalquivir valley, for example Berrueco, Carambolo and Carmona (**fig. 2**).<sup>38</sup> The centre of mining activity seems to have lain in the province of Huelva with a mining settlement dating to the Eighth-Sixth Centuries BC having been excavated at Cerro Salomón on the R. Tinto.<sup>39</sup> Routes running via San Bartolomé de Almonte to the mouth of the Guadalquivir and via Huelva will have provided Gadir with access to these resources, their exploitation being shown by the discovery of a cargo of bronze weapons dated to 750 BC from the Huelva estuary.<sup>40</sup>

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also Rouillard, P (1991) *Les Grecs et la Peninsule Iberique du VIIIe au IVe siècle avant Jésus-Christ* (Paris) p 51-53.

<sup>34</sup> Diodorus Siculus 5.35.4.

<sup>35</sup> cf Ruíz Mata, D (1981) "El poblado metalúrgico de época tartésica de San Bartolomé (Almonte, Huelva)" in *MM* 2 p 154-6; Fernández Castro, M C (1995) op. cit. n. 23 p 168-169.

<sup>36</sup> Strabo 3.2.14.

<sup>37</sup> cf Ridgway, R (1994) "Phoenicians and Greeks in the West: a view from Pithekoussai" in Tsetschladze, G R and De Angelis, F (eds.) *The Archaeology of Greek Colonization: Essays dedicated to Sir John Boardman* (Oxford) p 41.

<sup>38</sup> cf Aubet, M E (1993) op. cit. n. 5 p 230.

<sup>39</sup> cf Blanco, A and Luzón, J M (1969) "Pre-Roman silver mines at Rio Tinto" in *Antiquity* 43 p 124-132.

<sup>40</sup> cf Arribas, A (1963) op. cit. n. 5 p 47; on the trade routes running to Gadir, cf Aubet, M E (1993) op. cit. n. 5 p 238-240.

Although the importance of mineral resources in the establishment of colonial enclaves cannot be denied, it would be incorrect to suppose that such was the sole motivation, the most obvious exceptions to this dictum being those situated at Carthage, Utica, Ibiza and along the eastern coast of Andalusia. Although an area of workshops devoted to working iron has been found within the colony at Morro de Mezquitilla and dated to the Eighth Century BC<sup>41</sup> and Phase IV at Toscanos contained an area devoted to the manufacture of copper and iron goods,<sup>42</sup> metallurgy does not appear to have formed the economic basis of these communities, and only at Villaricos can the extraction of silver ore be dated into the Carthaginian period. Even in areas rich in iron ore such as the Guadalhorce, or at Malaka and Toscanos, where lead and copper resources are known, there is no evidence that these supplies were exploited during the antique period<sup>43</sup>; rather it would appear that these communities were chiefly concerned in achieving self-sufficiency, a function that is inherent in their definition as either colonies or mercantile bases (whether they be *emporion* or the more debated 'Port of Trade').

Unlike Greek colonies, Phoenician settlements are almost exclusively viewed as having been purely commercial entrepôt, the only possible exception being Carthage. The definitions afforded to such within the Greek sphere of influence would, however, better accord with the Phoenician communities having served as genuine colonial settlements.<sup>44</sup> According to Ridgway<sup>45</sup> *emporion* generally formed a mixed community of which the most typical example in the Iberian Peninsula is Emporion. Colonies on the other hand, show signs of social organisation and urban structure. Economically self-sufficient they form an urban centre around which the surrounding hinterland is dependent. In this regard, Niemeyer<sup>46</sup> has proposed the following definition of an urban centre as possessing:

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<sup>41</sup> cf Aubet, M E (1993) op. cit. n. 5 p 259.

<sup>42</sup> cf Aubet, M E (1993) op. cit. n. 5 p 263 - dated to the Seventh Century BC.

<sup>43</sup> cf Aubet, M E (1993) op. cit. n. 5 p 257.

<sup>44</sup> cf Mele, A (1979) *Il commercio greco arcaico: prelexi ed emporie* (Naples).

<sup>45</sup> cf Ridgway, D (1992) *The First Western Greeks* (Cambridge) p 108.

<sup>46</sup> Niemeyer, H G (1990) "The Phoenicians in the Mediterranean: a non-Greek model for expansion and settlement in Antiquity" in Descoedres, J-P (ed.) *Greek Colonists and Native Populations* Proceedings of the First Australian Congress of Classical Archaeology held in honour of Emeritus Professor A D Trendall (Oxford) p 469-490.

- a) a topographic and administrative unity,
- b) a substantial population,
- c) social differentiation and a division of labour,
- d) a structural hierarchy,
- e) an urban life-style,
- f) that the settlement functioned as a centre for the surrounding region.

The Phoenician colonies of the Mediterranean coast of Andalucia are marked by their restricted scale, thus, for example, Cerro del Prado and Cerro del Villar cover only 1 hectare each. Abdera and Morro de Mezquitilla covered 2 hectares and Chorreras extended over 3 ha. Toscanos initially occupied an area of 2.5 ha and only in the Seventh Century BC grew to cover 12-15 ha.<sup>47</sup> Gadir itself covered only 10 ha. Even allowing for a population density of 300 inhabitants per hectare<sup>48</sup> the scale of these communities would imply little more than their employment as *emporía* and harbours for vessels travelling to and from Gadir. It is, however, worth noting that such limited population areas compare well with the scale of communities elsewhere in the Iberian Peninsula, thus for example, the Neapolis of Ampurias covers only 3.6 ha. More important in considering the function of these communities is the evidence afforded for social differentiation and organisation.

Although early colonial settlements appear to have been on a relatively limited scale, we see from the late Eighth Century BC the establishment of more elaborate dwellings such as those at Toscanos, Morro de Mezquitilla and Chorreras,<sup>49</sup> and the growth of more developed economic systems - we have already cited the evidence for metal working taking place in Morro de Mezquitilla as early as the Eighth Century BC. About 700 BC we see the construction at Toscanos of a large central warehouse (Building C).<sup>50</sup> The function of the structure is unclear, although similar centralised markets are found in Near Eastern centres such as Hazor and Megiddo. Although we cannot posit an expansion of Phoenician influence over the hinterland of these

<sup>47</sup> cf Aubet, M E (1993) op. cit. n. 5 p 253.

<sup>48</sup> For the calculation of population densities, cf the appendix. A figure of 100-120 inhabitants is more probable.

<sup>49</sup> cf Aubet, M E (1993) op. cit. n. 5 p 259.

<sup>50</sup> cf Aubet, M E (1993) op. cit. n. 5 p 260-263.

communities, finds of bones from colonies such as Toscanos attest to the importance of agriculture in the local economy with finds of horses, asses, donkeys and cattle, with smaller numbers of dogs, pigs and chickens.<sup>51</sup> The large number of cattle bones found is significant not only in terms of the consumption of the animals and related products, but also as an indication of other agricultural activities such as arable farming with the use of the animals for ploughing and transport. Such is indicated by the finds of large quantities of stone querns used in the preparation of corn in the Phoenician colony at Cerro del Villar<sup>52</sup> and it is worth noting the high regard in which the coastline between Malaga-Almería is held for arable farming. That such activities took place from the beginning of the Phoenician settlement would appear to be indicated by the discovery of bread ovens at Chorreras.<sup>53</sup>

As well as the evidence of social differentiation we can also see a degree of social stratification both through the evidence of increasing elaborate dwellings but also through the necropoleis found adjoining the colonies. The variety of activities thus attested would require a range of professions - farmers, miners, traders and potters to export the resulting products and so forth and the existence of the large warehouse at Toscanos shows that there was already, by 700 BC, a degree of organisation and specialisation, as may also be evidenced by the existence of fortifications at Toscanos during this period.<sup>54</sup> Further to which the appearance of more monumental dwellings at Toscanos, Morro de Mezquitilla and Chorreras points to the growth of a mercantile class within the colonies whose wealth may, at least in part, have come from the agricultural activities which took place within these communities. Although a number of necropoleis have been identified within the vicinity of the Phoenician settlements: at Cerro del Mar near Toscanos, at Trayamar near Morro de Mezquitilla and at Lagos near Chorreras, which are dated to the Seventh Century BC,<sup>55</sup> the most wealthy appear

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<sup>51</sup> cf Aubet, ME (1987) "Notas sobre la economía de los asentamientos fenicios del sur de España" in *Dialoghi di Archeologia* 3rd ser. 5.2 p 58-59: In the late Eighth Century BC (level I) cattle represent 49 % of the domestic faunal remains, with sheep and goats accounting for 42 % and pigs 8.5 %. From c700 BC (level III) there is a considerable increase in cattle (62 %) whilst finds of sheep fall to 27 % and 11 % of the bones attested belonging to pigs. During the Seventh Century BC (levels IV-V) the percentage of cattle found numbers 63-80 % to the detriment of sheep (18-31 %) and pigs (1-5/6 %).

<sup>52</sup> cf Aubet, ME (1987) op. cit. n. 51 p 60.

<sup>53</sup> cf Aubet, ME (1993) op. cit. n. 51 p 61.

<sup>54</sup> cf Niemeyer, H G (1990) op. cit. n. 46 p 483.

<sup>55</sup> cf Aubet, ME (1993) op. cit. n. 5 p 267.

to have been those at Cerro de San Cristobal (Almuñécar).<sup>56</sup> Twenty cremation burials were discovered in excavations undertaken during 1963, the wealth of which were indicated by the use of alabaster jars imported from Egypt.<sup>57</sup> Hieroglyphics on the jars refer to several Pharaohs of the Twenty-Second Dynasty: Osorkon II, Takelot II and Sheshonq III, who ruled Egypt between 874-773 BC. Also found is an example referring to the Fifteenth Dynasty Pharaoh, Apofis I who reigned during the Seventeenth-Sixteenth Centuries BC. A further indication of the extensive commercial contact and the wealth to maintain such may be provided by the incidence of ostrich eggs decorated with geometric designs that were found in tombs 10 and 19.<sup>58</sup> Further alabaster jars have been found at Toscanos and Trayamar although these would appear to have been imitations.<sup>59</sup> Although it is unclear how these goods came to reach the Iberian Peninsula, an indication of the growth of a wealthy mercantile class may be further evidence by the appearance of monumental familial tombs at Trayamar, Toscanos and Almuñécar.<sup>60</sup>

Such communities would appear to have gone beyond the confines of being merely commercial *emporia* and to have functioned as self-sufficient urban communities exercising a degree of control over the surrounding hinterland, thus for example, finds of stone querns at Cerro del Villar point to cereal having been grown over an area of 18 km<sup>2</sup> <sup>61</sup> and it is worth noting the existence of an elaborate monumental complex dedicated to Hercules-Melqart at Gadir.<sup>62</sup> It seems also, however, that use was made of the marine resources available to the colonists.

<sup>56</sup> cf Pellicer Catalan, M (1963) Excavaciones en la necrópolis púnica 'Laurita' del Cerro de San Cristóbal (Almuñécar, Granada) EAE 17 (Madrid).

<sup>57</sup> cf Pellicer Catalan, M (1963) op. cit. n. 56 p 11-40. The only graves to lack such were numbers 4-9, 18 for which no record of finds survives. The only grave for which a genuine absence can be reliably imputed is n. 18, cf p 30. cf also Acquaro, E, Aubet, M E and Fantar, M H (1993) op. cit. n. 19 p 158-159.

<sup>58</sup> cf Pellicer Catalan, M (1963) op. cit. n. 56 p 18, 30-38. Three eggs were found containing ochre. Other imported finds include a silver ring, the centre piece of which is formed by a scarab (tomb 3), proto-Corinthian pottery (tomb 19), a green-glazed scarab (tomb 20). Fernández Castro, M C (1995) op. cit. n. 23 p 184 has suggested that the colonists may in fact have come not from Phoenicia, but from Carthage on the basis of their use of well-type burials.

<sup>59</sup> cf Aubet, M E (1993) op. cit. n. 5 p 270.

<sup>60</sup> cf Aubet, M E (1993) op. cit. n. 5 p 270-271.

<sup>61</sup> On the hinterland of Cerro del Villar, cf Aubet, M E (1991) "Notas sobre las colonias de sur de España y su función en el marco territorial: el ejemplo del Cerro del Villar (Málaga)" in Atti del II Congresso Internazionale di Studi Fenici e Punicci (Rome) vol 2 p 617-626.

<sup>62</sup> cf Aubet, M E (1993) op. cit. n. 5 p 229-230.

Strabo praises the coasts of Andalusia for their wealth of marine life<sup>63</sup> and states that much of the population lived on the sea.<sup>64</sup> Ps.-Aristotle<sup>65</sup> mentions that the voyages of the Gaditanian fishermen lasted for as long as four days. An indication of the extent of the area thus exploited can be gained from Strabo's depiction of Phoenician fishermen as far south as Lixus<sup>66</sup> where an important Phoenician centre appears to have been established<sup>67</sup> both for fishing and to trade ivory and gold with the natives. Also found within the hinterland were sources of copper, iron and lead in the Atlas mountains and salt in the Sahara and at Banasa. The settlement at Mogador on the other hand seems to have been devoted almost exclusively to fishing, with whale bones being amongst the remains found. The site seems only to have been occupied during the Seventh Century BC. A connection between these Mauretanian centres and the settlement at Gadir may be suggested by the coincidence of pottery with sites such as Castillo de Doña Blanca.<sup>68</sup> Further enclaves may be located at Rachgoun and Mersa Madakh in Oran and dated to the Seventh-Sixth Centuries BC.<sup>69</sup> Quantities of fish bones found at Toscanos point to the existence of a specialist class of fishermen, whilst finds of murex shells from Toscanos, Almuñécar and Morro de Mezquitilla allude to the production of purple dye, which although insufficient to form the basis of a quantitative hypothesis would indicate that the salting of fish may also have taken place.<sup>70</sup> Following the breakdown of direct Phoenician influence in the Peninsula about 550 BC - perhaps as a consequence of the economic isolation of Tyre following the fall of the Assyrian empire in 612 BC<sup>71</sup> - we are told by Strabo of the fame of the varieties of preserved fish produced at Sexi, Malaka and Abdera.<sup>72</sup>

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<sup>63</sup> Strabo 3.2.7.

<sup>64</sup> Strabo 3.5.3.

<sup>65</sup> Ps.-Aristotle De Mirabilibus Auscultationibus 136.

<sup>66</sup> Strabo 2.3.4.

<sup>67</sup> cf Aubet, M E (1993) op. cit. n. 5 p 247-248.

<sup>68</sup> cf Aubet, M E (1993) op. cit. n. 5 p 248.

<sup>69</sup> cf Aubet, M E (1993) op. cit. n. 5 p 249.

<sup>70</sup> cf Aubet, M E (1993) op. cit. n. 5 p 264; those molluscs attested from Toscanos are the Patella, Pecten, Venus, Cardium and Murex, cf Schubart, H, Niemeyer, H G and Pellicer Catalan, M (1969) Toscanos: la Factoría paleopúnica en la desembocadura del río Vélez EAE 66 (Madrid) p 149, however, Schüle notes that there is no evidence for the processing of the molluscs and suggests that they may have been used as a form of adornment.

<sup>71</sup> cf Aubet, M E (1993) op. cit. n. 5 p 273-276.

<sup>72</sup> Strabo 3.4.2; cf also Pomponius Mela 2.94.

Although such fish could be consumed either fresh or dried, the apparent scale of the activities attested as well as the evidence for the manufacture of purple dye would point to the use of salting as a method of preservation, in which regard Ps-Aristotle<sup>73</sup> refers to Gaditanian fishermen pickling tunny which would then be shipped to Carthago Nova.<sup>74</sup>

Several Greek sources dated to the Fifth Century BC refer to the existence of Spanish fish sauces.<sup>75</sup> The earliest of these is Eupolis writing in the mid Fifth Century BC who states: *Τάδειρα...Εοπολις Μαρικα πότερ ἦν τὸ τάριχος Φρύγιον ἢ Γαδειρικόν.*<sup>76</sup> From the beginning of the Fourth Century BC, Antiphanes remarks: *τάριχος ἀντακίον εἴ τις βούλετ' ἢ Γαδειρικόν, Βυζαντίας δὲ Θυννίδος ὀσμέϊ σ χαίρει.*<sup>77</sup> Such attestations are important for confirming that by the Fifth Century BC an industry devoted to the salting of fish existed within the Iberian Peninsula and that it was already on a sufficient enough scale to have been exporting to Greece. This trade is attested archaeologically by the discovery in 1978 of the so-called 'Punic Amphora room' at Corinth.<sup>78</sup> Amongst the amphorae recovered were a large quantity of Punic amphorae found associated with the remains of filleted fish. Analysis of the fabric of the vessels showed that they were produced along the Straits of Gibraltar in Southern Spain or NW Morocco. The amphorae from the adjoining levels were dated to the period 460-440 BC on the basis of associated finds of glazed material. The amphorae found here appear to have been related to Mañá-Pascual A-4 vessels from the site of Kuass in Morocco where kilns have been dated as early as the Sixth Century BC.<sup>79</sup> That this trade was reciprocated would appear to be attested by the incidence of

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<sup>73</sup> Ps.-Aristotle *De Mirabilibus Auscultationibus* 136.

<sup>74</sup> Polybius *Histories* x.8.5 states that in 209 BC the populace of Carthago Nova was composed of craftsmen, artisans and 'workers on the sea', although he does not qualify the latter definition.

<sup>75</sup> cf Garcia del Toro, J R (1978) "Garum Sociorum: la industria de salazones de pescado en la Edad Antigua en Cartagena" in *AUM* 36.1-2 p 28-29; cf also Curtis, R I (1991) op. cit. n. 12 p 46.

<sup>76</sup> cf Edmonds, J M (1961) *The Fragments of Attic comedy* (Leiden) Eupolis frg. 186.

<sup>77</sup> cf Edmonds, J M (1961) op. cit. n. 76 Antiphanes frg. 77. cf also Nicostratus, Edmonds frg. 4, 5; Aristophanes *Ranas* 473; Hesychius s.v. ταδειρικον ταριχος - cited by Curtis, R I (1991) op. cit. n. 12 p 46 n. 21, also Euthydemus (apud. Athenaeus 3.116c).

<sup>78</sup> cf Maniatis, Y, Jones, R E, Whitbread, I K, Kostikas, A, Simopoulos, A, Karakalos, Ch and Williams, C K (1984) "Punic amphora found at Corinth, Greece: an investigation of their origin and technology" in *JFA* 11.2 p 205-222.

<sup>79</sup> cf López Pardo, F (1990) "Nota sobre las ánforas II y III de Kuass (Marruecos)" in *Antiquités Africaines* 26 p 13-23. Occupation on the site appears to date back as far as the Seventh Century BC.

Corinthian Koehler A and B amphorae at the Fifth Century BC fish saltery at Avda. de Andalucía, Cadiz.<sup>80</sup> The origin of these amphorae on the Straits of Gibraltar (ie within the Phoenicia sphere of influence) is significant in supporting the hypothesis of a Phoenician impetus behind the development of the industry within the Peninsula.

The similarities between Phoenician fish salting installations and their later Roman counterparts has long meant that it is impossible to securely date any such fishery to the pre-Roman period. Recent excavations on the Bay of Cadiz have, however, located such within the Phoenico-Punic settlements of the South coast.<sup>81</sup> A fish factory has been excavated at Las Redes (Fuentebravía, Puerto de Santa María).<sup>82</sup> The complex extends over an area of 10,70 x 10,60m and consists of five chambers. The first of these appears to have been used in the preparation and dissection of the fish with the soil having been darkened by the decomposition of the organic remains. The second area of the factory possesses a floor composed of pebbles and ground pottery mixed with lime. The area was probably used in the washing of the fish with the floor being inclined towards the sea in order to facilitate cleaning. The third quarter of the structure seems to have been the principal entrance to the complex allowing the arrival of fish and the removal of the amphorae containing the fish sauces. Quantities of fishing implements: hooks, net weights and needles have been found in area four which would, therefore, appear to have been a storage area for the equipment used in the fishing activity of the factory. It is in the fifth area that have been found two basins used in the maceration of the fish. The factory thus conforms to the production processes of salt fish as described by the Geoponica<sup>83</sup> with areas being given over to the washing of the

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<sup>80</sup> cf Muñoz Vicente, A, De Frutos Reyes, G and Berriatua Hernández, N (1987) "Contribución a los orígenes y difusión comercial de la industria pesquera y conservera Gaditana a través de las recientes aportaciones de las factorías de salazones de la Bahía de Cadiz" in Congreso Internacional El Estrecho de Gibraltar (Ceuta) p 489-490.

<sup>81</sup> It is also worth noting the potential for erroneous dating of much of the evidence for this early commerce. Recent C-14 analysis of a lead anchor stock from Berlenga (nr Peniche, Portugal) has dated it to the Punic period (2330 BP ± 45 = Fifth-Fourth Centuries BC), which throws into question the attribution of such wrecks to the Roman period, cf Peixoto Cabral, J M, Meireles, J M, Monge Soares, A M and Verissimo, L (1990) "Datacao pelo radiocarbono de um cepo de ancora em chumbo encontrado na Berlenga" in Conimbriga 29 p 59-68.

<sup>82</sup> cf De Frutos, G Chic, G and Berriatua Hernández, N (1988) "Las Anforas de la factoria preromana de salazones de 'Las Redes' (Puertos de Santa Martia, Cadiz)" in Pereira Menaut, G (ed) Actas 1er Congreso Peninsular de Historia Antigua (Santiago de Compostela) p 295-306; Muñoz Vicente, A, De Frutos Reyes, G and Berriatua Hernández, N (1987) op. cit. n. 80 p 490-496.

<sup>83</sup> On the processing of fish, cf chapter 1.

fish which would then have been cut up, in the case of larger fish such as the tunny, in order to facilitate the impregnation of the fish with salt once it had been placed in a brine solution for a period of two months, or until the mixture had been reduced by two-thirds. In function, therefore, they do not differ from the later Roman fisheries making differentiation on the basis of structural remains alone impossible. From Las Redes, however, four phases of occupation can be defined on the basis of the ceramic evidence:

- Phase I: Represents the earliest occupation of the site, dated to 430-325 BC and seems to have been the period of the principal economic activity with 46 % of the attested ceramic record being dated to this phase.
- Phase II: Corresponds to the period 325-275 BC which seems to have been a period of industrial decline with the progressive diminution of the quantities of ceramics found and in the area of the complex.
- Phase III: Dated to 275-200 BC. This represents the final stage in the occupation of the site with the abandonment of the factory.
- Phase IV: The site was reoccupied during the Seventeenth Century with the construction of a fisherman's house on the site.

Although Las Redes is the most fully understood, a number of other fisheries have been located on the Bay of Cadiz which seem also to have come into use about the mid Fifth Century BC. In 1984-85 the remains of a fishery were located in the Plaza de Asdrúbal, Cadiz.<sup>84</sup> A number of oval basins have been found and dated to the Fifth Century BC. That the fishery engaged in the salting of tunny is confirmed by finds of fish bones within the materials recovered from the basins. There appears to have been a decline in activity on the site during the Fourth Century BC to judge by the paucity of ceramics dated to this period. Production resumes in the Third Century BC to which are dated a series of clay/cement floors which would appear to have been used in the washing and preparation of the fish. The last phase of occupation of the factory is dated to the Second Century BC with the first appearance of Campanian pottery. Similar dates are attested for a factory located in the immediate proximity of the above on the

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<sup>84</sup> cf Muñoz Vicente, A, De Frutos Reyes, G and Berriatua Hernández, N (1987) op. cit. n. 80 p 488-489.

Avda. de Andalucía.<sup>85</sup> Activity on this site can be dated to the Fifth Century BC on the basis of finds of Punic and Greek amphorae (Corinthian Koehler A and B vessels), red varnish wares and Attic pottery as well as fishing implements and bones of tunny indicating the activities concerned. Production seems to have expanded in the Third Century BC with the appearance of various floors of beaten stone and ceramics over the whole site. As with the complex in the Plaza de Asdrúbal, the site seems to have remained in use into the Second Century BC.<sup>86</sup>

Although such activities are only dated to the Fifth Century BC onwards, it seems reasonable to attest their presence within the earlier Phoenician communities. The self-sufficiency of the communities would imply the development of the available economic resources at a specialist level and that fishing was included within this economic development would be confirmed by finds from Toscanos and elsewhere. Any such production would require the development of preservative processes of which the most important was salting. Fishing evidently took place within pre-colonial Iberian settlements although the expansion associated with the Phoenician colonization would have enabled the shift from subsistence production. Edmondson<sup>87</sup> has noted that production and consumption remained within an urbanised settlement and did not feature within the native communities. The commercial links between Gadir and the neighbouring Iberian centres and the proximity of such native settlements to the fisheries may point to the existence of a market for such amongst the natives<sup>88</sup>, although it is impossible to quantify the scale of this commerce in the archaeological record. It is in this regard, however, that we must consider the development of fish salting beyond the regions of Phoenico-Punic influence and the hypothesis that it was

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<sup>85</sup> cf Muñoz Vicente, A, De Frutos Reyes, G and Berriatua Hernández, N (1987) op. cit. n. 80 p 489-490.

<sup>86</sup> As well as the factories cited above, the remains of a single tank, partially destroyed have been found at the junction of Avdas García de Sola and de Portugal, cf Muñoz Vicente, A, De Frutos Reyes, G and Berriatua Hernández, N (1987) op. cit. n. 80 p 490. On the chronology of the Phoenician fish factories, cf Ruiz Gil, J A (1991) "Cronología de las factorías de salazones púnicas de Cádiz" in Atti del II Congresso Internazionale di Studi Fenici e Punici Roma, 9-14 Novembre 1987 (Rome) vol 3 p 1211-1214. The fishery at La Manuela is dated to the late Sixth-end of the Fourth Centuries BC with evidence of continued occupation during the Third Century BC; that of Castillo de Doña Blanca dates from the Fifth to the Third Centuries BC.

<sup>87</sup> cf Edmondson, J C (1990) "Le Garum en Lusitanie urbaine et rurale: hierarchies de demande et de production." in Gorges, J G (ed) Les Villes de Lusitania Romaine (Paris).

<sup>88</sup> cf Castillo de Doña Blanca, also Los Nietos near Carthago Nova and at Santa Pola.

not a Phoenician but a Greek innovation, in which regard it is worth recalling that although the earliest evidence is dated to the Fifth Century BC, it is found within Athenian sources and at a point in which Phoenician control of the South of the Peninsula had collapsed enabling a Greek involvement in markets previously denied to them.

The importance of fishing in the Greek world is well known with the colonies of the Black Sea playing an important role in the development of the salting industry with Strabo<sup>89</sup> describing the natives trading salt in the colony of Dioscurias. Similarly Polybius describes the Black Sea as having an abundance of honey, wax and salt-fish.<sup>90</sup> As early as the Sixth Century BC Cholcis was exporting salt through the medium of bottled sea-water.<sup>91</sup> If the Greek settlements of the Black Sea were engaged in the trading of salt is it reasonable to suggest a similar activity for the colonies of the western Mediterranean? Such an interpretation has, at least, been placed upon the foundation of Massilia.<sup>92</sup>

Herodotus records that the first Greek arrival in the Iberian Peninsula occurred in c638 BC when a certain Kolaïos of Samos was blown off course whilst en route to Egypt and arrived at Tartessos. As a consequence Kolaïos was able to return to Samos a rich man having gained a profit of 60 talents for such a voyage.<sup>93</sup> How much credence should be attached to this tale is difficult to tell, certainly the region was, as we have seen, already extensively exploited by the Phoenicians. Often the colonizing movements of the Greeks and Phoenicians are considered to be mutually opposed (one considers particularly the Battle of Alalia in 535 BC) but it appears rather that there was a degree of integration and co-existence between the two. Thus, for example, we see at Pithekoussai the probable presence of non-Greeks from the Levant within the

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<sup>89</sup> Strabo 11.5.6.

<sup>90</sup> Polybius 4.38.6: "For as regards the necessities of life the lands around the Black Sea provide us with livestock and the bulk of the enslaved, outstanding in quantity and quality, by common agreement. And as regards superfluities, they supply us with an abundance of honey, wax and salted fish."

<sup>91</sup> cf Braund, D (1994) Georgia in Antiquity: a history of Colchis and Transcaucasian Iberian, 550 BC-AD 562 (Oxford), cf also Etienne, R (1970) op. cit. n. 1 p 298.

<sup>92</sup> cf Benoit, F (1959) "L'Économie du litoral de la Narbonnaise à l'Époque Antique: le commerce du sel et les pêcheries" in RSL 15 p 87-110.

<sup>93</sup> Herodotus 4.152.

community.<sup>94</sup> Such commercial interdependence would be evidenced by the Phoenicians' importation of Greek wares into Southern Spain. Such are attested within indigenous settlements from the Eighth Century BC with the earliest Greek find in the Peninsula being a geometric krater dated to 760-730 BC that was found within the Tartessian settlement at Huelva.<sup>95</sup> As we have already seen the Phoenician cemetery of San Cristobál is characterised by the importation of wealthy Eastern goods. Amongst the most frequent Greek finds are those of SOS amphorae which are commonly found at Toscanos, but have also been identified at Morro de Mezquitilla, El Villar, R. Guadalhorce, Huelva, Aljaraque, Cerro de los Infantes, Ilurco (Pinos Puente, Granada) and Ibiza. These amphora are dated from the close of the Eighth Century BC to the first half of the Seventh Century BC.<sup>96</sup> Attic vessels are, as yet, only well attested at Huelva.<sup>97</sup> That some at least of this pottery reached the Peninsula from the settlements of the Central Mediterranean would be suggested by the finds of Etruscan bucchero wares - particularly from Malaga and Cerro del Villar<sup>98</sup>, however, it is impossible to define whether or not these finds are the consequence of individuals such as Kolaios or part of a wider commercial enterprise. The incidence of finds points, however, to the Phoenicians having acted as intermediaries in the exchange of Greek goods into the Peninsula. The centre of this commerce seems to have been the native settlement of Huelva which we have already noted as an important node on the route of supply between the mines of the Guadalquivir and the Phoenician settlements. The high quality of these early Greek imports points to their having been objects of prestige trade which accords with the attested friendship of Arganthonios and the Phocaeans. By c600 BC, however, we see a shift to more commercial transactions with the appearance of

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<sup>94</sup> cf Ridgway, D (1992) op. cit. n. 45 p 111-118. Buchner believes these to have been craftsmen and artisans rather than merchants.

<sup>95</sup> cf Rouillard, P (1991) op. cit. n. 33 p 24.

<sup>96</sup> On the SOS amphorae, cf esp. Johnston, A W and Jones, R E (1978) "The 'SOS' Amphora" in *ABSA* 73 p 103-141; on the distribution of these vessels within the Iberian Peninsula, cf Rouillard, P (1991) op. cit. n. 33 p 26.

<sup>97</sup> cf Rouillard, P (1991) op. cit. n. 33 p 26.

<sup>98</sup> cf Gran Aymerich, J J M (1980) "Cerámicas griegas y etruscas de Malaga: excavaciones de 1980 a 1986" in *AEA* 61 p 201-225; Aubet, M E (1991) "Die phönizische Niederlassung vom Cerro del Villar (Guadalhorce, Malaga): die Ausgrabungen von 1986-1989" in *MM* 32 p 38, 42-43.

amphorae and Attic wares.<sup>99</sup> This coincides with the development of a more established Greek trading axis and the breakdown of the Phoenician commercial hegemony.

It seems reasonable to suggest that access to the mineral rich regions of Tartessos provided a primary motivation for the establishment of permanent Greek settlements in the Peninsula. The earliest Greek colony was established by Phocaeans from Massilia at Emporion.<sup>100</sup> The earliest settlement was founded on the Palaiapolis (modern San Martí d'Empuries) in c600 BC and seems to have acted as an *emporium* trading Greek pottery with the communities of the hinterland.<sup>101</sup> It has been suggested that the early foundation of Emporion may have served as a staging post for Greek vessels heading to Andalucia<sup>102</sup> - such is, however, perhaps better envisaged for the more southerly Greek colonies. It was not long before the colony expanded onto the mainland in the area of the Neapolis and it appears to have established a degree of self-sufficiency and contact with the native communities with Strabo referring to there being two cities: one Greek and the other native.<sup>103</sup> Such contact is perhaps best seen by the import of Greek goods into neighbouring Iberian centres, most notably at Ullastret.<sup>104</sup>

From an early date we see the development of Emporion as a colonial centre with the appearance of monumental architecture, as evidenced by the discovery of an archaic Greek frieze from an Ionic temple, perhaps that of Ephesian Artemis located

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<sup>99</sup> cf Fernández Castro, M C (1995) op. cit. n. 23 p 226-227.

<sup>100</sup> Strabo 3.4.8. There are two traditions of the colonists at Ampurias, as elsewhere along the East Coast, being of either Phocaean or Massiliot origin. Ps.-Scymnos (v.203-204) states that the colony was founded by Phocaeans from Marseilles. A lead inscription from Ampurias dated to the end of the Sixth-mid Fifth Centuries BC written in archaic Ionian script accords with the Phocaean origin attested by Silius Italicus (III.368-9), Livy (34.9, 36.19) and the Elder Pliny (NH III.22). For the inscription, cf Sanmartí, E and Santiago, R A (1987) "Une lettre grecque sur plomb trouvée à Emporion" in *ZPE* 68 p 119-127; cf also Rouillard, P (1991) op. cit. n. 33 p 245. Ps.Scylax (2) and Strabo (3.4.8), however, refer to a Massiliot origin. Eustathius (*ad Iliad* II.561) states that Marseilles is *Ἰταλία μασσαλιώτικη*, cf Ps.-Scymnos v.210, who calls Marseilles a *πολις μεγιστή*.

<sup>101</sup> cf Almagro Basch, M (1964) *Excavaciones en la Palaiápolis de Ampurias* EAE 27 (Madrid) p 76-86. Good relations of the Greeks with the natives may be shown by the marriage of the *oikistes* Euxenos to the daughter of the king Nanos, cf Cunliffe, B (1988) *Greeks, Romans and Barbarians* (London) p 19-23.

<sup>102</sup> cf Shefton, B B (1994) "Massilia and Colonization in the North Western Mediterranean" in Tsetskhladze, G R and De Angelis, F (eds.) *The Archaeology of Greek Colonization: Essays dedicated to Sir John Boardman* (Oxford) p 71.

<sup>103</sup> Strabo 3.4.8, cf also Livy 39.9.1-3.

<sup>104</sup> cf Fernández Castro, M C (1995) op. cit. n. 23 p 230.

beneath the church of Sant Martí de Tours<sup>105</sup>. Evidence of an industrial basis such as fishing, metalworking and ceramic production are also found.<sup>106</sup>

Also located on the Bay of Rosas was the Rhodian colony of Rhode, cited by Strabo<sup>107</sup>, which appears to have been settled during the late Fifth-early Fourth Centuries BC.<sup>108</sup> The extent of the excavations at Rosas are insufficient to allow an understanding of the organisation of the colony and its relationship to Emporion remains unclear.

Strabo refers to the expansion of Greek settlement to the south along the Levantine coast describing the foundation of three Greek colonies between the Sucro (R. Jucar) and Carthago Nova: Hemeroskopeion, Alonis and Akra Leuke (fig. 3).<sup>109</sup> The most important of these is said to have been that of Hemeroskopeion which has yet to be securely identified within the archaeological record. Strabo describes the settlement as possessing as its most prominent feature a temple to Ephesian Artemis located upon a promontory, however, his account is muddled with him equating Dianium with Carthago Nova and stating that the temple of Artemis gave the name Artemisium, or in Latin Dianium, to the colony. Dianium on the contrary is securely equated with Denia on epigraphic grounds and may be derived from an earlier Iberian settlement.<sup>110</sup> Although many authors have chosen to follow Strabo in locating the colony of Hemeroskopeion at Denia citing the presence of Massiliot, Sicilian and

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<sup>105</sup> cf Sanmartí, E and Nolla, J M (1988) *Ampurias* (Barcelona) p 60-62.

<sup>106</sup> cf Dominguez Monedero, A J (1986) "La función económica de la ciudad griega de Emporion" in *Protohistoria Catalana* 6<sup>é</sup> Col.loqui Internacional d'Arqueologia de Puigcerdà, 7-9 de Desembre de 1984, Institut d'Estudis Ceretans (Puigcerdà) p 193-199.

<sup>107</sup> Strabo 3.4.8; 14.2.10.

<sup>108</sup> cf Rouillard, P (1991) op. cit. n. 33 p 288-292; Maluquer de Motes, J (1963) "La colonia griega de Rhode localizada" in *Zephyrus* 14 p 99-100, Villaronga, L (1973) "Presencia Rodia en Rosas (Gerona) a finales del Siglo III a C" in *Ampurias* 35 p 247-248. On the excavations at Rosas, cf Martín, M A, Nieto, F J and Nolla, J M (1979) *Excavaciones en la Ciudadela de Rosas (Campaña 1976 et 1977)* (Gerona).

<sup>109</sup> Strabo 3.4.6.

<sup>110</sup> Hubner has cited the Iberian legend **XIM↑** (Diniu) as the source from which Dianium is derived. This establishes a parallel between Diniu-Hemeroskopeion and Indika-Emporion for the cohabitation of Greek and native settlements. Rouillard, P (1991) op. cit. n. 33 p 300, has pointed out that is in fact DABANIU, therefore making such a etymological source for Dianium impossible. cf also Carpenter, R (1925) *The Greeks in Spain* (Bryn Mawr) p 124, Dixon, P (1940) *The Iberians of Spain* (London) p 29.

Rhodian coinage on the site<sup>111</sup>, further commentators have chosen to locate it elsewhere<sup>112</sup> citing topographical difficulties with the site of Denia as well as the lack of Greek pottery in the vicinity.<sup>113</sup> Most particularly, Rhys Carpenter has chosen to locate the colony at the Peñón d'Ifach, Calpe<sup>114</sup> (pl. 1), referring to the presence of cyclopean walls and quantities of sherds belonging to Hellenistic, Iberian and later red-figure Attic wares<sup>115</sup> dated from the Fifth to Second Centuries BC; and noting also the suitability of the Peñón as a *hemeroskopeio*, or watch-tower. Carpenter's views, however, remain isolated and many choose to retain the location at Denia.<sup>116</sup>

The colonies of Alonis and Akra Leuke are equally problematic. The former is conventionally located at Benidorm<sup>117</sup>, although Rouillard has preferred to locate the settlement at Santa Pola<sup>118</sup>, where Greek pottery dated to the period 450-350 BC has been found. The late date and the lack of Ionian pottery would, however, point against this location. Akra Leuke, on the other hand, is more securely located at Alicante<sup>119</sup>; however, it is conventionally believed to have only been founded as a Carthaginian base in the Third Century BC by Hamilcar and to have only subsequently acquired the Greek name.<sup>120</sup>

The most southerly of the Greek colonies was that of Mainake, the establishment of which was attributed to the Phocaeans by Strabo.<sup>121</sup> Despite being well

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<sup>111</sup> cf Dixon, P (1940) op. cit. n. 110 p 30; Bosch-Gimpera, P (1944) *El Poblamiento Antiguo y la Formacion de los Pueblos de España* (Mexico) p 195; Bosch-Gimpera, P (1944) "The Phocaians in the Far West: an historical reconstruction" in *CQ* 38 p 53.

<sup>112</sup> At locations such as Cullera, Javea and Calpe.

<sup>113</sup> cf Rouillard, P (1991) op. cit. n. 33 p 303: only Pic del Aguila on Montgo has produced sufficient quantities of Greek pottery to be adjudged a settlement.

<sup>114</sup> cf Carpenter, R (1925) op. cit. n. 110 p 117-125.

<sup>115</sup> For the identification of Greek remains on the Peñón, cf Aranegui Gasco, C (1973) "Materiales Arqueologicos del Peñón d'Ifac (Calpe)" in *PLAV* 9 p 49-69.

<sup>116</sup> Gabriella Martin has, however, suggested that Hemeroskopeion does not in fact refer to a single location but rather to any prominent site suitable for use as a harbour for ships, cf Martin, G (1968) "La supuesta colonia de Hemeroskopeion: estudio arqueológico de la zona Denia-Javea" in *PLAV* 3. I regret that I have been unable to consult this source directly, it is cited by Rouillard, P (1991) op. cit. n. 33 p 300.

<sup>117</sup> Carpenter, R (1925) op. cit. n. 110 p 54-55 locates Alonis to the north of Cabo de la Nao, near Javea where he cites the discovery of an Iberian hoard of jewellery and notes that the R. Jalon may recall the Greek name, whilst the R. Gorgos has a strangely ancient ring to it!

<sup>118</sup> cf Rouillard, P (1991) op. cit. n. 33 p 304.

<sup>119</sup> cf Keay, S J (1988) *Roman Spain* (London) p 14, Arribas, A (1963) op. cit. n. 5 p 53, Bosch-Gimpera, P (1944) op. cit. n. 111 p 195.

<sup>120</sup> cf Rouillard, P (1991) op. cit. n. 33 p 287.

<sup>121</sup> Strabo 3.4.2; cf also Ps.-Scymnos v.146-149, Avienus *OM* v.425-431.

attested, the Greek colony is as yet unidentified, although its location is often placed at the mouth of the R. Vélez.<sup>122</sup> Some commentators have chosen to suggest that it was the Hellenised name for Toscanos. Certainly, however, its location within the Phoenician sphere of influence in the south of the Peninsula is agreed upon and it may have been established as part of the earliest Greek arrivals in the region as represented by the voyage of Kolaios. The colony does not seem to have prospered, however, and its abandonment is equated with the defeat suffered by the Greeks at Alalia in 535 BC.<sup>123</sup>

Although the exact nature of these Greek settlements cannot yet be agreed upon, what is clear is that the Eastern coast of the Iberian Peninsula was well exploited by Greek merchants with Rouillard noting that between Saguntum and Murcia twenty sites were found with imported Greek pottery of the Sixth Century BC, a figure that rises to c100 containing Attic imports of the period 450-330 BC.<sup>124</sup> Prior to 600 BC imported Greek pottery is confined to Andalucia, however, with the establishment of Emporion we see the opening up of the East coast to Greek merchants. Through the Sixth Century BC imported wares are widely distributed within coastal communities with particular concentrations in the Ampurdan, the Baix Llobregat, the mouth of the R. Ebro, the Segura valley and the vicinity of Santa Pola, along the Mediterranean coast of Andalucia and at Gadir (fig. 4).<sup>125</sup> A striking exception to this is the attestation of Attic pottery at Medellín on the R. Guadiana, presumably a consequence of the mineral trade. From the Fifth Century BC we see the expansion of Greek imports away from the more isolated distribution that characterised the earlier distribution, and which attests to an intensification of contact and its diffusion into the interior.<sup>126</sup> This is particularly apparent by the Fourth Century BC to which 73.8 % of the Greek pottery found in the Peninsula is dated. Even allowing for the paucity of our knowledge concerning the colonies themselves, it seems clear that there was a strong commercial

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<sup>122</sup> Strabo 3.4.2 takes care, however, to distinguish this site from that of Malaga, cf Laza Palacio, M (1955) "En busca de Mainake" in *AEA* 28 p 104-107; Niemeyer, H G (1980) "Auf der suche nach Mainake: der konflikt zwischen literarischer und archäologischer überlieferung" in *Historia* 29.2 p 165-189; Rouillard, P (1991) op. cit. n. 33 p 294-297.

<sup>123</sup> cf García y Bellido, A (1948) *Hispania Graeca* (Barcelona) vol 2 p 7.

<sup>124</sup> cf Rouillard, P (1991) op. cit. n. 33 p 298.

<sup>125</sup> cf Rouillard, P (1991) op. cit. n. 33 p 108-117.

<sup>126</sup> cf Rouillard, P (1991) op. cit. n. 33 p 117-126.

presence in the Eastern regions of the Peninsula. The initial motivation, at least, for these foundations would appear to have been access to the mineral resources of Tartessos and the establishment of colonies in the vicinity of Cabo de la Nao may have served to exploit this trade following the collapse of more southerly routes following 535 BC. Avienus refers to an unknown location within the area of Alicante as the furthestmost extent of Tartessos<sup>127</sup> whilst the possible Greek settlement of Los Nietos was so sited as to exploit the mineral resources that were located nearby, which if the identification of Ampuritanian pottery on the site is correct, will then have been shipped to Emporion.<sup>128</sup> A further attraction may have been afforded by the quantities of salt and esparto grass (used in the production of ropes and so forth) that were found in the region.<sup>129</sup>

Although Emporion would appear to conform to the criteria established by Niemeyer as having been a colony, the character of the more southerly centres is more difficult to gauge. Some evidence of social stratification may be accorded by Strabo's attestation of the Temple of Artemis within the colony of Hemeroskopeion<sup>130</sup>, whilst some form of urban planning may be hypothesized on the basis of the cyclopean walls on the Peñón d'Ifach.<sup>131</sup> Further to which the wide distribution of Greek pottery within the Iberian communities<sup>132</sup> may point to their having exercised a degree of influence over the surrounding territory. The paucity of the archaeological evidence means, however, that it is impossible to identify genuine colonial settlements along the Levantine coast, rather settlements such as Hemeroskopeion seem to have been located so as to act as harbours for Greek vessels plying the trade between the kingdom of Tartessos and the Phocaeen colony of Massilia.<sup>133</sup>

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<sup>127</sup> Avienus *QM* 462: *Hic terminus quodam stetit Tartessorum.*

<sup>128</sup> cf Shefton, B B (1994) op. cit. n. 102 p 73-73.

<sup>129</sup> cf Fernández Castro, M C (1995) op. cit. n. 23 p 233.

<sup>130</sup> Strabo 3.4.6.

<sup>131</sup> cf Aranegui Gasco, C (1973) op. cit. n. 116115 p 52.

<sup>132</sup> cf, for example, the ceramic records from La Bastida de les Alcuses (Mogente, Valencia) from the Fourth Century, and El Puig (Alcoy) dated to the Fifth-Fourth Centuries BC parallel those found on the Peñón d'Ifach, cf Aranegui Gasco, C (1973) op. cit. n. 115 p 66.

<sup>133</sup> During the Sixth-Fifth Centuries BC the distribution of Massiliot amphorae within the coastal communities may evidence this trade. Their presence at Almuñécar and Huelva as well as in the Balearics (at Cales Coves, Menorca, Pecio del Sec and Bahía de Colonia Sant-Jordi (Mallorca)) may suggest that they were the consequence of Phoenician rather than Greek trade, cf Sanchez Fernandez, C (1987) "Ánforas Masaliotas de la Costa Levantina. Nuevas adquisiciones del Museo Arqueológico Nacional" in *AEA* 60 p 221-229.

It is in regard to the inclusion of Eastern Tarraconensis within the Greek sphere of influence that we must turn to the possibility of a Greek origin for fish salting in the Peninsula. Although the Greeks seem to have consumed Spanish fish sauces and their colonies in the Black Sea seem to have been based, in part, on the exploitation of marine resources, there is less evidence to support the proposition of a Greek origin for the production. *γάρος* is itself a word of Greek origin but Etienne's proposition that this holds true also for the sauce is forced to rely upon the premise that after the Phocaeans introduced the salting of fish to the Peninsula, the scale of Phoenician production led to the association of the processing with the latter.<sup>134</sup>

Beyond the hypotheses of Etienne there is little evidence to support a Greek involvement in the production of fish sauces; one problematic find from the factory at Punta de l'Arenal, however, can be cited as evidence for a Greek presence. Earlier scholars viewed Javea as a Greek settlement dependent upon that of Hemeroskopeion, or as an Iberian settlement (Saetabucula)<sup>135</sup>, there is, however, little evidence to support this. Early this century a marble frieze was uncovered from the town which depicted a horseman preceded by a togate figure and followed by a soldier bearing a shield and spear.<sup>136</sup> Unfortunately the circumstances of its discovery are not known, although it has been suggested that it is a funerary monument<sup>137</sup> and an origin in the necropolis of Muntañar is possible. When originally discovered the piece was believed to have been of Hellenistic date<sup>138</sup>, however, more recently it has been argued that the awkwardness of the figures points to the piece having been of a Roman date.<sup>139</sup> However, the marble appears to be of a local origin and it may be that the alleged 'barbarism' of the piece is the result of local production. Although the dating of the frieze itself cannot be defined,

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<sup>134</sup> cf Etienne, R (1970) op. cit. n. 1 p 299.

<sup>135</sup> cf Diago, F (1617) Anales del Reino de Valencia (Valencia). I regret that at the time of writing I have been unable to consult this source, it is cited by Martin, G (1970) "Las Pesquerias Romanas de la Costa de Alicante" in PLAV 10 p 142, cf also Martin, G and Serres, Ma D (1970) La Factoria pesquera de la Punta de l'Arenal y otros restos romanos de Javea (Alicante) in TV del SIP 38 (Valencia) p 10.

<sup>136</sup> cf Martin, G (1970) op. cit. n. 135 p 11-12, Martin, G and Serres, Ma D (1970) op. cit. n. 135 p 143.

<sup>137</sup> cf Figueras Pachero, F (1945) "Panorama arqueologico de Javea y sus cercanias" in AEA 18 p 8-9.

<sup>138</sup> cf Albertini, E (1911) "Bas-relief grec trouvé a Javea" in Comptes Rendues de l'Academie des Inscriptions et Belles Lettres p 167; cf also Paris, P (1906) "Le Tresor de Javea" in Revue Archeologique 8 p 424.

<sup>139</sup> cf Martin, G (1970) op. cit. n. 135 p 143; cf also García y Bellido, A (1948) op. cit. n. 123.

an association with the Muntañar necropolis would date it to the Roman period.<sup>140</sup> Eastern influences in the vicinity have also been suggested concerning the Iberian finds from La Lluca which show a range of Graeco-Phoenician forms recalling similar pieces from Troy and Mycenae as well as Assyrian decorative styles.<sup>141</sup> Melida has associated it with the sculptures at Cerro de los Santos dated to the Fifth-Fourth Centuries BC and states that it is an import, perhaps from Southern Italy/Sicily.<sup>142</sup> Such pieces are, however, indicative of the “Orientalising” processes of the Iberian communities of the East Coast and cannot be cited in support of a Greek presence in the vicinity.

Any definitive statement of the origins of fish salting in Eastern Spain is impossible with none of the fisheries concerned producing evidence of operation prior to the First Century BC, however, the presence of an established fish salting industry in the Phoenician colonies to the south and the comparable lack of evidence in support of a Greek involvement would tend to suggest the former. Lacking evidence for a salting industry of its own, one must look to the commercial penetration of the East coast for the establishment of a market for fish sauces in the Fifth-First Centuries and it is the supposition of the writer that such processes arrived in the region as a consequence of commercial interaction with the Phoenician colonies.

Evidence for Phoenician trade in the Levant is plentiful with finds of Phoenician pottery reaching Cataluña and Valencia from the Seventh Century BC.<sup>143</sup> The early Phoenician contacts during the Seventh Century BC may have been associated with mineral extraction, as for example, at Torrasa de la Vall de Uxó and Rosell, whilst iron working is attested at Els Castelletts de la Jana.<sup>144</sup> Although we cannot speak of these as colonial settlements, we see by the Fifth Century BC the growth of a number of Iberian

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<sup>140</sup> cf Bolufer i Marques, J (1986) “La Necropolis del Muntanyar” in *Xabiya* 1 p 109-126; Casabo i Bernad, J A (1994) “Resultats de la segona companya d’excavacions d’urgència en la Necropolis Romana del Muntanyar (Xabia, Marina Alta)” in *Xabiya* 7 p 66-75; cf also chapter 3.

<sup>141</sup> cf Paris, P (1906) op. cit. n. 138 p 427.

<sup>142</sup> cf Figueras Pachero, F (1945) op. cit. n. 137 p 16.

<sup>143</sup> cf Blázquez, J M (1983) “Panorama general de la presencia fenicia y púnica en España” in *Atti del I Congresso Internazionale di Studi Fenici e Punici* Roma, 5-10 Novembre 1979 (Rome) vol 2 p 311-373; Mascort, M, Sanmartí, J and Santacana, J (1991) “Aldovesta. Les bases d’un modèle commercial dans le cadre de l’expansion Ibérique” in *Atti del II Congresso Internazionale di Studi Fenici e Punici* Roma, 9-14 Novembre 1987 (Rome) vol 3 p 1076; Oliver Foix, A J (1991) “La presencia Fenicia y Púnica al sur de las Bocas del Ebro” in *Atti del II Congresso Internazionale di Studi Fenici e Punici* Roma, 9-14 Novembre 1987 (Rome) vol 3 p 1094; Llobregat, E A (1977) “Un grafito en escritura punica de la Illeta dels Banyets (El Campello, Alicante)” in *ITEM* 1 p 91-95.

<sup>144</sup> cf Oliver Foix, A J (1991) op. cit. n. 143 p 1097.

centres which display close contacts with the Phoenician colonies: El Cigarralejo, Los Saladares (Orihuela), Villena, Mogente, Pozzo Moro (Albacete), Vinarragell (Burriana), Peña Negra (Crevillente), Castellar de Meca (Ayora, Valencia), Macalón (Nerpio, Albacete), Mas de Mussols, Puig de la Nau (Benicarlo), L' Illa d'en Reixac, Los Villares (Caudete de las Fuentes, Valencia).<sup>145</sup> It has been suggested that the centre at Aldovesta on the mouth of the R. Ebro may have served as a commercial entrepôt on the basis of the quantities of Phoenician pottery found and the limited scale of the settlement itself.<sup>146</sup> Settlements showing Phoenician influences are particularly concentrated in Murcia and the area of the Segura valley: Santa Catalina del Monte, Cobatillas la Vieja, La Majada, Punta de los Gavilanes and Castellar de Librilla, where the pottery recalls that from Morro de Mezquitilla I, Chorerras, Toscanos I and I/II, Los Saladares IA3, Peña Negra I and II b and Cerro de los Infantes IV.<sup>147</sup>

Particularly important in this trade seems to have been the Phoenician colony of Ebusus, said by Diodorus to have been founded in 650 BC.<sup>148</sup> The colony seems to have acted as an intermediary bringing goods from the Phoenician centres of the south into the coastal regions, and after c580 BC to have traded with the communities of the Central Mediterranean.<sup>149</sup> Such contacts may be evidenced by the incidence of Punico-Ebusitanian coins at Mogente, Llíria, Pedréguer, Játiva, Benidorm, La Albufereta, Tossal de Manises, El Molar, Yátova and La Alcudia.<sup>150</sup> Particularly significant in the

<sup>145</sup> cf Oliver Foix, A J (1991) op. cit. n. 143 p 1091, 1095, 1098-1099; Mascort, M, Sanmartí, J and Santacana, J (1991) op. cit. n. 143 p 1078; Mata Parreño, C (1991) "Las cerámicas Fenicias occidentales de los Villares (Caudete de las Fuentes, Valencia)" in Atti del II Congresso Internazionale di Studi Fenici e Punici Roma, 9-14 Novembre 1987 (Rome) vol 3 p 1088-1089; Almagro-Gorbea, M (1991) "El Mundo Orientalizante en la Península Ibérica" in Atti del II Congresso Internazionale di Studi Fenici e Punici Roma, 9-14 Novembre 1987 (Rome) vol 2 p 578; Ros Sala, M M (1991) "Presencia Fenicia en el Área Murciana: los materiales de El Castellar de Librilla (Murcia)" in Atti del II Congresso Internazionale di Studi Fenici e Punici Roma, 9-14 Novembre 1987 (Rome) vol 3 p 1197-1198; Blázquez, J M (1983) op. cit. n. 143 p 317.

<sup>146</sup> cf Mascort, M, Sanmartí, J and Santacana, J (1991) op. cit. n. 143 p 1078.

<sup>147</sup> cf Ros Sala, M M (1991) op. cit. n. 145 p 1198.

<sup>148</sup> Diodorus v.16; archaeological evidence, however, only dates back to the Fifth Century BC with the necropolis of Puig des Molins dating from c500 BC, cf Gómez Bellard, C (1992) "L'Île d'Ibiza dans le commerce en Méditerranée Occidentale à l'Époque Archaique: quelques données nouvelles" in Studia Phoenicia 9 p 299.

<sup>149</sup> cf Maluquer de Motes, J (1969) "Los Fenicios en Cataluña" in V Simposio Internacional de Prehistoria Peninsular (Barcelona) p 246-247; cf also Gómez Bellard, C (1992) op. cit. n. 148 p 308.

<sup>150</sup> On trade between Ebusus and the Levant, cf Llobregat, E A (1974) "Las relaciones con Ibiza en la protohistoria valenciana" in V Symposium de Prehistoria p 291-320: further Eastern finds include scarabs found at La Solivella and El Molar (3 examples) dated to the Fifth Century BC and from La Alcudia de Elche, an Egyptian figurine of Anubis or Horus ? from La Bastida de Alcuses, glazed

role of Ebusus as the principal commercial centre for Phoenician trade in the Levant is the existence of a fish salting industry on the island from an early date, as confirmed by the discovery of a fishery at Cabrera dating to the Fourth Century BC.<sup>151</sup> However, in order to understand the dependency of the Eastern coast upon imported fish sauces during the Punic period, we must turn our attention to the amphorae used within this trade.

## 2. AMPHORAE AND THE PHOENICIAN SALT FISH TRADE.

Numerous problems beset the study of pre-Roman amphorae, hampered as it is by the lack of any systematic attempt to categorize what is a rapidly expanding field of amphorological evidence. Much of the available research has remained within the well formulated typologies of Dressel which have little relevance to the periods outside those evidenced by the deposits of Castro Pretorio upon which his studies were based. As a consequence there exists no systematic formulation of these forms, with many of the studies concerned resorting to the creation of mutually exclusive typologies based upon individual sites; with the result that variations created by the wide productive area which many of these early forms seem to have achieved, have gained a far greater importance and recognition as individual forms than they should in fact have done. Many of the forms remain comparatively sporadic in incidence making it difficult to achieve any understanding of relative scales, areas of distribution, of production and so forth. Many of the vessels of this period are poorly preserved making typological reconstructions difficult. It is with some reticence, therefore, that we must turn our attention to a survey of early amphora production, dealing exclusively with those vessels which are of a Punico-Phoenician ancestry as opposed to Roman which will be more fully discussed in chapter four.

As a basis for the study of Phoenico-Punic amphorae I have chosen to retain the typology of Ebusitanian vessels established by J. Mañá<sup>152</sup> with the important additions

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figurines of Horus from La Albufereta and Tossal de Manises, whilst from La Alcudia there is a corral figure of a Bês.

<sup>151</sup> cf Hernández, Ma J, Angel Cau, M and Orfila Pons, M (1992) "Nuevos datos sobre el poblamiento antiguo de la isla de Cabrera (Balears). Una posible factoria de salazones" in *Saguntum* 25 p 217.

<sup>152</sup> cf Mañá, J (1950) "Sobre tipología de ánforas púnicas" in *VI CASE* (Alcoy) p 203-210.

of R. Pascual.<sup>153</sup> One should be aware, however, that increased systematic excavation is revealing the existence of forms beyond the scope of Mañá's classification although such is still valid as an indication of the families of vessels within which these later forms can be included.

Mañá A amphorae have been defined as either sack or aubergine shaped,<sup>154</sup> and are characterised by an ovoid body, often more pronounced towards the base, no neck, although the lip itself is reinforced and two small spherical handles are attached to the upper reaches of the body of the vessel (**fig. 5.1**). Closely related to these vessels are Mañá B forms which possess the same typological characteristics and seem to represent the evolved form of Mañá A amphorae (**fig. 5.2**).<sup>155</sup> Both forms are widely distributed across the Western Mediterranean and the extent of production may explain their classification as two separate forms. The looseness of Mañá's classification is well evidenced by the inclusion within Mañá C forms of all Punic amphorae possessing a cylindrical body, a long neck and a moulded rim (**fig. 5.3**).<sup>156</sup> Unlike other forms of Punic amphorae these vessels remained in production into the Roman period and are thus classified as Dr 18; more recently, however, the increasing identification of areas of production has meant that the form has been further subdivided: Mañá C 1 a and b, C 2 a, b and c.<sup>157</sup> Mañá D amphorae are characterised by a broad, open mouth with small handles attached to the upper reaches of a shoulderless cylindrical body (**fig. 5.4**).<sup>158</sup> The form is particularly well attested in the Central Mediterranean but appears less commonly within the Iberian Peninsula, although a number of local variants are attested along the East Coast. Mañá E amphorae are conical in form with little

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<sup>153</sup> cf Pascual Guash, R (1969) "Un nuevo tipo de ánfora punica" in *AEA* 42 p 12-19.

<sup>154</sup> cf Mañá, J (1950) op. cit. n. 152 p 204-206, reprinted in Ramón Torres, J (1987) "Sobre los tipos antiguos de las ánforas Mañá A" in *CPAC* 13 p 181-182.

<sup>155</sup> cf Miró i Canals, J (1983) "Algunas consideraciones sobre las ánforas Ibéricas Mañá B 3" in *Pyrenae* 19-20 p 157-158.

<sup>156</sup> cf Guerrero Ayuso, V M (1986) "Una aportación al estudio de la ánforas Púnicas Mañá C" in *Archaeonautica* 6 p 148.

<sup>157</sup> cf Langostana Barrios, L (1996) "Explotación del salazón en la Bahía de Cádiz en la Antigüedad: Aportación al conocimiento de su evolución a través de la producción de las ánforas Mañá C" in *Florentia Iliberitana* 7 p 146.

<sup>158</sup> cf Ramón Torres, J (1983) "Sobre las ánforas tipo Mañá D y su proyección hacia el Occidente Mediterráneo" in *XVI Congreso Nacional de Arqueología* p 507. I regret that I have been unable to consult this source directly, it is cited by De Frutos, G, Chic, G and Berriatua Hernández, N (1988) op. cit. n. 82 p 298 n. 12.

differentiation between the neck and body of the vessel, a pronounced rim and small handles attached to the upper body (fig. 5.5).

Mañá's classification does not, however, take into account either production prior to the Punic settlement of Ebusus (the sample upon which his studies are based) or of the variations that exist within such categories as a consequence of the production of related forms with areas of Phoenicio-Punic influence.

Forms related to the later Punic amphorae are attested in the Eastern Mediterranean from the Eighth Century BC. These are characterised by a cylindrical body tapering into a hollow point with semi-circular handles attached to the join of the neck to the belly of the vessel. Vessels of this type and the variants thereof are found within Israel, Cyprus (Salamina), Phoenicia (Tripoli and Sarepta), Egypt (Tanis) and Carthage.<sup>159</sup> The form is dated in Eastern contexts between the Eighth and Fourth Centuries BC, whilst they are found within tomb four at Trayamar and at Almuñécar where they are dated to the second half of the Seventh Century BC.<sup>160</sup>

Such imports appear to have been concentrated in the Phoenician colonies located upon the Straits of Gibraltar where we see the production of Vuillemont R 1 from the Eighth Century BC and which predominate within the amphorological record of the early colonial settlements.<sup>161</sup> Variants of Vuillemont R 1 amphorae appear to have been produced in Ibiza during the first two thirds of the Sixth Century BC.<sup>162</sup> These forms seem to have evolved into the Mañá A 1 vessels which appear in the south of the Iberian Peninsula from the Eighth Century BC (at Chorreras)<sup>163</sup>. Examples of this form found on Ibiza and classified as PE 11 amphorae bear a vertical groove along the outer face of the handle which is a characteristic of Iberian amphora forms of the Sixth-Fifth Centuries BC.<sup>164</sup> Vessels from Villaricos possess a number of morphological differences from those found on Ibiza with the diameter of the upper body differing

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<sup>159</sup> cf Miró i Canals, J (1983) op. cit. n. 155 p 160-161.

<sup>160</sup> These are classified as Cintas 276, 277, 280 and 283; Trayamar 3 and Almuñécar 1 vessels and appear to have originated in Cyprus from where they were imported to the West.

<sup>161</sup> For the earlier production of Punic amphorae within the Central Mediterranean, cf Ramón Torres, J (1987) op. cit. n. 154 p 184-189.

<sup>162</sup> cf Ramón Torres, J (1987) op. cit. n. 154 p 189.

<sup>163</sup> The vessels are found in Seventh century contexts at Almuñécar, Guadalhorce, Cerro Macareno and Trayamar.

<sup>164</sup> cf Ramón Torres, J (1987) op. cit. n. 154 p 189.

little from the diameter of the broadest point of the belly of the vessel. The base is rounded or conical but unlike the Ebusitanian vessels is not flat. The handles are larger, more arched in profile and smoother than other examples of the form.<sup>165</sup> Also found is a form of Mañá A 1/2 which although similar to the above possesses more oblique shoulders and a clearer differentiation between the neck and body of the vessel. The handles again point to an Iberian origin and they recall Iberian amphorae produced in Cataluña during the Eighth Century BC.<sup>166</sup> In showing clear Iberian as opposed to Punic characteristics of the Central Mediterranean these amphorae attest to a development of Iberian production during the Sixth Century BC. Production of related pieces may also have taken place in North Africa during the Sixth-Fifth Centuries BC.<sup>167</sup> Production of amphorae of this form is attested at Kuass (Ponsich Type I) where it appears to be associated with the operation of kiln four during the Sixth-Fifth Centuries BC.<sup>168</sup> Amphorae of the same type have been found at Cueva del Jarro which appear to have been produced at Kuass and are clearly evolved from the earlier production of Phoenician Vuillemont R 1 vessels.<sup>169</sup> Such vessels are widely found within the Phoenician communities of Southern Spain whilst those from Punta del Nao, Cadíz have been associated with vessels found at Cerro del Macareno, Cadíz and Carmona from the Eighth to Seventh Centuries BC. Related rims have been found from the mid Seventh Century BC levels at Cabezo de San Pedro (Huelva), the first half of the Sixth Century BC at Cerro Macareno, Puente de Noy (Granada) and La Joya (Huelva) as well as Peña Negra (Alicante).<sup>170</sup> These vessels appear to be a prototype for Mañá A 2/3 vessels which are chiefly differentiated from the former by a clear line dividing the body from the shoulder of the vessel.

Although production of these amphorae is concentrated within Southern Spain, a number of local variants of Mañá A 1/2 containers can be seen along the coasts of

<sup>165</sup> cf Ramón Torres, J (1987) op. cit. n. 154 p 192.

<sup>166</sup> cf Ramón Torres, J (1987) op. cit. n. 154 p 192.

<sup>167</sup> cf Ramón Torres, J (1987) op. cit. n. 154 p 194-195.

<sup>168</sup> cf Ponsich, M (1969) "Note préliminaire sur l'industrie de la céramique Préromaine en Tingitane" in *Karthago* 15 p 84; cf also López Pardo, F (1990) op. cit. n. 79 p 14.

<sup>169</sup> cf Ramón Torres, J (1987) op. cit. n. 154 p 195-196.

<sup>170</sup> cf Alonso Villalobos, C, Florido Navarro, C and Muñoz Vicente, A (1991) "Aproximación a la tipología anfórica de la Punta del Nao (Cadiz, España)" in *Atti del II Congresso Internazionale di Studi Fenici e Punici* Roma, 9-14 Novembre 1987 (Rome) vol 2 p 602-603.

Cataluña and Languedoc: at Ampurias, Pech Maho, Cayla de Mailhac, Montlaurès, La Monédière de Bessan, La Moulinasse de Salle d'Aude, Mont Garou and Negrel.<sup>171</sup> These attest to the influence of the Phoenicians within the East Coast, even in areas more readily associated with the Greek presence, and provide the origin for the later production of flat bottomed forms within the region. Ribera 1 amphorae produced in Valencia seem also to be related to Mañá A 1 amphorae dated to the Fourth-Third Centuries BC.

A further form has been identified as being produced at Kuass during the Fifth-Third Centuries BC: Mañá-Pascual A 4 (fig. 6.2-3).<sup>172</sup> These appear to have developed from the production of Mañá A 2/3 and Molina-Huertas VI and appear within Southern Spanish contexts from the Sixth Century BC.<sup>173</sup> These vessels seem to have been produced in the Bay of Cadíz in which area they are particularly associated with sites devoted to the processing of fish.<sup>174</sup> The earliest examples of this form are found in burials at the Plaza de Asdrúbal and at Cerro Macareno where it is dated to the Fourth Century BC.<sup>175</sup> It is particularly prominent in all levels of occupation of the fishery of Las Redes where it is the most common form (41 %) - and where it is dated from the last third of the Fifth Century BC to the Second Century BC.<sup>176</sup> They are found alongside Mañá A 1, Koehler B, Pellicer B, C and D, E 1 and E 2, Mañá C 2b and Mañá D amphorae within the fishery at Plaza de Asdrúbal dated between the Fifth and Second Centuries BC,<sup>177</sup> a similar date to that of the fishery at Avda. de Andalucía.<sup>178</sup> Production of this form takes place at Kuass where it is eventually superseded by Mañá C/Dr 18 amphorae, although its predominance in the Bay of Cadíz region would point to its having been produced there also, despite no kilns having yet been identified.

That the form was traded to the East Coast is indicated by its appearance at La Bastida de les Alcuses (Alicante),<sup>179</sup> Ampurias and Ullastret (Gerona),<sup>180</sup> and it seems

<sup>171</sup> cf Ramón Torres, J (1987) op. cit. n. 154 p 197.

<sup>172</sup> cf López Pardo, F (1990) op. cit. n. 79 p 22.

<sup>173</sup> cf Ramón Torres, J (1987) op. cit. n. 154 p 196 n. 46.

<sup>174</sup> cf De Frutos, G, Chic, G and Berriatua Hernández, N (1988) op. cit. n. 82 p 300 type L.

<sup>175</sup> cf Muñoz Vicente, A, De Frutos Reyes, G and Berriatua Hernández, N (1987) op. cit. n. 80 p 500.

<sup>176</sup> cf De Frutos, G, Chic, G and Berriatua Hernández, N (1988) op. cit. n. 82 p 300.

<sup>177</sup> cf Muñoz Vicente, A, De Frutos Reyes, G and Berriatua Hernández, N (1987) op. cit. n. 80 p 488.

<sup>178</sup> Where the form is found alongside Koehler A and B, E 1 and E 2, Mañá D 1a and D 2 vessels, cf Muñoz Vicente, A, De Frutos Reyes, G and Berriatua Hernández, N (1987) op. cit. n. 80 p 489-490.

<sup>179</sup> cf Llobregat, E A (1974) op. cit. n. 150 p 136.

likely that Ibiza acted as an intermediary in the exchange of vessels for this form with the communities of the Levant. Significant in this regard is the wreck of Togomago I which was discovered in 1980 off Cap Roig, Ibiza and dated to the period 500-450 BC.<sup>181</sup> The principal cargo of this vessel appears to have been Mañá-Pascual A 4 amphorae, the origin of which appears to have been the colonies of the south coast with the fabric of the vessels matching that of Vuillemont R 1 amphorae produced at Chorreras or Toscanos.<sup>182</sup> The Mañá-Pascual A 4a found are identical to vessels found at Cartagena, Colmenar (Malaga) and Cueva del Jarro.<sup>183</sup> The wrecksite of Cabrera B provides an indication of the diversified character of Punic trade with a range of Punic forms being attested: Mañá A, B, C 1a, D and E as well as Greco-Italic amphorae which, it has been suggested, originated in Cataluña. The pottery found includes Black-gloss vessels produced at Rosas in the period 300-225 BC as well as several wares which may have come from Ibiza.<sup>184</sup>

As well as a trading axis running to the north via Ibiza to Cataluña, these vessels seem also to have been traded with the Eastern Mediterranean for which we have already referred to the discovery of Mañá-Pascual A 4 amphorae with the 'Punic Amphora Room' at Corinth, which the excavators believed to have originated with similar material from Adra and Cueva del Jarro.<sup>185</sup> Perhaps related to this trade is the wreck of Punta di San Francesco off Lipari in the Aeolian Islands, which appears to have carried a cargo of Mañá A 3/4 amphorae.<sup>186</sup>

A further variant of this form has been noted, namely Mañá A 5 which are characterised by a ovoid body, with short thickened rims, oval handles and a conical base. The form is widely found in Andalucía: Jerez, Huelva, Itálica and Cadiz as well as

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<sup>180</sup> cf Ramón Torres, J (1985) "Togomago I: Un pecio Fenicio del siglo Va.C en aguas en Ibiza" in VI CIAS Cartagena 1982 (Cartagena) p 385.

<sup>181</sup> cf Ramón Torres, J (1985) op. cit. n. 180 p 377-391.

<sup>182</sup> cf Ramón Torres, J (1985) op. cit. n. 180 p 380.

<sup>183</sup> cf Ramón Torres, J (1985) op. cit. n. 180 p 384.

<sup>184</sup> cf Parker, A J (1992) Ancient Shipwrecks of the Mediterranean and the Roman Provinces BAR Int Ser 580 (Oxford) p 80-81.

<sup>185</sup> cf Ramón Torres, J (1985) op. cit. n. 180 p 384.

<sup>186</sup> cf Parker, A J (1992) op. cit. n. 184 p 352. Also perhaps worth noting is the wreck at Comino, Malta, cf Parker, A J (1992) op. cit. n. 184 p 153, whilst the incidence of Koehler A and B amphorae within the wreck at Gela may indicate the reciprocity of this trade, cf Parker, A J (1992) op. cit. n. 184 p 188-189. Mañá-Pascual A 4 have also been found to constitute the cargo of the Punta Leone wreck lying off the Moroccan coast, where they are dated to the Third Century BC, cf Parker, A J (1992) op. cit. n. 184 p 355.

in the Balearics and along the East Coast, where they are dated to the Fifth-Second Centuries BC.<sup>187</sup>

We have already referred to the coincidence of Mañá-Pascual A 4 and the fisheries of the Bay of Cadíz and a function related to these can be applied to the form as a whole. The production of vessels of this type at Kuass would appear to be related to the supply of the nearby fish factories at Tahadart, Zili and Ad Mercuri, as well as being attested at Ceuta and Lixus.<sup>188</sup> The kilns may even have supplied the Spanish fisheries as may be indicated by the appearance of coarse wares from Kuass at Plaza de Asdrúbal.<sup>189</sup> Such an hypothesis is confirmed by the identification of salted fish within the Mañá-Pascual A 4 amphorae at Corinth. The coincidence of these vessels with the development of the fisheries of the Bay of Cadíz would, therefore, suggest that the expansion of these amphora represents the growth of Punic commerce following the appearance of Greek settlement in the Southern Peninsula.

Mañá B amphorae were originally classified on the basis of their incidence on Ebusus as possessing an ovoid or conical profile, cylindrical in shape with a pointed base, a small rimmed mouth and two small handles positioned high up on the shoulder of the vessel near the mouth.<sup>190</sup> Further studies have drawn attention to Mañá B 3 amphorae in Cataluña and Languedoc during the Fourth-Third Centuries BC and it has been suggested that the form was produced along the coast of NE Spain.<sup>191</sup> As with Mañá A vessels the origin of this form appears to have been the Eastern Mediterranean being identified over much of the Western Mediterranean from the Fourth Century BC. Examples have been found with Mañá A vessels within the tophet at Tharros and at Olbia dated to the Second-First Centuries BC. It is widely found in Sicily, those from the fish factory of San Vito being dated to the end of the Fourth Century BC and

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<sup>187</sup> cf Alonso Villalobos, C, Florido Navarro, C and Muñoz Vicente, A (1991) op. cit. n. 170 p 607.

<sup>188</sup> cf Langostana Barrios, L (1996) op. cit. n. 157 p 146-147.

<sup>189</sup> cf Muñoz Vicente, A, De Frutos Reyes, G and Berriatua Hernández, N (1987) op. cit. n. 80 p 488. On the relationship between fisheries and amphora production in Morocco and Southern Spain, cf Ponsich, M (1975) "Pérennité des relations dans le circuit du Détroit de Gibraltar" in *ANRW* II.3 p 655-684.

<sup>190</sup> cf Miró i Canals, J (1983) op. cit. n. 155 p 157.

<sup>191</sup> cf Miró i Canals, J (1983) op. cit. n. 155 p 158; cf also Jully, J J (1975) "Koiné commerciale et culturelle phénico-punique et Ibéro-languedocinne en Méditerranée Occidentale à l'Âge du Fer" in *AEA* 48 p 22-94.

beginning of the Third Century BC.<sup>192</sup> Those from Trepucó on Menorca are dated to the Third-Second Centuries BC,<sup>193</sup> where they are found with Ampuritanian grey ceramics and Iberian painted wares. Ribera has identified vessels of this type in Fourth-Third Century BC contexts in Valencia.<sup>194</sup> The form is particularly common in the Guadalquivir where it is viewed as a Turdetanian vessel. Its presence at Cerro Macareno is dated to the Fifth-Second Centuries BC, at Cabezo de San Pedro de Huelva to the Fourth-Second Centuries BC and at Tiñosa to the Third Century BC.<sup>195</sup> It is noted that many of these vessels are of a local origin and appear to represent the indigenous manufacture in response to Phoenicio-Punic prototypes from the Fifth-First Centuries BC. A corollary of this widespread incidence is that many of the regional forms are classified in their own right, those produced in Cataluña being termed Mañá B 3 and it is with these that the bulk of our interest is concerned. We see the importation of Mañá A 1 vessels into Cataluña from the Seventh Century BC in imitation of which the Iberian communities begin producing Mañá B 3 whilst similar vessels, classified as PE 1 amphorae appear in Ibiza from the Fifth Century BC.<sup>196</sup> As regards evidence of production a complex of kilns have been excavated at Can Badell (Bigues, Vallès Oriental) which produced Mañá B 3 forms from the end of the Fourth Century BC to the end of the Second Century BC. B 3 vessels also predominate within the three kilns identified at Santa Cecília, near Mataro, where Republican amphorae have dated the site to the Second-First Centuries BC.<sup>197</sup> It seems likely that further production is located within the vicinity of Molins del Rei, perhaps within the nearby Iberian community of Santa Creu d'Olorde which was occupied from c200 BC.<sup>198</sup> The earliest examples of the form appear at the necropolis Martí at Ampurias c400 BC,

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<sup>192</sup> cf Purpura, G (1982) "Pesca e stabilimenti antichi per la lavorazione del pesce in Sicilia: I-S. Vito (Trapani), Cala Minnola (Levanzo)" in *Sicilia Archaeologica* 15.48 p 53

<sup>193</sup> cf Miró i Canals, J (1983) op. cit. n. 155 p 165.

<sup>194</sup> cf Ribera Lacomba, A (1982) *Las ánforas preromanas en el País Valenciano: Fenicias, Ibéricas y Púnicas* TV del SIP 73 (Valencia) fig. 35: La Bastida de Moixent, La Alcudia, el Puig de Alcoy, Sant Miquel de Lliria, Tossal de Manises, La Serreta; cf also Llobregat, E A (1974) op. cit. n. 150 p 137.

<sup>195</sup> cf Miró i Canals, J (1983) op. cit. n. 155 p 166.

<sup>196</sup> cf Miró i Canals, J (1983) op. cit. n. 155 p 172.

<sup>197</sup> cf Miró i Canals, J (1983) op. cit. n. 155 p 172-173.

<sup>198</sup> A deformed vessel of this type is preserved in the Museo de Molins del Rei, cf Miró i Canals, J (1983) op. cit. n. 155 p 173.

whilst they are attested with Dr 1 amphorae at the Sa Tuna wreck dated to the First Century BC.<sup>199</sup>

The ubiquity of this form attests to its commercial importance in which regard they appear to have been widely traded. Thus, for example, Mañá B vessels are found with Massiliot forms within the Grand Bassin A wreck dated to 350-250 BC.<sup>200</sup> The wreck appears to have originated in Cataluña with the appearance of Iberian painted vessels as well as two so-called 'imitation Campanian' cups of the Nikias-Ion type which appear to have been produced within the North-East. That Ebusus was again an important centre in the Punic trade with Cataluña would be attested by the Cala Binisafuller wreck dated to the early Second Century BC. Most of the cargo of 150 amphorae are of Mañá B 3 forms originating in Cataluña. There are also a small quantity of A 3 and E vessels (Ebusitanian types PE 14 and PE 15). Campanian A pottery and a Sardinian amphora have been found and perhaps represent the ship's stores rather than cargo.<sup>201</sup> Mañá B 3, B 1 or C 1 and Greco-Italic amphorae have been found within the Terrasini B wreck and may indicate that Mañá B amphorae were included in the wider commercial contacts of the Mañá-Pascual A 4 forms discussed above.<sup>202</sup>

Although Miró<sup>203</sup> has noted that Mañá B 3 vessels were produced in those regions later characterised by the manufacture of Laietanian wine amphorae types (Pascual 1 and Dr 2-4), there is little indication of the contents of these vessels. They are often found associated with silos such as those at Montjuic<sup>204</sup> which were a feature of Iberian settlement in Cataluña: 230 silos containing Mañá B 3 amphorae were excavated within the settlement at Ullastret.<sup>205</sup> Such silos were used in the storage of grain, for which Gerona was particularly noted and it possible that Mañá B amphorae

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<sup>199</sup> cf Foerster Laures, F (1974) "Spain. Sa Tuna and Los Ullastres (Gerona)" in *IJNA* 3 p 332-333; appearances of the form elsewhere in Cataluña are dated to the Fifth-Third Centuries BC, cf Miró i Canals, J (1983) op. cit. n. 155 p 174-177. For the wreck at Ses Salines (Estartit), cf Parker, A J (1974) "Lead ingots from a Roman ship at Ses Salines, Majorca" in *IJNA* 3.1 p 147-150.

<sup>200</sup> cf Parker, A J (1992) op. cit. n. 184 p 198.

<sup>201</sup> cf Parker, A J (1992) op. cit. n. 184 p 73-74. Also worth reiterating is their appearance in the Cabrera B wreck where a Catalan origin is also possible, cf Parker, A J (1992) op. cit. n. 184 p 80-81.

<sup>202</sup> cf Parker, A J (1992) op. cit. n. 184 p 422.

<sup>203</sup> cf Miró i Canals, J (1983) op. cit. n. 155 p 173.

<sup>204</sup> cf Miró i Canals, J (1983) op. cit. n. 155 p 183.

<sup>205</sup> cf Miró i Canals, J (1983) op. cit. n. 155 p 185.

were used in the movement of such. The silos at Argelia date from the Fourth Century BC, whilst those at Turó del Vent and Ullastret are dated to the Third Century BC and may thus indicate the expansion of cereal production in the region at this time - perhaps as a consequence of the establishment of a permanent Roman military presence in the region. Coincident with this is the appearance of Mañá B 3 production within the vicinity perhaps in order to meet these wider commercial requirements.

The production of vessels related to Mañá A amphorae does not, however, appear to have been confined to Mañá B with the identification of a kiln producing Ebusitanian PE 15 amphorae at Darro (Vilanova i la Geltrú) (fig. 6.1).<sup>206</sup> Three kilns have been identified, two dated to the Third-Second Centuries BC and the Third to the Second Century BC.<sup>207</sup> PE 15 vessels are produced on Ibiza during the Fourth-Second Centuries BC and are conventionally associated with the transport of wine.<sup>208</sup> The importance of this site in confirming the economic role of Ibiza in the Punic trade with Cataluña and the East Coast is confirmed by the widespread incidence of Ebusitanian amphorae along the Mediterranean coast of the Peninsula.<sup>209</sup>

Mañá C amphorae are significant in providing a link between Punic and Roman production being an early form of Dr 18 amphora and thus spanning an apparent lacuna in evidence pertaining to fish sauce production between the Second and First Centuries BC.<sup>210</sup> Originally identified by Dressel at Castro Pretorio and classified by Mañá on the basis of the deposits from Ibiza, the intensification of archaeological investigation in recent years has led to the identification of a series of variants: Mañá C 1a and b, Mañá C 2a, b and c. Generally speaking, however, the various types possess a number of common characteristics: a cylindrical body, a pointed base, strong semi-circular handles that are circular or oval in section. It is in the profile of the mouth of the vessel that we

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<sup>206</sup> cf López Mullor, A and Fierro Macía, J (1990) "Un horno con ánforas de tipo Púnico-Ebusitano hallado en Darró (Vilanova i la Geltrú, Barcelona) in El Mundo Púnico. Historia, Sociedad y Cultura Coloquios de Cartagena (Cartagena) p 443-463.

<sup>207</sup> cf López Mullor, A and Fierro Macía, J (1990) op. cit. n. 206 p 448.

<sup>208</sup> cf López Mullor, A and Fierro Macía, J (1990) op. cit. n. 206 p 451, 454.

<sup>209</sup> For a catalogue of such, cf López Mullor, A and Fierro Macía, J (1990) op. cit. n. 206 p 456-458.

<sup>210</sup> Langostana Barrios, L (1996) op. cit. n. 157 p 142 has preferred a breakdown in fish salting activity between the second half of the Third Century BC and the beginning of the Second Century BC which coincides with the Roman conquest of the coastal regions. I would, however, prefer a later date with the continuation of both the attested fish factories on the Bay of Cadíz and of Punic Mañá-Pascual A 4 fish sauce amphorae until the late Second-First Centuries BC.

see the principal typological differentiation. Mañá C 1a amphora are characterised by only a slight distinction between body and shoulder, the neck is relatively undifferentiated and the mouth is characterised by a plain, vertical moulded rim.<sup>211</sup> Mañá C 1b amphora are essentially similar in body to but differ from the form above by their more complex mouth consisting of an angular rim moulded in two parts.<sup>212</sup> Related to this are a series of similar amphorae classified by Guerrero Ayuso as Mañá C 1/2 which appear in the period c200/190-150 BC.<sup>213</sup> More widely attested are Mañá C 2 amphorae of which three variants have been identified. Mañá C 2a vessels possess a pronounced ('spine-like') point, a cylindrical body, a broad neck surmounted by a wide mouth and pronounced rim.<sup>214</sup> Mañá C 2b forms are differentiated from the above by a longer point and a less elaborate rim.<sup>215</sup> Mañá C 2c are less widely attested than the above forms and are marked by a less complex rim form and a more tapered body ending in a less pronounced point.<sup>216</sup>

Examples of the form are widely attested throughout the Western Mediterranean<sup>217</sup> with particular concentrations in the coastal communities of southern Spain. Mañá C 1a vessels have been found in a late Fourth Century BC context at Ampurias and at Ullastret;<sup>218</sup> Mañá C 1b at Ampurias;<sup>219</sup> Mañá C 2a and b vessels appear at Ampurias<sup>220</sup>, Denia<sup>221</sup>, Riells-La Clota (Ampurias)<sup>222</sup>, Torre de la Sal, Burriana<sup>223</sup>, Isla Grosa (Cabo de Palos, Cartagena)<sup>224</sup>, Benidorm<sup>225</sup>, Valencia.<sup>226</sup> As

<sup>211</sup> cf Guerrero Ayuso, V M (1986) op. cit. n. 156 p 149. Guerrero Ayuso has suggested that they are evolved from the Cintas 268 amphorae dated to the Eighth Century BC.

<sup>212</sup> cf Guerrero Ayuso, V M (1986) op. cit. n. 156 p 156.

<sup>213</sup> cf Guerrero Ayuso, V M (1986) op. cit. n. 156 p 160-161.

<sup>214</sup> cf Guerrero Ayuso, V M (1986) op. cit. n. 156 p 163-164.

<sup>215</sup> cf Guerrero Ayuso, V M (1986) op. cit. n. 156 p 170-172.

<sup>216</sup> cf Guerrero Ayuso, V M (1986) op. cit. n. 156 p 176.

<sup>217</sup> cf Langostana Barrios, L (1996) op. cit. n. 157 p 145.

<sup>218</sup> cf Guerrero Ayuso, V M (1986) op. cit. n. 156 p 152.

<sup>219</sup> cf Guerrero Ayuso, V M (1986) op. cit. n. 156 p 158.

<sup>220</sup> cf Guerrero Ayuso, V M (1986) op. cit. n. 156 p 165.

<sup>221</sup> cf Gisbert Santonja, J M (1985) "Hallazgos Arqueologicos submarinos en la costa de Denia. Las Anforas de cronologia Romana Republicana" in VI CIAS Cartagena 1982 (Cartagena) p 419 n. 15, 420 n. 16.

<sup>222</sup> cf Nolla i Brufau, J M and Nieto Prieto, F J (1985) "El yacimiento arqueologico submarino de Riells-la Clota y su relacion con Ampurias" in Cypsela 5 p 148.

<sup>223</sup> cf Fernandez Izquierdo, A (1982) "Estudio del trafico maritimo en la costa de Castellon. A traves de la Arqueologia Submarina" in Saguntum 17 p 115.

<sup>224</sup> cf Mas, J (1985) "El Poligono Submarino de Cabo de Palos. Sus Aportaciones al estudio del trafico maritimo antiguo" in VI CIAS Cartagena 1982 (Cartagena) p 169.

<sup>225</sup> cf Llobregat, E A (1974) op. cit. n. 150 p 138.

with the earlier forms of Punic amphorae the frequency of these vessels within the Balearics suggests that Ibiza played a pivotal role in the supply of these forms to the regions of Eastern Spain.

As regards the production of these vessels, Mañá C 1 seem to have originated in the Central Mediterranean.<sup>227</sup> Production of Mañá C 2 has been identified at Kuass (Ponsich Type IV)<sup>228</sup> where they appear to have replaced the earlier production of Mañá-Pascual A 4 on the site in the Second Century BC.<sup>229</sup> Production of this form, however, seems to have been concentrated in the Bay of Cadíz where it is associated with later Roman fish sauce amphorae.<sup>230</sup> Production at Torrealta (San Fernando, Cadíz) is dated to the Fourth-Second Centuries BC,<sup>231</sup> a date that accords well with the evidence afforded from elsewhere. Mañá C 1 variants appear from Fourth Century BC,<sup>232</sup> whilst Mañá C 2 forms appear with Dr 1 amphorae dated to the Second-First Centuries BC.<sup>233</sup> The principal phase of production seems to have been during this period with the form being found in conjunction with Dr 7-11 amphorae at Bolonia and Cerro del Mar, whilst several kiln sites such as those at Los Sauces and Buenavista seem only to have engaged in the production of Dr 7-11 and Mañá C.<sup>234</sup>

The association of this form with later Roman fish sauce amphorae is confirmed by the evidence afforded by the vessels themselves. Mañá C 1 vessels from the Cabrera II wreck possess a resin lining,<sup>235</sup> although Keay has preferred to propose that Mañá C 1b carried oil.<sup>236</sup> The presence of a resin lining in Mañá C 2 vessels from Na Guardis

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<sup>226</sup> cf Fernandez Izquierdo, A (1984) Las Ánforas Romanas de Valentia y de su entorno marítimo (Valencia) p 33, 36.

<sup>227</sup> Perhaps on Malta and at Carthage for the two variants respectively, cf Guerrero Ayuso, V M (1986) op. cit. n. 211 p 178.

<sup>228</sup> cf Ponsich, M (1969) op. cit. n. 168 p 85.

<sup>229</sup> cf López Pardo, F (1990) op. cit. n. 79 p 20-22.

<sup>230</sup> cf Langostana Barrios, L (1996) op. cit. n. 157 p 148-150.

<sup>231</sup> cf Langostana Barrios, L (1996) op. cit. n. 157 p 147.

<sup>232</sup> cf Ustica B - c350-250 BC, cf Parker, A J (1992) op. cit. n. 184 p 441; Secca di Capistello, with Greco-Italic and Mañá C 1b vessels - c300-280 BC, cf Parker, A J (1992) op. cit. n. 184 p 396.

<sup>233</sup> The form is found with Dr 1c amphorae at Cap Negret dated to c110-90 BC, cf Parker, A J (1992) op. cit. n. 184 p 105-106; with Mañá D and Dr 1 vessels at Olbia, cf Parker, A J (1992) op. cit. n. 184 p 293-294. Mañá C, Greco-Italic and Dr 1 amphorae have been identified at Cala Gadir dated to the Second Century BC, cf Parker, A J (1992) op. cit. n. 184 p 88-89; whilst they are associated with Baetican Dr 24 vessels at Ustica A, cf Parker, A J (1992) op. cit. n. 184 p 441.

<sup>234</sup> cf Langostana Barrios, L (1996) op. cit. n. 157 p 152.

<sup>235</sup> cf Guerrero Ayuso, V M (1986) op. cit. n. 156 p 156.

<sup>236</sup> cf Keay, S J (1984) Late Roman Amphorae in the Western Mediterranean BAR Int. Ser. 196 (I) p 408.

and Porto Pi would point to their having been used to carry either wine or fish sauce, the latter being most probable considering their discovery containing fish bones at Cerro del Mar.<sup>237</sup> They have also been found within the fish factory at Plaza de Asdrúbal where they are dated to the Second Century BC,<sup>238</sup> as well as with fish tanks at Belo and Cerro del Mar.<sup>239</sup> The relationship of this form with the continued production of fish sauce into the Roman period is confirmed by a Mañá C 2b vessel from Castro Pretorio which bears a *titulus pictus* reading either HAL(lex) COC(tiva) or HAL(lex) SOC(iorum).<sup>240</sup> Also worth noting is the appearance of Mañá C vessels within the wreck at Torre la Sal, Cabanes<sup>241</sup> which contain animal bones and thus presumably salted meat. Similarly, Phoenician Bartolini B, C and D amphora of the Seventh-Sixth Century BC have been found carrying salted meat within the Coltellazzo A wreck.<sup>242</sup> Some of the Punic amphora (Mañá C 2b and D) at Olbia contain animal bones.<sup>243</sup> It would appear, therefore, that not only did the Phoenicians engage in the exchange of salted fish products, but that other forms of meat were also utilised - a consideration particularly important during the Roman period when we will consider the functioning of the fisheries outside the tunny season.

Mañá D amphorae are conventionally viewed as having originated in the Central Mediterranean at Motya, Tharros, Carthage and Utica from the Fourth Century BC, although a western source has also been proposed.<sup>244</sup> The form possesses a cylindrical body, a pronounced point, small handles located on the upper section of the body and a flat mouth, which if used for the transport of liquids will presumably have required sealing with a ceramic stopper of some kind.<sup>245</sup> Mañá D 1a is the most well attested variant of this form attested in the Western Mediterranean which, although scarce in the

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<sup>237</sup> cf Guerrero Ayuso, V M (1986) op. cit. n. 156 p 167-168.

<sup>238</sup> cf Muñoz Vicente, A, De Frutos Reyes, G and Berriatua Hernández, N (1987) op. cit. n. 80 p 488.

<sup>239</sup> cf Guerrero Ayuso, V M (1986) op. cit. n. 156 p 175.

<sup>240</sup> cf *CIL* xv.4730.

<sup>241</sup> Wagner, J (1978) "El Yacimiento submarino de Torre la Sal, Cabanes (Castellon)" in *CPAC* 5 p 323, cites the vessels as having been Mañá B, the form does, however, appear to have been of a Mañá C type, cf also Fernandez Izquierdo, A (1982) op. cit. n. 223 p 115. The wreck is dated to the period c130-110 BC.

<sup>242</sup> cf Parker, A J (1992) op. cit. n. 184 p 151-152.

<sup>243</sup> cf Parker, A J (1992) op. cit. n. 184 p 294.

<sup>244</sup> cf Muñoz Vicente, A, De Frutos Reyes, G and Berriatua Hernández, N (1987) op. cit. n. 80 p 498.

<sup>245</sup> cf De Frutos, G, Chic, G and Berriatua Hernández, N (1988) op. cit. n. 82 p 298.

south of the Peninsula is better attested in the Balearics and the East Coast.<sup>246</sup> Mañá D vessels have been found within the Third Century BC levels at Plaza de Asdrúbal,<sup>247</sup> within Fourth and Second Century BC levels at Avda de Andalucía<sup>248</sup> and in deposits dated to the Fourth-Third Centuries BC at Las Redes.<sup>249</sup> Although many of these forms appear to have been Carthaginian imports, a number, classified as forms E 1 and E 2 seem to have been produced locally during the Fourth-Second Centuries BC in imitation of their central Mediterranean counterparts (fig. 6.4-5).<sup>250</sup> E 1 are well attested in Western Andalucía being classified at Cerro Macareno as Pellicer E 4 and dated to the Fourth Century BC. Examples from Cadíz are dated to the Fourth-Third Centuries BC. E 2 is limited to the vicinity of Cadíz where it is attested from the Fourth-Second Centuries BC, the earliest examples coming from Fourth Century BC contexts at Las Redes and Cabezo de San Pedro. Also perhaps to be related to these vessels are a number of flat mouthed vessels that have been identified at Numantia.<sup>251</sup> As regards the contents of these vessels, the form of the mouth would tend away from their having been used in the transport of liquid commodities and it possible that they were so utilised for transporting grain, as Sanmartí has suggested for the examples from Numantia.<sup>252</sup>

Mañá E amphorae are identified on a number of sites within Eastern Tarraconensis and they appear to be related to Ebusitanian PE 17 amphora. Examples have been identified at Baetulo<sup>253</sup>, Punta de l'Arenal, Tossal de Manises, Alcoy, Elche<sup>254</sup>, El Saler<sup>255</sup>, Bajo de la Campana II (Cabo de Palos, Cartagena)<sup>256</sup>, Torre la Sal

<sup>246</sup> They have been found within the necropoleis of San Antón de Orihuela, El Puig de Alcoy, Tossal de Manises and La Serreta, cf Llobregat, E A (1974) op. cit. n. 150 p 137-138; La Isleta de Campello, Peñón de Ifach and Peyrac sur Mer, cf Sanmartí Grego, E (1983) "Sobre un nuevo tipo de Anfora de Epoca Republicana, de origen presumiblemente Hispanico" in Cerámiques Greques, Hellenistiques a la Peninsula Iberica Empuries 18-20 March 1983 p 139.

<sup>247</sup> cf Muñoz Vicente, A, De Frutos Reyes, G and Berriatua Hernández, N (1987) op. cit. n. 80 p 488.

<sup>248</sup> cf Muñoz Vicente, A, De Frutos Reyes, G and Berriatua Hernández, N (1987) op. cit. n. 80 p 490.

<sup>249</sup> cf De Frutos, G, Chic, G and Berriatua Hernández, N (1988) op. cit. n. 82 p 298.

<sup>250</sup> cf Muñoz Vicente, A, De Frutos Reyes, G and Berriatua Hernández, N (1987) op. cit. n. 80 p 502.

<sup>251</sup> cf Sanmartí Grego, E (1983) op. cit. n. 246 p 135, further examples are attested at Cerro de los Infantes (Pinos Puente, Granada), Cartagena, Illa Pedrosa (L'Estartit, Gerona) and Italica.

<sup>252</sup> cf Sanmartí Grego, E (1983) op. cit. n. 246 p 140.

<sup>253</sup> Puerta, C and Rodríguez, M (1987) "Una industria urbana de producció de vi a Baetulo (Badalona)" in El Vi a l'Antiguitat Economia, Producció i Comerç al Mediterrani Occidental Actes I Colloqui d'Arqueologia Romana (Museo de Badalona) Monografies Badalonines num 9 p 188.

<sup>254</sup> cf Martin, G and Serres, Ma D (1970) op. cit. n. 135 p 102.

(Cabanes)<sup>257</sup>, Riells-La Clota<sup>258</sup>, Denia<sup>259</sup>, Vilassar<sup>260</sup>, Grau Vell de Sagunt<sup>261</sup>, La Serreta, Villajoyosa<sup>262</sup> and Valencia.<sup>263</sup> They have been found with Dr 12 vessels at Vilafranca del Penedes.<sup>264</sup> In terms of chronology they appear in Punic contexts being dated to c250-225 BC at Cabrera II<sup>265</sup>, c175-125 BC at Le Madrague de Montredon<sup>266</sup>, whilst their production on Ibiza is dated from the first half of the Second Century BC to the First Century BC.<sup>267</sup> It is perhaps worth noting that the fabric of a Mañá E vessel from Denia recalls that of a Mañá C amphora from the same locality.<sup>268</sup> Unfortunately the state of the evidence is such that it is impossible to locate production beyond Ibiza and I am unable to cite any evidence as to contents.

Thus, although regional imitations of Punic amphora types do appear within the regions of the East coast, the principal areas of production seem to have lain within the colonies of the Straits of Gibraltar. As we have seen, the south sees the creation of urbanised colonial centres by the Seventh Century BC with the developed economic and social requirements thereof. Although these settlements seem to have been located primarily to exploit the mineral resources, the growth of more urbanised structures will have required greater social differentiation and the establishment of a self-sufficient economic function. The arrival of the Greeks in the region from the Sixth Century BC provided access to wider markets and enabled the appearance of more industrial forms of production with the development of fish salting installations on the Bay of Cadiz. Early production may have been carried in Vuillemont R 1 amphorae before being replaced by Mañá-Pascual A 4 which formed the principal fish sauce amphorae from

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<sup>255</sup> cf Ribera Lacomba, A and Fernandez Izquierdo, A (1985) "Prospecciones Arqueologicas submarinas en la zona del Saler (Valencia)" in VI CIAS Cartagena 1982 (Cartagena) p 90.

<sup>256</sup> cf Mas, J (1985) op. cit. n. 224 p 156.

<sup>257</sup> cf Wagner, J (1978) op. cit. n. 241 p 324.

<sup>258</sup> cf Nolla i Brufau, J M and Nieto Prieto, F J (1985) op. cit. n. 222 p 148.

<sup>259</sup> cf Gisbert Santonja, J M (1985) op. cit. n. 221 p 420-421.

<sup>260</sup> cf Miró i Canals, J (1985) "El Litoral Catalan: Navegacion, materiales arqueologicos submarinos e interpretacion comercial en epoca antigua" in VI CIAS Cartagena 1982 (Cartagena)

<sup>261</sup> cf Gisbert Santonja, J M (1985) op. cit. n. 221 p 423.

<sup>262</sup> cf Llobregat, E A (1974) op. cit. n. 150 p 138.

<sup>263</sup> cf Fernandez Izquierdo, A (1984) op. cit. n. 226 p 35.

<sup>264</sup> cf Miró i Canals, J (1985) op. cit. n. 260 p 458.

<sup>265</sup> cf Parker, A J (1992) op. cit. n. 184 p 80-81.

<sup>266</sup> cf Parker, A J (1992) op. cit. n. 184 p 251.

<sup>267</sup> cf Gisbert Santonja, J M (1985) op. cit. n. 221 p 420.

<sup>268</sup> cf Gisbert Santonja, J M (1985) op. cit. n. 221 p 419-420.

the Fifth-Second Centuries BC. It is at this point that we have seen that the factories of the Bay of Cadíz were sufficiently well established to be exporting to Greece. From the Second Century BC we see the appearance of Mañá C 2 amphorae which dominated the market during the Second-First Centuries BC before being replaced by later Roman forms.

What is perhaps most striking about the early production of fish sauce is the degree of continuity that is evidenced between Phoenician and Roman production. Not only is this evidenced by the continuation of the same production technique, but also in the concentration of fisheries, particularly in the Bay of Cadíz, and in the production of amphorae with the same kilns being engaged in the manufacture of vessels during both the Punic and Roman periods. The continuity of the industry is evidenced also by the survival of the forms themselves, with Mañá C becoming Dr 18, whilst the Ebusitanian PE 41 amphora attested at Na Guardis appears to have been an antecedent of Dr 7-11 and may have been used in the shipment of oysters.<sup>269</sup> It would be wrong, therefore, to point to a fundamental change in the salting industry as a consequence of the shift from Carthaginian to Roman dominion, rather we see a gradual evolution with Punic production forms surviving into the Roman period.

Although Andalucia seems to have formed the centre of such production during the Punic period, there is little evidence to support the existence of a salting industry within the Eastern provinces. What amphora production does occur, principally Mañá B 3 and D forms, seems to have been devoted to the shipment of products other than fish sauce, an hypothesis that is confirmed by the lack of dating evidence for pre-Roman occupation in the fisheries of the region. Rather the distribution of Mañá-Pascual A 4 and Mañá C amphorae points to the inclusion of the region in the commercial sphere of the colonies of the South coast. As with the colonial movement elsewhere we see a conjunction of Greek and Phoenician interests with some trade, at least being in the hands of Massiliot and Ampuritanian merchants, it seems clear, however, that despite some form of Greek colonial presence in much of the region, Phoenician merchants seem able to have infused much of the coast with trade from the South bringing with it a commerce in fish sauces produced on the Bay of Cadíz. Central to this trade seems to

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<sup>269</sup> cf Parker, A J (1992) op. cit. n. 184 p 207-208.

have been the role of Ibiza as a redistributive centre, both in terms of goods from the South, but also to the East. In fact, such was the economic preponderance of Ibiza and the Phoenician colonies of the South, that native communities along the East coast began to produce amphorae copying Phoenician forms from the Fourth Century BC, perhaps in part a consequence of the severance of commercial links with Tyre. It is perhaps no surprise, therefore, that the Phoenician commerce in fish sauce was able not only to survive the vicissitudes of the Third Century BC but to form the basis of later Roman production.

## THE PRODUCTION OF FISH SAUCE

### 1. THE IMPORTANCE OF FISHING AS AN ECONOMIC RESOURCE

In the course of chapter one we discussed fish sauce as having been a composite of fish and salt - two components that played a central role in the establishment of an industrial exploitation of fish sauce. The importance of fish as a natural resource is well evidenced by the frequency of references to such in the literary sources of the Roman period and its close relationship to the preparation of salted fish is evidenced by Manilius' description of fishermen processing their catch along the shore.<sup>1</sup> Any such attempt to discuss the production of *salsamentum* and so forth must, therefore, provide at least a survey of the role of fishing in the Iberian Peninsula.

Fishing seems to have played an important part in man's diet from the Neolithic with finds pertaining to such becoming particularly commonplace from the Bronze Age. As we have seen, the Phoenician colonies of the south are particularly well known for their dependency upon marine resources which has resulted in a tendency to view such activities as having been largely confined to these communities, a premise that would appear to be erroneous considering the finds of evidence relating to fishing activities proving to be ever more widespread. As such a readily available source the coastal communities of the east coast seem to have engaged in the exploitation of marine resources from an early date.<sup>2</sup> Early fishing appears only to have supplied subsistence requirements; however, the arrival of Eastern colonists and the inclusion of the region within the economic sphere of the Graeco-Phoenician world will have enabled the growth of larger scale activities and thus necessitated the development of the fish salting industry.

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<sup>1</sup> cf Manilius *Astronomica* 5.565-81.

<sup>2</sup> cf Gusi i Jener, F and Olaria i Puyoles, C (1991) *El Poblado Neoeolítico de Terrera-Ventura (Tabernas, Almería)* EAE 160 (Madrid).

Archaeological evidence for fishing takes a number of forms: either as the remains of the implements used in the catching of the fish - hooks, net-weights, harpoons and so forth; the remains of structures associated with this process - not only the incidence of fish salteries which we will discuss more fully shortly; but also the appearance of rock-cut basins and corrals used in the entrapment of large quantities of fish, as well as the depiction of such in art - particularly upon coinage of the communities involved; and finally, in the evidence of the fish themselves, namely the incidence of fish bones in the archaeological record which enable us to gain a picture not only of the quantities and type consumed, but also their relative frequency over other forms of diet and the place of such activities within the wider economic calendar.<sup>3</sup>

According to Oppian<sup>4</sup>, four techniques were employed in catching fish: either by rod, line, harpoon or by a variety of different types of net. Unfortunately the organic remains of lines and nets rarely survive in the archaeological record, however, the employment of these techniques can be seen from the incidence of fish hooks and net weights. Fish hooks appear to have been made either of bronze or iron<sup>5</sup>, although the former would appear to have been the most common. They are attested as early as the Bronze Age<sup>6</sup> and are widely found at sites in the South of the Peninsula appearing in collections at Cadiz, Pollentia, San Pedro de Alcántara and within the fisheries located along the Straits of Gibraltar.<sup>7</sup> Such activities clearly were not confined to the south of

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<sup>3</sup> For a summary of the types of evidence for fishing, cf Fernández Ochoa, C (1994) *Una Industria de salazones de Epoca Romana en la Plaza del Marques* Excavaciones Arqueologicas en la Ciudad de Gijon (Gijon) p 133.

<sup>4</sup> Oppian *Haliutica* iii.72-90: *Fourfold modes of luring their prey in the sea have fishermen devised. Some delight in hooks; and of these some fish with a well-twisted line of horse-hair fastened to long reeds, others simply cast a flaxen cord attached to their hands, another rejoices in loaded lines or in lines with many hooks. Others prefer to array nets; and of these there are those called casting-nets, and those called draw-nets - drag-nets and round bag-nets and seines. Others they call cover-nets, and, with the seines, there are those called ground-nets and ball-nets and the crooked drawl: innumerable are the various sorts of such crafty-bosomed nets. Others again have their minds set rather upon weels, which bring joy to their masters while they sleep at ease, and great gain attends little toil. Others with the long pronged Trident wound the fish from the land or from a ship as they will. The due measure and right ordering of these they know certainly who continue these things.* (trans. Loeb ed.).

<sup>5</sup> Oppian *Haliutica* iii.285: *The hook is fashioned of hard bronze or iron, and two separate barbs are attached to the great rope of twisted flax.* (trans. Loeb ed.).

<sup>6</sup> They are found from Castro de Chibanes, Rotura, Setubal. cf Da Viegua Ferreira, O (1968) "Algumas notas acerca da pesca na antiguidade" in *O Archeologo Portugues* 3rd ser. 2 p 119.

<sup>7</sup> cf Gracia Alonso, F (1982) "Ordenacion tipologica del instrumental de pesca en Bronce Ibero-Romano" in *Pyrenae* 17-18 p 322.

the Peninsula, however, and fish hooks have been found at a number of sites to the North-East: Rosas, Nages, Burriac, Mayne, Turó de la Rovira, Enserune, Frejús, Vilaplana and Empúries.<sup>8</sup> They are found in contexts dated as early as the Fourth Century BC at Ullastret and as late as the Third Century AD at the Palaeo-Christian necropolis at Tarragona.<sup>9</sup> Such archaeological evidence is supported by literary references to fishing activities taking place within the region.<sup>10</sup> Suetonius records that Vitellius ate Spanish fish, although we have no indication as to the origins of this. Oysters seem to have attracted particular notice, being identified at Barcino<sup>11</sup> and Tarragona - Livy tells us that fishermen from the latter operated as far south as Carthago Nova.<sup>12</sup> Certainly fishing activities were widespread within the Peninsula as a whole and is widely accredited for such within the literary evidence.

The predominately coastal distribution of the attested finds of fish hooks points to their having been used in marine, as opposed to fluvial fishing, although this distinction may be corrected by further finds. The use of such, however, is better suited to the satisfaction of subsistence requirements than to those of the industrial fish processing attested from the Graeco-Phoenician communities. The development of the fish salting industry will have required the utilisation of more efficient methods of fishing with the principal method employed in the catching of such quantities of fish being the net. The Romans appear to have used a wide variety of different net types, varying according not only to the types of fish desired, but also to local customs and geographical criteria. Both fixed and mobile nets seem to have been used being supported either from boats, or possibly by fishermen from the shore<sup>13</sup>, or by cork floats on the surface and lead, ceramic or even stone weights supporting the net along the sea bottom.

Mobile nets will have been dragged behind fishing boats which, warned of the onset of the fish by watch-towers will have positioned themselves ahead of the shoal

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<sup>8</sup> cf Gracia Alonso, F (1982) op. cit. n. 7 p 321-322.

<sup>9</sup> cf Gracia Alonso, F (1982) op. cit. n. 7 p 326.

<sup>10</sup> cf Livy History 34.9; Avienus Ora Maritima.

<sup>11</sup> Ausonius Epistle 27.

<sup>12</sup> Oribasius ii.58; Livy History 26.45.7.

<sup>13</sup> cf Ponsich, M (1988) Aceite de Oliva y Salazones de Pescado: Factores Geo-Economicos de Betica y Tingitania (Madrid) p 31.

entrapping the fish in a single net which will then have been brought to the shore. In shallower waters it is possible that individual fishermen will have used a similar technique based upon a suitable promontory. More important for the capture of large quantities of fish, however, would seem to have been the fixed net, known today as the 'almadraba'.

The fullest discussion of this process comes in the *Haliutica* of Oppian who describes the tunny as having been drawn into a system of gates and court-yards from which they are dragged ashore.<sup>14</sup> Such processes are still utilised today over much of the Mediterranean, the fish being lured into a maze for nets fixed to the sea-floor by weights and to the surface by floats. Once the trap was full the tunny would then be caught with fish-hooks by the surrounding boats before being brought to the shore and cut up in the manner described by Manilius and the Elder Pliny:

*hi membratim caesi cervice et abdomine commendantur atque clidio,  
recenti dumtaxat, et tum quoque gravi ructu; cetera parte plenis  
pulpamentis sale adservantur: melandrya vocantur, quercus assulis  
similia. vilissima ex his quae caudae proxima, quia pingui carent,  
probatissima quae faucibus; at in alio pisce circa caudam*

<sup>14</sup> Oppian *Haliutica* iii.637-648: ἐνθ' ἦτοι πρῶτον μὲν ἐπ' ὄρθιον ὕψι κολωνὸν ἴδρις ἐπαμβάινει θυννοσκόπος, ὅστε κιούσας παντοαῖς ἀγέλας τεκμαίρεται, αἱ τε καὶ ὄσσαι, παφαύσκει δ' ἐτάροισι. τὰ δ' αὐτικά δίκτυα πάντα ὥστε πόλις προβέβηκεν ἐν οἴδμασιν. ἐν δὲ πύλωροι δίκτυω, ἐν δὲ πύλαι, ρύχατοὶ τ' αὐλῶνες ἔασιν. οἱ δὲ θοῶς σεύονται ἐπὶ στιχᾶς, ὥστε φάλαγγες ἀνδρῶν ἐρχομένων καταφυλααδόν. οἱ μὲν ἔασιν ὀπλοῦτεροι, τοὶ δ' εἰσὶ γεραιότεροί, οἱ δ' ἐνὶ μέσση ὥρη. ἀπειρέσιοι δὲ λίνων ἐντοσθε ρέουσιν, εἰσόκεν ἱμείρωσι καὶ ἀγρομένους ἀνέληται δίκτυον. ἀφπειῆ δὲ καὶ ἐξοχος ἴσταται ἄγη. *There first a skilful Tunny-watcher ascends a steep high hill, who remarks the various shoals, their kind and size, and informs his comrades. Then straightway all the nets are set forth in the waves like a city, and the net has its gate-warders and gates withal and inner courts. And swiftly the Tunnies speed on in line, like ranks of men marching tribe by tribe - these younger, those older, those in the mid-season of their age. Without end they pour within the nets, so long as they desire and as the net can receive the throng of them; and rich and excellent is the spoil. cf also iii.590-595: πολλοὺς δ' ἠϊόνεσσιν ἐφελομένοιο λίνιο ὄψαι ἀμφοτερωθεν ἀρηρότας ἥτε γόμοις, τοὺς μὲν ἐτι φρονέοντας ἐσελθέμεν ἄρκυν ὀλέθρου, τοὺς δ' ἤδη μεμαθτας ὑπεκδῦναι κακότητος, ἐνδοθεν ἱκμαλέησιν ἐνισχομένους βροχίδεσσι. *When the net is hauled ashore, thou shalt see them in multitudes on either side fixed as with nails, some still minded to enter the net of destruction, others already eager to escape from their evil plight, held fast within the dripping nets.* (trans. Loeb ed.).*

*exercitatissima. pelamydes in apolectos particulatimque consectae in genera cybiorum dispertiuntur.*<sup>15</sup>

The use of such elaborate nets will have enabled a dramatic increase in the potential catch - a requirement of the developed fish salting industry from the Phoenician period. The largest attested catch occurred in 1541 at Zahara in which 140,000 tunny were caught, whilst the three 'almadrabas' of the Duke of Medina Sidonia captured 100,000 fish p.a.<sup>16</sup> Such a scale of productivity may go some way to explain the decline in their use from the Sixth Century AD. Some indication of their frequency is gained, however, not only from surviving examples but also from their incidence in the toponymy of the region. They appear to have been located often in relation to fish salteries, as for example in the case of those at Isla de Tabarca a short distance off the coast near the fishery of Santa Pola and although they are attested as having been used in the entrapment of a variety of fish, seem to have been particularly employed in tunny fishing.<sup>17</sup>

The Tunny enters the Mediterranean during mid-June each year en route to the Black Sea to spawn (fig. 7). From the Straits of Gibraltar the shoal splits in two following the currents along the North African coast or turning to the North to follow the Spanish coastline to Southern France. After returning from the eastern Mediterranean towards the end of summer, the tunny would pass back through the straits during late summer/early autumn. Such was the reliability of this supply, taking in not only the Baetican coastline but also as far north as Cabo de la Nao, and thence along the Gulf of Lyon, that a string of almadrabas were located along the coasts of the

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<sup>15</sup> Pliny *NH* 9.18.48: *These fish are cut up into parts, and the neck and belly are counted a delicacy, and also the throat provided it is fresh, and even then it causes severe flatulence; all the rest of the tunny, and the flesh entire, is preserved in salt: these pieces are called melandrya, as resembling splinters of oak-wood. The cheapest of them are the parts next to the tail, because they lack fat, and the parts most favoured are those next to the throat; whereas in other fish the parts around the tail are the most in use. At the pelamys stage they are divided into choice slices and cut up into a sort of little cube.* (trans. Loeb ed.). cf also Manilius *Astronomica* 5.565-81. For the processes involved, cf Ponsich, M (1988) op. cit. n. 13 p 27; Moreno Paramo, A and Abad Casal, L (1970) "Aportaciones al estudio de la pesca en la antigüedad" in *Habis* 1-2 p 213.

<sup>16</sup> cf Ponsich, M (1988) op. cit. n. 13 p 27, 38.

<sup>17</sup> cf Oppian *Halieutica* iii.542-648.

regions concerned in order to provide the flourishing fishing industry with its most plentiful resource, a process that is described by Oppian as follows:

Θύννων δ' αὖ γενεὴ μὲν ἀπ' ευρυπόροιο τέτυκται Ὠκεανού.  
στείχουσι δ' ἐς ἡμετέρης ἄλός ἔργα εἰαρινού μετὰ λύσσαν ὅτ'  
εἰστρησῶσι γάμοιο. τοὺς δ' ἦτοι πρῶτον μὲν Ἰβηροδος ἔνδοθεν  
ἄλμης ἀνέρες ἀγρώσσουσι βίη κομόωντες Ἰβηρες. δεῦτερα δὲ  
Ῥοδανοῖο παρὰ στάμα θηρητῆρες Κελτοὶ Φωκαίης τε  
παλαίφατοι ἐνναετῆρες. τὸ τρίτον ἀγρώσσουσιν ὅσοι Τρινακρίδι  
νήσῳ ἐνναέται πόντου τε παρ' οἴμασι Τυρσηνοῖο. ἐνθεν  
ἀπειρεσίοις ἐνὶ βένθεσιν ἄλλοθεν ἄλλος κίδνανται καὶ πᾶσαν  
ἐπιπλώουσι θάλασσαν. πολλῇ δ' ἔκπαγλός τε παρίσταται  
ἰχθυόλοισιν ἄγρη, ὅτ' εἰαρινὸς θύννων στρατὸς ὀρμήσωνται.  
χῶρον μὲν πάμπρωτον ἐπεφράσαντο θαλάσσης οὔτε λίην  
στεινωπὸν ἐπηρεφέεσσιν ὑπ' ὄχθαις οὔτε λιῆν ἀνέμοισιν  
ἐπίδρομον, ἀλλὰ καὶ αἴθρη καρ σκεπανοῖς κευθμῶσιν ἐνάισιμα  
μέτρα φέροντα. ἐνθ' ἦτοι πρῶτον μὲν ἐπ' ὄρθιον ὕψι κολωνὸν ἴδρις  
ἐπαμβαίνει θυννοσκοπός, ὅστε κιούσας παντοίας ἀγέλας  
τεκμαίρεται, αἱ τε καὶ ὄσσαι, πιφαύσκει δ' ἐτάροισι. τὰ δ' αὐτίκα  
δίκτυα πάντα ὥστε πόλις προβέβηκεν ἐν οἴμασιν. ἐν δὲ πυλωροῖ  
δικτύῳ, ἐν δὲ πύλαι, μύξατοί τ' αὐλῶνες ἔασιν. οἱ δὲ θεῶς  
σεύονται ἐπὶ στίχας, ὥστε φάλαγγες ἀνδρῶν ἐρχομένων  
καταφυλαδόν. οἱ δ' ἐνὶ μέσση ὄρη. ἀπίριοι δὲ λίνων ἐντοσθε  
ρεῶουσιν, εἰσόκεν ἰμείρωσι καὶ ἀγρομένους ἀνέληται δίκτυον.  
ἀφνειὴ δὲ καὶ ἐξοχος ἵσταται ἄγρη.<sup>18</sup>

<sup>18</sup> Oppian *Haliectica* iii.620-648: *The breed of Tunnies comes from the spacious Ocean, and they travel into the regions of our sea when they lust after the frenzy of mating in spring. First the Iberians who plume themselves upon their might capture them within Iberian brine; next by the mouth of the Rhone the Celts and the ancient inhabitants of Phocaea hunt them; and thirdly those who are the dwellers in the Trinacrian isle and by the waves of the Tyrrhenian sea. Thence in the unmeasured deeps they scatter this way or that and travel all over the sea. Abundant and wondrous is the spoil for fishermen when the host of Tunnies set forth in Spring. First of all the fishers mark a place in the sea which is neither to straitened under beetling banks nor too open to the winds, but has due measure of open sky and shady coverts. There first a skilful Tunny-watcher ascends a steep high hill, who remarks*

As well as the employment of nets in the entrapment of the tunny, the regularity of their migratory patterns also enabled the use of more permanent traps. A series of submarine remains have been located in the Bay of Cadiz, along the coast between the R. Barbate and the estuary of the Cachón. These take one of two forms; either cut directly out of the rock or constructed from rough stone walls. Those cut out of the rock are generally circular of about 200-300m in diameter and are linked to the sea by a rock-cut channel.<sup>19</sup> The second category are much more poorly preserved but appear to have been positioned further out from the shore. These seem to have acted as traps with the fish being brought in with the high tide and being left behind after the withdrawal of the water. Such methods of entrapment were in use along the Andalusian coast as late as the Nineteenth Century in locations associated with fish factories, as for example is the case at Sanlúcar, whilst those at Barbate may also be related to such a site nearby.<sup>20</sup> One also notes that similar techniques are employed by fishermen today on the Mar Menor near Cartagena.<sup>21</sup> Pliny refers to such as having been used as *cetariae* for the storage of live fish<sup>22</sup> whilst Columella refers to the possible existence of fish pools along the Baetican coast.<sup>23</sup> Such are particularly associated with the salting industry in Alicante where they have acquired the generic title of *Baños de la Reina*.

The most widely known of these is located at Punta de l'Arenal (Xabía) and was studied by Gabriella Martin in 1963.<sup>24</sup> The existence of Roman settlement has long

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*the various shoals, their kind and size, and informs his comrades. Then straightway all the nets are set forth in the waves like a city, and the net has its gate-warders and gates withal and inner courts. And swiftly the Tunnies speed on in line, like ranks of men marching tribe by tribe - these younger, those older, those in the mid season of their age. Without end they pour within the nets, so long as they desire and as the net can receive the throng of them; and rich and excellent is the spoil.* (trans. Loeb ed.).

<sup>19</sup> cf Moreno Paramo, A and Abad Casal, L (1970) op. cit. n. 15 p 214-219.

<sup>20</sup> cf Moreno Paramo, A and Abad Casal, L (1970) op. cit. n. 15 p 219. Ponsich, M (1988) op. cit. n. 13 p 202-203, records the existence of two fisheries at Baesippo and on the mouth of the R. Barbate. The existence of salting vats are recorded in a number of sources but no trace survives to the present day.

<sup>21</sup> cf Lillo, A & M "On Polybius X.10.12f.: the capture of New Carthage" in *Historia* 37, 1988 pp.477-480.

<sup>22</sup> Pliny *NH* 9.19.1.

<sup>23</sup> Columella *Re Rustica* 8.7.

<sup>24</sup> cf Martin, G (1970) "Las pesquerias Romanas de la Costa de Alicante" in *PLAV* 10 p144-145; Martin, G and Serres, Ma D (1970) *La Factoria Pesquera de la Punta de l'Arenal y otros restos romanos de Javea (Alicante)* in *TV del SIP* 38 (Valencia) p 14. cf also Figueras Pachero, F (1945) "Panorama arqueologico de Javea y sus cercanias" in *AEA* 18 p 9; Reynolds, P (1993) *Settlement and*

been known on the site thanks to finds of ceramics and architectural remains and the *Baños* are conventionally associated with this period. They consist of a large rock cut basin measuring 28m by 7m and are 4m in depth (fig. 8, pl. 3). It is subdivided into three compartments through which water can circulate by means of a narrow channel cut through the two transversal walls. At the eastern end of the tank are two rock-cut canals linking it with the sea. The largest is 1.60m wide and runs perpendicular to the sea for 13m, the smaller is 0.50m wide and runs transversally to the sea for 12m (fig. 9). This arrangement allows the entrance of the sea water through the larger of the two canals and its departure through the second. Thus by closing the exit it is possible to fill the basin and the slots for a sluice gate are clearly visible. It is unclear, however, whether or not this structure is associated with the second phase of activity on the site (Second-Third Centuries AD) which sees the principal phase of operation of the fish factory.

Such structures are found at several locations along the coast of Alicante. One such has been found adjoining the Ibero-Roman settlement of Isleta de Campello a short distance to the north of Alicante. A large tank measuring 12m by 8m has been found which is further subdivided into four compartments of which two survive (fig. 9).<sup>25</sup> Two further vats have been found a short distance down the coast.<sup>26</sup> The tank is connected to the sea by two rock-cut channels on each of the shorter ends. There is little indication as to the date, although it would appear to be in accord with that for the rest of the site<sup>27</sup> and to date to the Second-Third Centuries AD. Lying between the modern town of Calpe and the Graeco-Iberian settlement of the Peñón de Ifach (fig. 10)<sup>28</sup> are a series of rock-cut basins connected to the sea by two channels which were excavated in the Eighteenth Century by the antiquarian, Antonio Jose Cavanilles (fig.

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Pottery in the Vinalopó valley (Alicante, Spain) BAR Int. Ser. 588 (Oxford) p 84; Sanchez Fernandez, Ma J, Blasco, E and Guardiola, A (1989) "Descubrimiento de una factoria bajoimperial de salazon de pescado en Santa Pola (Alicante)" in Saguntum 22 p 434.

<sup>25</sup> cf Figueras Pachero, F (1934) Excavaciones en la Isla del Campello (Alicante 1931-1933) JSTA 34 (Madrid) p 34; Martin, G (1970) op. cit. n. 24 p 148.

<sup>26</sup> cf Reynolds, P (1993) op. cit. n. 24 p 45.

<sup>27</sup> cf Figueras Pachero, F (1934) op. cit. n. 25 p 35.

<sup>28</sup> On the settlement of the Peñón, cf Aranegui Gasco, C (1973) "Materiales Arqueologicos del Penon de Ifac (Calpe)" in PLAV 9 49-69.

11, pl. 6-7).<sup>29</sup> Little is known of the structures although the adjoining villa is dated from the Second to the Fourth Centuries AD on the basis of finds of Sigillata Clara A and D (fig. 12, pl. 8).<sup>30</sup> Sanchez Fernandez has noted the presence of worked stone basins at Punta de Pilas, between Cabo Cervera and Torrevieja which may have been fish tanks.<sup>31</sup> Badly preserved basins have been identified at Santa Pola on the mouth of the R. Vinalopó<sup>32</sup> and on the Isla de Tabarca along with pottery dated to the Third Century AD (pl. 9). An example is also attested at La Albufera which may have been related to the nearby fish factory of La Almadrava.<sup>33</sup> Gabriella Martin has cited the existence of such at Tossal de Manises.<sup>34</sup>

Although there is no unequivocal evidence as to the function of these structures, their coincidence with fish salting vats at Punta de l'Arenal, Isleta de Campello, Santa Pola and La Albufera would suggest a role relating to the salting of fish. Their actual function has, however, been the object of some debate: Bendicho interpreted those of Campello as having been salt-flats, although the possession of internal divisions and the limited surface area would count against this<sup>35</sup> - although the alternative proposed by Figueras Pachero, that they were used as nurseries for the breeding of fish would appear equally unreliable. Adolf Schulten chose to follow the traditional title of those at Calpe and to identify them as having been baths: *Unten im meere sieht man Bassins zum Baden, die in den felsen geschnitten sind (>Bano de la reina<)*.<sup>36</sup>

In the First Century AD Columella described the construction of a salt pool for fish:

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<sup>29</sup> cf Cavanilles, A J (1795) Observaciones sobre la Historia Natural, Agricultura, Poblacion y Frutos del Reyno de Valencia (Zaragoza).

<sup>30</sup> cf Gorges, J G (1979) Les Villas Hispano-Romaines (Paris) p 181.

<sup>31</sup> cf Sanchez Fernandez, Ma J, Blasco, E and Guardiola, A (1989) op. cit. n. 24 p 432.

<sup>32</sup> cf Ponsich, M (1988) op. cit. n. 13 p 174; Sanchez Fernandez, Ma J, Blasco, E and Guardiola, A (1989) op. cit. n. 24 p 432.

<sup>33</sup> cf Reynolds, P (1993) op. cit. n. 24 p 47, a similar structure is also noted at Formentera although the author gives no further details to this citation.

<sup>34</sup> cf Martin, G (1970) op. cit. n. 24 p 147; cf also Ponsich, M (1988) op. cit. n. 13 p 173.

<sup>35</sup> cf Figueras Pachero, F (1934) op. cit. n. 25 p 35.

<sup>36</sup> cf Schulten, A (1927) "Forschungen in Spanien" in AA p 227: *below the sea one can see basins for bathing, which were cut into the rock*. Those located within the Herodian palace at Caesarea Maritima have also been identified as having been baths; on Caesarea, cf Holum, K G, Hohlfelder, R L, Bull, R J and Raban, A (1988) King Herod's Dream: Caesarea on the Sea (New York).

*Stagnum censemus eximie optimum, quod sic positum est, ut insequens maris unda priorem submoveat, nec intra conseptum sinat remanere veterem....Id autem stagnum vel exciditur in petra, cuius rarissima est occasio, vel in litore construitur opere signino...itineraque, si loci natura permittit, omni lateri piscinae dari convenit. Facilius enim vetus submovetur unda, cum quacunque parte fluctus urget, per adversam patet exitus. Hos autem meatus fieri censemus per imam consepti partem, si loci situs ita competit, ut in solo piscinae posita libella septem pedibus sublimius esse maris aequor ostendat: nam piscibus stagni haec in altitudinem gurgitis mensura abunde est. Nec dubium, quin quanto magis imo mari venit unda, tanto sit frigidior, quod est aptissimum nantibus. Sin autem locus, ubi vivarium constituere censemus, pari libra cum aequore maris est, in pedes novem defodiatur piscina, et infra duos a summa parte cuniculis rivi perducantur; curandumque est, ut largissime veniant, quoniam modus ille aquae iacentis infra libram maris non aliter exprimitur, quam si maior recentis freti vis incesserit.*<sup>37</sup>

The description fits with what we have identified from the sites within Alicante. The arrangement of channels providing and emptying these basins with water would have enabled their use in the entrapment of large quantities of fish - as we have seen, that of Punta del Arenal was equipped with sluice gates in order to enable the storage

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<sup>37</sup> Columella *Re Rustica* 8.17.1-4: *We consider incomparably the best pond is one which is so situated that the incoming tide of the sea expels the water of the previous tide and does not allow any stale water to remain within the enclosure...The pond is either hewn in the rock, which only rarely occurs, or built of plaster on the shore....If the nature of the ground permits, channels should be provided for the water on every side of the fish-pond; for the old water is more easily carried away if there is an outlet on the side opposite to that from which the wave forces its way in. We are of opinion that these passages, if the lie of the land is suitable, should be made along the lower part of the enclosure, so that a plummet placed on the bottom of the pond may show that the level of the sea is seven feet higher; for this measurement in the depth of the water is fully enough for the fish in the pond, and there is no doubt that, the greater the depth of the sea from which the water comes, the colder it is, and this suits the swimming fishes very well. But if the place where we think of constructing the fish-pond is on a level with the surface of the sea, the pond should be excavated to the depth of nine feet, and two feet below the top streams of water should be conducted along small channels, and care must be taken that the flow is very abundant, since the quantity of water which lies below the level of the sea is only forced out by the greater violence of the fresh sea rushing in.* (trans. Loeb ed.).

of fish. Such remains are not unparalleled elsewhere in the Roman world outside the Iberian Peninsula: we have already referred to their presence at Caesarea Maritima, they are also located within the harbour area of Sarepta<sup>38</sup>, at Lapithos, Cyprus<sup>39</sup>, within the Phoenician colony at Motya<sup>40</sup> and at L'Île Sainte-Marguerite.<sup>41</sup> It is also possible that the Tagliata and Tagliata Picola at Cosa served a similar function.<sup>42</sup>

The use of such *piscinae* and 'almadrabas' is best suited to the fixed fishing cycles of migratory fish such as the Tunny and it is significant that the distribution of such matches that of the tunny routes across the Mediterranean.<sup>43</sup> The quantities of fish obtainable by these methods would enable the establishment of an industry devoted to the preservation of fish and the coincidence of almadrabas and fisheries is hardly accidental.<sup>44</sup>

Although the quantities of tunny obtained by this means must have been plentiful, the seasonal character of their deployment will have meant that for much of the year the fisheries must have utilised other sources of fish - something which we have already touched upon in the earlier discussion of the different types of fish sauce. Both Strabo<sup>45</sup> and Martial<sup>46</sup> refer to the production of the most popular *garum* from the Scomber or Mackerel, a use borne out by the frequent references to such in the *tituli picti* of *garum* amphorae. Mackerel bones have been found within Camulodunum 186a amphorae from the Port-Vendres II wreck<sup>47</sup> and are attested along with Sardines from

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<sup>38</sup> cf Pritchard, J B (1978) Recovering Sarepta, a Phoenician city: Excavations at Sarafand, Lebanon, 1969-1974, by the University Museum of the University of Pennsylvania (Princeton) p 62-65, who cites examples from Chersonios and Mochlos in Crete.

<sup>39</sup> cf Nicolaou, K and Flinder, A (1976) "Ancient Fish tanks at Lapithos, Cyprus" in *IJNA* 5.2 p 133-141.

<sup>40</sup> I have preferred the traditional identification of the *cothon* to the currently fashionable view of its having been a dry dock.

<sup>41</sup> cf Formigé, J (1947) "La Station Antique de Lero a l'Île Sainte-Marguerite (Alpes-Maritimes)" in *Gallia* 5 p 146-155.

<sup>42</sup> cf McCann, A M (1987) The Roman Port and Fishery at Cosa (Princeton) p 142-143.

<sup>43</sup> Tunny bones have been found within Dr 12-13 amphorae from the Titan wreck, cf Sealey, P R (1985) Amphorae from the 1970 excavations at Colchester Sheepen BAR Brit. Ser. 142 (Oxford) p 83.

<sup>44</sup> cf Gallant, T W (1985) A Fisherman's Tale *Miscellanea Graeca* 7 (Ghent) for a more limited interpretation of the role of such. Although feasible in the subsistence economy of the early Aegean I do not believe his arguments are tenable in relation to such an established 'industrial' exploitation of fish resources as can be seen, for example, in Baetica.

<sup>45</sup> Strabo 2.4.6.

<sup>46</sup> Martial 13.102.

<sup>47</sup> cf Colls, D et alii (1977) L'épave Port-Vendres II et le commerce de la Bétique à l'époque de Claude *Archaeonautica* 1 (Paris) p 40-42.

Dr 7-11 amphorae at Cerro del Mar.<sup>48</sup> Oppian refers to both the mackerel and the tunny as having been caught by *almadrabas*<sup>49</sup>, whilst Pliny speaks of the mackerel as filling the fish tanks of Spain.<sup>50</sup> Mackerel bones have also been found within the fish factory at Plaza del Marques (Gijon).<sup>51</sup> Carthago Nova is particularly noted in this regard as having produced sauces from the Scomber.<sup>52</sup>

The Sardine and the Anchovy seem also to have been widely used in the manufacture of fish sauce being found in vessels containing *Hallec* in Herodian levels at Masada.<sup>53</sup> Similarly a vessel from Petra was found to contain fish bones pertaining to the *Clupeidae*.<sup>54</sup> Similar bones have been found within Almagro 50 amphorae from the Randello wreck.<sup>55</sup> That a wide variety of fish types were used can be seen from the deposits of fish bones excavated from the factories at Combrit and Plomarc'h in Gaul which included sardines, sprats and eels.<sup>56</sup> Several literary sources refer to the capture of whales<sup>57</sup> and bones pertaining to such have been found at Belo<sup>58</sup>, Torre del Reloj (Gijon) and Bares (Lugo).<sup>59</sup> Pliny records that the mullet was caught using nets in shallow water and then killed with forks and he quotes Apicius as to the desirability of

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<sup>48</sup> cf von den Driesch, A (1980) "Osteoarchäologische Auswertung von Garum-resten des Cerro del Mar" in *MM* 21 p 151-154; cf also Arteaga, O (1977) "Vorbericht über die Grabungskampagne 1976 auf dem Cerro del Mar" in *MM* 18 p 101-115.

<sup>49</sup> Oppian *Haliutica* iii.577-606.

<sup>50</sup> Pliny *NH* 9.19.49: *Hispaniae Cetariis hi replent thynnus non commeantibus*.

<sup>51</sup> cf Fernández Ochoa, C (1994) op. cit. n. 3 p 135, 189-197.

<sup>52</sup> cf Strabo 3.4.6.

<sup>53</sup> cf Cotton, H, Lernau, O and Goren, Y (1996) "Fish sauces from Herodian Masada" in *JRA* 9 p 226. The vessel containing this residue was identified as having been either a Dr 38 or Dr 12 amphora originating from Southern Spain and appear to date to the period 27/26 - 19 BC. The export of Baetican (?) sauces to the Near East is attested by the appearance of otherwise unspecified S. Spanish garum amphora within the harbour at Caesarea Maritima, cf Blakely, J A (1988) "Ceramics and Commerce: Amphorae from Caesarea Maritima" in *BASOR* 271 p 31-50.

<sup>54</sup> cf Cotton, H, Lernau, O and Goren, Y (1996) op. cit. n. 53 p 232.

<sup>55</sup> cf Wheeler, A and Locker, A (1985) "The estimation of size in Sardines (*Sardina Pilchardus*) from amphorae in a wreck at Randello, Sicily" in *JAS* 12 p 97-100.

<sup>56</sup> cf Sanquer, R and Galliou, P (1972) "Garum, sel et salaisons en Amorique Gallo-Romaine" in *Gallia* 30 p 207; Sanquer, R (1977) "Informations archéologiques. Bretagne (Finistère): Douarnenez" in *Gallia* 35 p 355-360.

<sup>57</sup> Strabo 2.3.4; Pliny *NH* 9.5; Oppian *Haliutica* 5.115.

<sup>58</sup> cf Ponsich, M (1988) op. cit. n. 13 p 39.

<sup>59</sup> cf Fernández Ochoa, C (1994) op. cit. n. 3 p 135.

fish sauces made with the same fish.<sup>60</sup> Columella on the other hand states that dory was most favoured at Gades.<sup>61</sup>

The range of commodities may also have included the salting of oysters at Narbo<sup>62</sup>, for which both Tarraco and Barcino are noted.<sup>63</sup> The salting of other meats is also possible with a Mañá B amphora from Torre de la Sal containing ovicaprid bones.<sup>64</sup> The bones of sheep and cattle have also been found within basins at Kerobestin and Telgruc in Gaul.<sup>65</sup>

Although the processing of the tunny will have provided an important resource for the salteries, it would have been economically unfeasible for such installations to have remained fallow for the remainder of the year. It would appear, therefore, that at those times during which the tunny was unavailable, use was made of other marine resources. Such an hypothesis should not be taken too far, however, as a number of types of sauces specifically call for the use of other varieties of fish, some of which such as the Mackerel may have been more prized than the tunny. The question of the use of migrant fishermen may also be considered.<sup>66</sup> Even so, the quantities of fish required will have encouraged the use of more specialised techniques of fishing such as the 'almadraba' and these clearly played an important role in the development of fish salting installations.

## 2. THE ARCHAEOLOGICAL EVIDENCE FOR FISH SALTERIES WITHIN EASTERN TARRACONENSIS

Evidence of fish salting activities, usually in the form of the *cetariae*, or vats used in the salting of fish, have been found along much of the coastline of both Spain

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<sup>60</sup> Pliny *NH* 9.9.29-32, 9.30.66.

<sup>61</sup> Columella *Re Rustica* 8.16.9: *ut Atlantico faber, qui et generosissimis piscibus adnumeratur, in nostro Gadium municipio eumque prisca consuetudine zeum appellamus.* "and the dory in the Atlantic which in our municipality of Gades is numbered amongst the noblest of fishes and which by an ancient custom we call zeus." (trans. Loeb ed.); cf also Pliny *NH* 9. 68.

<sup>62</sup> cf Solier, Y (1964) "Dépôt d'huîtres au Boulevard de 1848" in *Bulletin de la Commission archéologique de Narbonne* 38 p 73-76. I regret that I have been unable to consult this source directly, it is cited by Curtis, R I (1991) *Garum and Salsamenta: Production and Commerce in Materia Medica* (Leiden) p 72.

<sup>63</sup> cf Ausonius *Epistle* 27 and Oribasius ii.58.

<sup>64</sup> cf Wagner, J (1978) "El yacimiento submarino de Torre la Sal, Cabanes (Castellon)" in *CPAC* 5 p 323.

<sup>65</sup> cf Curtis, R I (1991) op. cit. n. 62 p 75 n. 140.

<sup>66</sup> More shall be said of such shortly.

and Portugal<sup>67</sup> with a preponderance in the regions abutting the Straits of Gibraltar (fig. 13). Although the industry is well attested in the literary sources, no source provides us with a description of the actual installation within which this processing would take place. As a consequence we are forced to rely upon a variable pattern of archaeological evidence. Often the only evidence consists of the *cetariae* themselves, but at others we possess centres for which the epithet 'industry' is not misplaced, for example, at Lixus, Belo, Cotta or Troia. Such are the variations, therefore, that we cannot speak of what makes a typical fish factory. The form which these installations took seems to have varied according not only to location and scale of catch, but also upon more regional and cultural grounds.<sup>68</sup> Even so, it is possible to speak of four essential criteria in the establishment of a saltery: access to plentiful supplies of fish; to salt and fresh water, and finally, to a harbour or urban centre, both to provide a base for the fishing fleet and an opportunity for the export of the produce concerned.

As we have seen, the tunny appear to have been the most important source of fish for the factories and it is no surprise that the location of such installations lie along their migratory routes. Further to this it is worth reiterating the coincidence between the locations of fish factories and of 'almadrabas' and *piscinae* used in the capture of these fish. In months during which the tunny were not available use would have been made of other types of fish, most particularly the mackerel, whilst the processing of purple dye could also take place.

Secondly, a ready supply of fresh water would be required for the cleaning of the fish necessitating access either to a river mouth, or the provision of wells in the immediate vicinity. The latter are not widely attested within the fisheries of the East coast although they do seem to have been employed within the factory at Rosas where a well has been identified within building G-IV.<sup>69</sup> More regularly the fisheries seem to

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<sup>67</sup> For the fullest catalogue of fish salteries, cf Ponsich, M (1988) op. cit. n. 13. Ponsich's work is, however, being increasingly superseded, particularly with the identification of fish salteries in Asturias, cf Fernández Ochoa, C and Martínez Maganto, J (1994) "Las industrias de salazón en el Norte de la Península Ibérica en Época Romana. Nuevas aportaciones" in *AEA* 67 p 115-134. On the fish factories of Portugal, cf Edmondson, J C (1987) *Two Industries in Roman Lusitania* BAR Int. Ser. 362 (London).

<sup>68</sup> cf Martin, G and Serres, Ma D (1970) op. cit. n. 24 p 83-6.

<sup>69</sup> cf Nolla i Brufau, J Ma (1984) "Excavaciones recientes en la ciudadela de Rosas: el edificio bajo-imperial" in Keay, S J, Jones, R F J and Blagg, T *Papers in Iberian Archaeology* BAR Int. Ser. 193 p 438.

have been located on or near a river mouth, although the collection of rain water may also have been utilised.<sup>70</sup>

This water will also have been used in the production of the brine in which the fish would be immersed. Such will have required large quantities of salt with *salinae* often located nearby, although the use of salt mines is also possible, perhaps most notably those at Egelasta supplying the salting industry of Carthago Nova. The norm would, however, appear to have been the utilisation of marine salt to meet the requirements of the preservation process.<sup>71</sup>

Although the provision of raw materials will have played a primary role in the establishment of fish factories, to function as an economic unit they will have required access to points of demand and/or redistribution. The location of factories within urban contexts, as is best seen at Belo, but which is also present elsewhere, for example, at Empúries, will go some way to negate this requirement. The bulk of Tarraconensian production, however, appears to have been placed in a more rural context and although the satisfaction of the demands of local *villae* will have played an important part, the location of factories at or near facilities for loading and unloading vessels seems to have been relatively common, with their location upon river mouths being ideally suited to the provision of harbour facilities.

Although it is not possible to speak of such as a criteria for the characterisation of fish factories, the above requirements carry with them a necessity for the installations to be located in immediate reach of the sea.<sup>72</sup> Ponsich has noted such in regard to the provision of fish to the factory.<sup>73</sup>

The importance of these criteria upon the location of a fishery is perhaps best seen in the complex of fish salteries located at Xabia. Two fisheries, Punta de l'Arenal

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<sup>70</sup> A large rectangular basin lined with *opus signinum* within the fish factory at Santa Pola has been interpreted as having served as a catchment area for rain-water, cf Sanchez Fernandez, Ma J, Blasco, E and Guardiola, A (1989) op. cit. n. 24 p 430.

<sup>71</sup> Although the utilisation of salt seems to have been by far the commonest method used in the preservation of meat, it did not exercise a monopoly. One must note the possible production of dried fish within the fish factory at Trafalgar, where, as well as two basins lined with *opus signinum*, has been found a small, well-aerated structure which may have served to support drying racks for the fish. cf Amores, F (1978) "Una nueva factoria romana de salazones en Trafalgar (Cadiz)" in *Habis* 9 p 444.

<sup>72</sup> Such seems even to have been to the potential detriment of the factory with the installation at Trafalgar being abandoned in the second half of the Second Century AD as a possible consequence of erosion, cf Amores, F (1978) op. cit. n. 71 p 452.

<sup>73</sup> cf Ponsich, M (1988) op. cit. n. 13 p 78.

and Punta del Castell lie upon rocky promontories at either end of the beach of Arenal (fig. 14).<sup>74</sup> Until recently an 'almadraba' was situated a short distance to the south at Cala Blanca with tunny fishing still remaining important during September and October.<sup>75</sup> As to the acquisition of fresh water the canal of La Fontana links the fisheries with the R. Gorgos. Abutting this and dating to the medieval period is a wall built out of residual Roman remains and upon which iron rings have been found for tying ships.<sup>76</sup> Finds of imported amphorae may point to this dock having been in use during the Roman period.<sup>77</sup> The complex may have been related to the *salinae* located a short distance to the south of Punta del Castell. An artificial channel has been found linking an area of no longer extant salt flats at <Las Salinas> with the sea covering a distance of c100m (pl. 10-12). Grooves for sluice gates are clearly visible on the seaward approaches of the channel and it would seem to have been used in the draining of the associated salt-flats (pl. 13).<sup>78</sup>

Similarly the fishery at Santa Pola lies in an area amply supplied with *salinae* (pl. 14) - the largest being those of Braç del Port covering an area of 700 ha which date back to the Nineteenth Century.<sup>79</sup> *Salinae* are also located within the immediate vicinity of the fishery at Calpe.<sup>80</sup> A small stream lies to the west of the Cuidadela at Rosas and preserves the name *Salines* although no such survive to the present.<sup>81</sup> Perhaps most significant considering the scale of production attested in the literary sources is the evidence for salting in the vicinity of Carthago Nova. Recent years have seen the identification of a number of sites within the vicinity of the city: at Las Mateas (Los Nietos), Castillico, Galifa, Escombreras, El Mojón (Puerto de Mazarron), El Castellar, Aguilas, La Azohía and Santa Lucia (fig. 15).<sup>82</sup> Little evidence exists for a comparable

<sup>74</sup> cf Martin, G and Serres, Ma D (1970) op. cit. n. 24 p 8.

<sup>75</sup> cf Sheffield, B (1994) "Sea fishing in Santa Pola" in Costa Blanca News Friday, 9 September 1994 p 31.

<sup>76</sup> cf Martin, G and Serres, Ma D (1970) op. cit. n. 24 p 8.

<sup>77</sup> cf Bolufer i Marques, J (1987) "Una marca d'Amfora Maurítana de la Punta de l'Arenal (Xabia, Alacant)" in El Vi a l'Antiguitat Economia, Produccio i Comerç al Mediterrani Occidental Actes I Colloqui d'Arqueologia Romana (Museo de Badalona) Monografies Badalonines num. 9 p 443-445.

<sup>78</sup> cf Martin, G and Serres, Ma D (1970) op. cit. n. 24 p 92. For more detail cf chapter 5.

<sup>79</sup> cf Sanchez Fernandez, Ma J, Blasco, E and Guardiola, A (1989) op. cit. n. 24 p 429-430.

<sup>80</sup> cf Schulten, A (1927) op. cit. n. 36 p 227.

<sup>81</sup> cf Nolla i Brufau, J Ma (1984) op. cit. n. 69 p 438.

<sup>82</sup> cf García del Toro, J R (1978) "Garum Sociorum: la industria de salazones de pescado en la Edad Antigua en Cartagena" in Anales de la Universidad de Murcia 36.1-2 p 27-57, Ramallo Asensio, S F

utilization of salt although Avienus does refer to such<sup>83</sup> and modern *salinae* are known at Pinel, La Mata, Torrevieja and Cotorillo.<sup>84</sup> An important salt mine was also to be located a short distance to the north at Egelasta, the salt of which was praised by Pliny: *in Hispania quoque Egelasta caeditur glaebis paene transgicetibus cui iama pridem palma a plerisque medicis iter omnia salis genera perhibetur.*<sup>85</sup> In fact such was the importance of production at Carthago Nova and its close connections with the fish salting industry have led to the supposition that the latter was merely a dependent of the salting industry in the region.<sup>86</sup>

To judge by the description of Manilius<sup>87</sup> the tunny will have been caught in 'almadrabas' lying off the shore where they are killed and the carcasses deposited along the beach where they are cut up into their constituent parts, each going to serve a different end. Ponsich has suggested that the locating of fisheries within the immediate vicinity of the shore was due to the impossibility of moving such quantities of fish any further overland.<sup>88</sup> The veracity of Manilius' account is impossible to ascertain on the basis of the archaeological evidence, and it has been suggested that the use of temporary basins as part of an *ad hoc* processing of fish may have been widespread. Certainly some interrelationship between fishermen and fish salters is possible with a Second Century AD papyrus from Oxyrhynchus recording the lease of fishing rights for six years in return for 240 drachmae, 30 jars of fish sauce, 2 jars of shad, 2 jars of spanish mackerel, one jar of mullet and one jar of catfish.<sup>89</sup> Similarly a papyrus from Panopolis records a fisherman providing both fish, salt fish and fish sauce for the visit of the emperor Caracalla in AD 215-216.<sup>90</sup> Although unattested elsewhere, the appearance of the guild of *Piscatores et Propolae* at Carthago Nova may indicate a similar involvement in Hispania Tarraconensis.<sup>91</sup>

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(1989) La Ciudad Romana de Carthago Nova: la Documentacion Arqueologica (Universidad de Murcia) p 136-144.

<sup>83</sup> Avienus Orae Maritimae 460.

<sup>84</sup> It is also possible that the Almarjal lagoon was similarly utilised.

<sup>85</sup> Pliny NH 31.39.80; cf also Cato (apud Gellius) 2.22, Sidonius Epistle 9.12.

<sup>86</sup> cf Etienne, R (1970) "A propos du 'Garum Sociorum'" in Latomus 29 p 297-313.

<sup>87</sup> cf Manilius Astronomica 5.565-81.

<sup>88</sup> cf Ponsich, M (1988) op. cit. n. 13 p 78.

<sup>89</sup> cf Parassoglou, G M (1987) "A lease of Fishing Rights" in Aegyptus 67 p 89-93.

<sup>90</sup> P. Got. 3, cited by Curtis, R I (1991) op. cit. n. 62 p 140.

<sup>91</sup> cf Beltran, A "Las lápidas latinas religiosas y conmemorativas de Cartagena" in AEA 80, 1950 p.259: C. LAETILIO. M. F. A / II.VIR. QVINQ. / LARES. AUGUSTALES. ET. PROPOLAE. DE.

Although Manilius' account of fishermen dissecting their catch along the shore may well be true, the archaeological evidence points to their having been included within the confines of the fish factory itself with areas being set aside for this purpose at a number of fish salting sites. The cutting up of the catch would facilitate the salting process and this seems likely to have taken place within the vicinity of the vats in which the fish will have been salted. The best preserved fisheries lie along the Straits of Gibraltar where such a layout is attested at a number of installations. Ponsich<sup>92</sup> has cited the existence of six factories within the confines of Belo.<sup>93</sup> The largest of the installations is factory n. 2 which consists of nine tanks arranged around a patio and has a volume of c40-50 m<sup>3</sup>. This is perhaps part of a single complex with the six vats found within factory n.1.<sup>94</sup> The fish would be brought into the installation to be cut up in the central patio prior to being placed in the surrounding vats.<sup>95</sup> The floor of the room is sloping and is provided with a small drain along one wall. Similar facilities are attested in many of the fish factories of the southern Peninsula and North Africa and are too common to be cited here, suffice it to mention a number of the more prominent examples. The factory at Cotta lies about 100m from the shore and consists of a large rectangular building measuring 56 by 40m.<sup>96</sup> The fishery itself forms a block of 25 by 19m consisting of a room containing the salting basins arranged around an *impluvium* and cistern which appear to have been used in the cleaning of the fish and of the installation itself, as well as a store room and a second containing a hearth which may have been used to heat the fish sauce mixtures in order to hasten the production process. Although some factories contain floors preserving a darkened colour - the consequence of the dissection of the fish, rooms used in this process seem to have been lined with *opus signinum*. To the north of the two salting vats excavated at Trafalgar is

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PECUM. SVA. / F.C.I.Q.P. / C(aio) LAETILIO M(arci) F(ilio) A(polo) / II VIR(o) QVIQ(uenalis) LARES AUGUSTALES ET MERCURIUM / PISCATORES ET PROPOLAS DE PECUN(ia) SUA F(aciendum) / C(uraverunt) I(dem) Q(ue) P(osuerunt). The inscription was discovered at the Puertas de Murcia (Cartagena) in 1875 and is dated to the period AD 10-14.

<sup>92</sup> cf Ponsich, M (1988) op. cit. n. 13 p 196-199.

<sup>93</sup> The precise definition of a factory is difficult and has resulted in a number of different figures being given for the scale of the operation at Belo, cf Curtis, R I (1991) op. cit. n. 62 p 51 n. 38, cf also Etienne, R, Makaroun, Y and Mayet, F (1994) Un Grand Complexe Industrielle a Troia (Portugal) (Paris) p 70.

<sup>94</sup> cf Curtis, R I (1991) op. cit. n. 62 p 51.

<sup>95</sup> cf Ponsich, M (1976) "A propos d'une usine antiques de salaison a Belo" in MCV 12 p 69-79.

<sup>96</sup> cf Ponsich, M (1988) op. cit. n. 13 p 150-159.

a range of rooms provided with a floor of *opus signinum*<sup>97</sup> whilst the basins excavated within factory n.1 at Tahadart are arranged around an open area of concrete, further similar rooms to the south will have served a similar function in the washing of the fish.<sup>98</sup> The numerous salting installations excavated at Lixus seem to have been similarly provided.<sup>99</sup> The widespread appearance of such areas would point to their having served an integral role in the production of sauces and they seem to have been specifically designed to facilitate their cleaning. Difficulties in the transportation of fish, particularly already desiccated, as well as the close proximity of these areas to the *cetariae* used in their salting may suggest not only that they were used in the cleaning of the fish prior to immersion in brine, but also that they were used in the dissection of the catch as well.

Amongst the best known of the salting installations within Hispania Tarraconensis is that of Rosas which appears to have been given over to the salting of fish during the Late Empire. The area to the SE of the later Imperial complex (area G) seems to have formed the saltery (**fig. 16-17, pl. 15**). The tanks are arranged along the north and east sides of G-V with the remaining area of 4,15x3,15/3,55m being lined with *opus signinum*.<sup>100</sup> Further basins lined with *opus signinum* have been found within G-VII and G-VIII. That these were used in the cleaning of the installation seems clear from the construction of a drain measuring 0,20m and constructed from stone and clay covered in *opus signinum* which runs from G-IV along the northern wall of G-V and seems to have served to remove the waste from the fish processing area.<sup>101</sup> G-IV seems to have possessed a floor of lime and in the western corner a well has been excavated. This area would appear to have been used in the cleaning and dissection of the fish prior to moving them into the salt vats located in G-V. A similar arrangement is also to be seen in the fish factory at Santa Pola (**fig. 18, pl. 16**).<sup>102</sup> Adjoining five tanks lined with *opus signinum* was found an area of 6x4m with a similar flooring to that identified

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<sup>97</sup> cf Amores, F (1978) op. cit. n. 71 p 4443.

<sup>98</sup> cf Ponsich, M (1988) op. cit. n. 13 p 140-145.

<sup>99</sup> cf Ponsich, M (1988) op. cit. n. 13 p 120-136.

<sup>100</sup> cf Nolla i Brufau, J Ma (1984) op. cit. n. 69 p 440; Nolla i Brufau, J Ma and Nieto Prieto, F J (1981) "Una factoria de salao de peix a Roses" in *Fonaments* 3 p 192-194.

<sup>101</sup> cf Nolla i Brufau, J Ma (1984) op. cit. n. 69 p 442.

<sup>102</sup> cf Sanchez Fernandez, Ma J, Blasco, E and Guardiola, A (1989) op. cit. n. 24 p 416-419.

within the basins themselves. The pavement is well preserved and is inclined to the SW by 13cm. Adjoining it is found a drain built of two walls of stones measuring 20-25cm in width and which runs for about 6m to the west. Although the excavators have expressed reticence about defining the function of this area<sup>103</sup>, it would appear to have been used in the preparation of the fish as we have cited elsewhere.

No other factory excavated thus far within Tarraconensis has provided such a coherent picture of the installation as a whole as those at Santa Pola and Rosas, however, it is possible that similar facilities can be identified within the fish factory at Punta de l'Arenal (**fig. 19**). Although it is impossible to gain a coherent picture of the organisation of the activities undertaken at the site, amongst the finds excavated in 1964 is the so-called 'Habitación A' which may have served a similar function to that outlined above (**pl. 17**). The remains consist of a pavement of rough stone and lime measuring 8x7m which is surrounded by a furrow measuring 30cm in width. This would appear to have served as a drain being connected to a concrete channel which drains to the beach. In each of the four corners of the structure there appear to be the remains of post holes which would have supported some form of roofing above the washing area beneath.<sup>104</sup> Such an open air structure is known from factories elsewhere, most notably at Belo and the building would appear to have been used for the dissection of the fish.<sup>105</sup> Of 'Habitación B' only a single corner remains (2x1m) although this would appear to have been lined with *opus signinum* and may also have served in the preparation of the fish (**pl. 18**).<sup>106</sup> Although no further structures of a similar function have been found within the attested factories of Tarraconensis it seems a reasonable supposition on the basis of their ubiquity in the production of fish sauce that such existed and that their absence is a consequence of the paucity of archaeological evidence, not an alternative method of production.

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<sup>103</sup> cf Sanchez Fernandez, Ma J, Blasco, E and Guardiola, A (1989) op. cit. n. 24 p 416: *En relación a este conjunto se encuentra una dependencia rectangular de 6 por 4m, que presenta en el ángulo E una estructura cuadrada de 1,25m de lado formada por pequeños piedras, bordeadas al exterior por otras de gran tamaño, cuya función no es posible determinar por el momento.*

<sup>104</sup> cf Martin, G and Serres, Ma D (1970) op. cit. n. 24 p 43-44.

<sup>105</sup> Its use in the washing of the fish is also possible but the lack of any provision for fresh water in the immediate vicinity may point against this. One might also note, perhaps, the provision of a drying area within the factory at Trafalgar.

<sup>106</sup> cf Martin, G and Serres, Ma D (1970) op. cit. n. 24 p 44-45.

Once the fish had been washed and divided up into its constituent parts, the dissected fish would be placed in a container interspersed with alternating layers of salt in order to enable the even diffusion of salt amongst the fish for a period of up to three months. The most common form of container used in this process seems to have been the *cetariae* or vats that are the most widely attested evidence for the existence of a fish saltery. In general these would have been built from *opus incertum* and lined with a layer of *opus signinum*<sup>107</sup> the corners of the tank being rounded to facilitate its cleaning and to reinforce the walls. Finds of *tegulae* within the vicinity of the basins may point to their having been covered.<sup>108</sup> What is perhaps most striking is that only in the case of those from Rosas can I cite the existence of any facility for the draining of the basin.<sup>109</sup> Although such is valid as a cursory description of the form which *cetariae* took, their precise size and location was subject of considerable variation. In a number of installations such as Cotta, Troia, Belo, Santa Pola and Rosas it is possible to speak of a coherent grouping of tanks, whether it be in an urban or rural context, often termed a 'factory'. At other sites the arrangement of basins seems less coherent, as for example at Punta de l'Arenal and Cabrera - such perhaps being indicative either of a smaller scale of production or perhaps a process more in accord with the description of Manilius. Many such installations do, however, fall between these two extremes, as seems particularly to be the case along the Atlantic coast of the Straits of Gibraltar in Baetica and Lusitania.<sup>110</sup> Curtis has established a tripartite definition of the typology:<sup>111</sup> three forms of vat are attested on the basis of their having been located upon beaches, rocky promontories or within buildings of some type. In the case of those situated on the beaches the vat would be sunk into the ground, a style also encountered on rocky promontories although free-standing vats are also found in such sites. The grouping of vats mentioned above would point to their having been located within a structure of

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<sup>107</sup> Ponsich, M (1988) op. cit. n. 13 p 81 states that three layers of *opus signinum* would be used in order to waterproof the tank.

<sup>108</sup> cf Fernández Ochoa, C and Martínez Maganto, J (1994) op. cit. n. 67 p 127.

<sup>109</sup> Ponsich, M (1988) op. cit. n. 13 p 81 cites no such provision having been found: *No se han encontrado ningún punto de evacuación en estas pilas; únicamente una pequeña cubeta semiesférica en el centro permitía recuperar los desperdicios durante su limpieza.* Elsewhere within the Western Mediterranean, similar facilities have been identified at Alcazarsegher in North Africa.

<sup>110</sup> cf Mesquita de Figueiredo, A (1906) "Ruines d'antiques établissements a salaisons sur le littoral sud de Portugal" in *Bulletin Hispanique* 8.2 p 109-121.

<sup>111</sup> cf Curtis, R I (1991) op. cit. n. 62 p 54-55.

some sort. A degree of economic distinction may also be evidenced by the organisation of *cetariae*. The grouping of large numbers of basins within the same chronological and geographical horizons, as for example at Guéthary<sup>112</sup> and in the vicinity of Troía<sup>113</sup>, may point to 'industrial' exploitation. More scattered patterns of *cetariae* are often located in relation to *Villae Maritimae* and would appear, therefore, to have operated as a component of the villa economy and to have been dependent upon the activities of the estate as a whole. More independent operations can be seen in the centralised grouping of vats within a wider complex providing facilities for heating, fresh water supply and the storage of amphorae and other raw materials such as salt. The primary economic function of these installations would appear to have been the salting of fish and other associated activities and in this they can be categorised as an industrial process, although the smaller scale of such might prefer the epithet 'Commercial' exploitation. Lack of supporting evidence does, however, preclude the definite application of this categorisation and allowance must be made of the considerable variations in scale to be found in the different categories, but it may prove fruitful to view the Tarraconensian installations through this perspective.

With the current state of the archaeological evidence as it is it is impossible to locate fish sauce production within Tarraconensis on a sufficient scale to be adjudged 'industrial' production. The scattered attestations in the vicinity of Carthago Nova have not afforded sufficient evidence upon which to base conclusions whilst a similar reservation can be leveled at the increasing number of salteries identified within the area of Alicante. Some concentration of production may have existed between the fisheries at Punta de l'Arenal and Punta del Castell and the saltery at Acequia de Noria. I would, however, suggest that the operation in the vicinity of Javea is rather a developed villa economy and essentially seasonal in focus - however the evidence for such is beyond the confines of the attested *cetariae*. Rather we see within Tarraconensis the utilisation of scattered patterns of *cetariae* suggesting perhaps that they function as part of the villa economy, and the incidence of centralised complexes similar to the individual factories located at Belo and elsewhere in the south.

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<sup>112</sup> cf Fernández Ochoa, C and Martínez Maganto, J (1994) op. cit. n. 67 p 127.

<sup>113</sup> On Troía, cf Etienne, R, Makaroun, Y and Mayet, F (1994) op. cit. n. 93.

Traditionally the use of rock-cut *cetariae* has been associated with the production of fish sauce in Tarraconensis - a characteristic particularly associated with the use of *piscinae* in the entrapment of fish.<sup>114</sup> These would be constructed in two ways: either cut directly out of the rock and lined with clay/lime, or a basin would be built on the surface as a freestanding structure. As one would expect, the former of these survives best in the archaeological record and is the most frequently attested within the region. Ten such basins were located by Gabriella Martin on the promontory of Punta de l'Arenal.<sup>115</sup> These were divided into two types: those that were lined with *opus signinum* and those that do not preserve any such traces of internal facing. The size of the excavated basins varied considerably, the largest being deposits 7 and 8 which measured 10 by 5m and were about 3m deep, and they are generally provided with convex corners to reinforce the walls of the basin. As well as finds of *tegulae* from the basins which we have referred to earlier, large quantities of Terra Sigillata have been found; principally South-Gaulish wares as well as Arretine vessels, Sigillata Hispanica and Sigillata Clara A dated to the First and Second Centuries AD.<sup>116</sup> Quantities of unclassified coarse wares were also found which may have been used in the preparation of the fish sauce and in its subsequent bottling.<sup>117</sup> As well as these rock-cut *cetariae* two free-standing basins were identified (**fig. 19**). Constructed out of *opus signinum* these were reinforced by convex corners and they are generally smaller than the excavated types, measuring 1,75x1,35m and 0,85m deep, and 0,78x0,62m respectively.<sup>118</sup> The former possesses an indentation in the base, similar to those attested at Rosas which may have been used in the cleaning of the tank. Sadly the reason for the differentiation between the two forms of vat is unclear and the only parallel with the free-standing basins that I can cite are those located within the fish-salting complex at Trafalgar.<sup>119</sup> Several of the basins at Punta de l'Arenal are associated

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<sup>114</sup> cf Martin, G (1970) op. cit. n. 24 p 151.

<sup>115</sup> Deposits 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13; cf Martin, G and Serres, Ma D (1970) op. cit. n. 24 p 40-43.

<sup>116</sup> cf Martin, G and Serres, Ma D (1970) op. cit. n. 24 p 22-34.

<sup>117</sup> cf Martin, G and Serres, Ma D (1970) op. cit. n. 24 p 38.

<sup>118</sup> cf Martin, G and Serres, Ma D (1970) op. cit. n. 24 p 40.

<sup>119</sup> cf Amores, F (1978) op. cit. n. 71 p 442.

with small circular basins which have produced fragments of *dolia*.<sup>120</sup> The purpose of these smaller containers is unclear although the use of such in the production of fish sauce is described by Manilius.<sup>121</sup> The garum recipes of Ps.-Rufius Festus and Ms. Lat. 11219 both refer to the use of pots in the production of garum to which heat would be applied so as to hasten the process.<sup>122</sup> Particularly significant is the description of the Geoponica<sup>123</sup> which cites both the use of earthenware pots as containers for the production of sauces and that the containers should be covered - advice that would appear to have been followed if the presence of *tegulae* can be taken as indicative.

Individual rock-cut *cetariae* are widely attested within the provinces of Alicante and Valencia. Gabriella Martin has noted the existence of basins at Santa Pola<sup>124</sup>, Tossal de Manises<sup>125</sup>, whilst those cited by Figueras Pachero as being located at Acequia de Noria are no longer extant.<sup>126</sup> Three rock cut basins were sited upon the promontory of Punta del Castell (**fig. 20-21**).<sup>127</sup> The basins are located along the immediate shoreline and preserved measurements of 2x3,20m, 1,60x1,60m and 1x0,80m with the attested pottery paralleling that of Punta de l'Arenal. At the time of the author's visit to the site in 1994 the remains had suffered badly as a consequence of erosion and later development in the vicinity, making it impossible to form any definite opinion as to the function of the site although the lack of evidence of *opus signinum* is worth noting. Such was the apparent predominance of the utilisation of rocky promontories as locations for *cetariae* of this type that the existence of such has been suggested by Martin at L'Almadrava (Setla-Mirarosa-Miraflor) and Cullera to the north<sup>128</sup> - an interpretation that has been followed by subsequent surveys of the

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<sup>120</sup> cf Martin, G and Serres, Ma D (1970) op. cit. n. 24 p 41-43: alongside deposit 3 was found a circular basin measuring 0,95m in diameter by 1,15m deep; similarly adjoining n. 13 was found a smaller basin of 0,87m diameter by 1,07m depth, whilst two such were related to deposit 6.

<sup>121</sup> cf Curtis, R I (1991) op. cit. n. 62 p 54. *Dolia* were used in the preparation of fish sauce at Pompeii, cf Curtis, R I (1979) "The Garum Shop of Pompeii" in Cronache Pompeiane 5 p 5-23.

<sup>122</sup> cf Chapter 1.

<sup>123</sup> Geoponica 20.46.1-6.

<sup>124</sup> Presumably at the mouth of the R. Vinalopo, cf Martin, G (1970) op. cit. n. 24 p 147, cf also Ponsich, M (1988) op. cit. n. 13 p 174.

<sup>125</sup> cf Martin, G (1970) op. cit. n. 24 p 147.

<sup>126</sup> cf Figueras Pachero, F (1945) op. cit. n. 24 p 10-11.

<sup>127</sup> cf Martin, G (1970) op. cit. n. 24 p 148-149; cf also Martin, G and Serres, Ma D (1970) op. cit. n. 24 p 91, Ponsich, M (1988) op. cit. n. 13 p 171-172.

<sup>128</sup> cf Martin, G (1970) op. cit. n. 24 p 149-150.

subject.<sup>129</sup> Although both sites have produced evidence of Roman occupation through to the Fourth Century AD<sup>130</sup>, I have not been able to support Martin's assertion of the existence of *salinae* at the former whilst evidence from Cullera is insufficient to form any opinions as to the form which the Roman presence at the site took. Comparable types of fish tanks are known at a number of locations within the Straits of Gibraltar and Martin is probably incorrect in stressing the uniqueness of Alicantean factories. It has, in fact been noted that particular similarities exist between installations along the eastern coast of Tarraconensis and various fisheries in southern Italy and Sicily: at Santo Janni and Capo la Secca in Italy<sup>131</sup> and S.Vito and Cala Minnola in Sicily.<sup>132</sup> One should not emphasize the heterogeneity of these sites to the exclusion of others as they bear comparison with the installations referred to above along the Atlantic coasts of the Straits of Gibraltar and I remain quizzical of the link that has been proposed. Also worth citing are installations located elsewhere within the province of Tarraconensis such as at Gijón<sup>133</sup> (Asturias) and Isla de Cabrera (Balearics)<sup>134</sup> which produce the same forms of *cetariae*, particularly at the latter which appears to have possessed a pair of small circular basins lying in the vicinity of the largest of the vats, n. 10.

As well as the utilisation of more scattered patterns of *cetariae* lying on the rocky promontories of Alicante and Valencia, there are also attested grouped

<sup>129</sup> cf Sanchez Fernandez, Ma J, Blasco, E and Guardiola, A (1989) op. cit. n. 24 p 435, Ponsich, M (1988) op. cit. n. 13 p 169-171.

<sup>130</sup> Cullera: cf Garcia Villanueva, I and Rossello Mesquida, M (1992) "Las anforas Tardorromanas de Punta de l'Illa de Cullera" in Estudios de Arqueologia Iberica y Romana. Homenaje a Enrique Pla Ballester TV del SIP num. 89 p 639-657, Mateu y Llopis, F (1973) "Bronces romanos imperiales y vandalos en l'Illa de Cullera" in APL 13 p 241-256. L'Almadrava: Abascal, J M and Gisbert Santonja, J A (1991) "Numismatica y evidencia arqueologica en el alfar Romano de la Almadrava (Setla-Mirarosa-Miraflor)" in Lucentum 9-10 p 133-160, Abascal, J M and Gisbert Santonja, J A (1992) "Epigrafia Romana de la villa de l'Almadrava (Setla-Mirarosa-Miraflor). Apendice: nuevas aportaciones a la epigrafia de Dianium (Denia, Alacant)" in III Congres d'Estudis de la Marina Alta (Alicante) p 69-78, Gisbert Santonja, J M (1987) "La produccio de vi al territori de Dianium durant l'Alt Imperi: el taller d'amfores de la villa Romana de l'Almadrava (Setla-Mirarosa-Miraflor)" in El Vi a l'Antiguitat Economia, Produccio i Comerc al Mediterrani Occidental Actes I Colloqui d'Arqueologia Romana (Museo de Badalona) Monografies Badalonines num. 9 p 104-118.

<sup>131</sup> cf Bottini, P and Freschi, A (1993) Sulla Rotta della 'Venus': storie di navi, commerci e ancore perdute - Catalogo della mostra - Maratea 1991 (Ministerio beni Culturali e Ambientali and Centro Culturale Maratea) (Taranto) p 96-110.

<sup>132</sup> cf Purpura, G (1982) "Pesca e stabilimenti antichi per la lavorazione del pesce in Sicilia: I - S. Vito (Trapani), Cala Minnola (Levanzo)" in Sicilia Archaeologica 15.48 p 45-60.

<sup>133</sup> cf Fernández Ochoa, C (1994) op. cit. n. 3.

<sup>134</sup> cf Hernandez, Ma J, Angel Cau, M and Orfila Pons, M (1992) "Nuevos datos sobre el poblamiento antiguo de la isla de Cabrera (Balears). Una posible factoria de salazones" in Saguntum 25 p 216.

complexes of tanks which appear - at least in the case of those at Rosas and Empúries - to have been located within buildings and which, to judge by the scale of associated ancillary structures, to have been of a more specialised function than those located elsewhere within the region. The salting of fish seems to have been confined to a single room of the factory at Rosas (G-V). In the original layout of the structure five basins were arranged along the north and east walls of the dwelling, whilst at a subsequent point in the occupation of the site the first basin was subdivided into two.<sup>135</sup> All five vats were built to the same specifications, supported by the external wall of the house and on the inside by a stone wall measuring 0,30m in width. The internal divisions of the basins were constructed in the same manner with the internal faces of the tanks being lined with *opus signinum*. Three, and possibly all, of the tanks were provided with conduits linking the lowest point of the sloping base of the vat with a receptacle sunken into the floor of the room. They are located in front of basins 1, 4 and 5 and appear to have been used to clean the tanks - which may explain the lack of concavities used in such vats elsewhere for the same purpose. The extant vats (1, 3, 4, 5) measure 1,85x1,80m, 1,60x1,75m, 1,65x1,65m and 1,60x1,65m giving relative capacities of 2,16m<sup>3</sup>, 1,52m<sup>3</sup>, 1,90m<sup>3</sup> and 1,50m<sup>3</sup>.<sup>136</sup> More typical of the vats found elsewhere is the single vat located in room G-VIII. The tank is lined with *opus signinum* and in the centre of the base there is a sunken bowl used to collect refuse from the basin when cleaning.<sup>137</sup> The reasons for the location of such a tank so close to the principal salting area is unclear although it may be a consequence of the production of different varieties of sauce. A similar complex of tanks has been excavated at Santa Pola where five tanks have been excavated within the north-west corner of a fishery covering an area of 56,40m<sup>2</sup>. The tanks are excavated out of the ground and the methods employed in their construction are typical of those attested elsewhere. The walls are constructed out of stone bonded by clay. The interior face of the tanks is reinforced by two layers of mortar and one of *opus signinum* to provide waterproofing. Further support is provided by circular mouldings in the corners. Four of the tanks seem to be contemporary with the fifth being added at a later stage in the operation of the fishery.

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<sup>135</sup> cf Nolla i Brufau, J Ma (1984) op. cit. n. 69 p 439-440.

<sup>136</sup> cf Nolla i Brufau, J Ma (1984) op. cit. n. 69 p 439.

<sup>137</sup> cf Nolla i Brufau, J Ma (1984) op. cit. n. 69 p 441.

Its form of construction is the same as that attested in the other four but it is better finished and preserved. In the corner of the tank there is a sunken concavity in the floor which presumably served a similar function to those found elsewhere.<sup>138</sup>

Following the fermentation of the fish-brine solution the resulting gradations of sauce would be drawn off, the highest qualities being strained to remove impurities, evidence for which is afforded by the finds of terracotta sieves from the fishery at Benalua.<sup>139</sup> The sauces would then be bottled, either in amphorae for long distance exchange or in a variety of coarse ware vessels for more immediate use. That dependencies were given over to the storage of such vessels prior to shipment would seem likely although beyond the ceramic assemblage evidence for this is not readily forthcoming. One such storeroom has been excavated within the harbour of Carthago Nova<sup>140</sup>, although the relationship of this to the fisheries in the vicinity is unclear.

The combination of an area, often waterproofed with *opus signinum*, for the dissection of the fish and the *cetariae* used in the maceration of the fish in salt formed the principal components of a fish factory; however, we see that a number of associated structures also played a role in the production of salt fish. Thus far we have referred almost exclusively to the slower method of fish sauce production, however, both Ps-Rufius Festus and the *Geoponica* refer to a shorter method of fish sauce manufacture by which the salt-fish solution is placed in a vessel and heated until, according to Ps-Rufius Festus, the contents had been reduced by two-thirds. We shall discuss the vessels used in the process in chapter four; however, it is worth outlining the facilities utilised in the heating of the mixture.

The containers of fish sauce would be placed in an area equipped with heating facilities: often a furnace of some kind, although bath houses may also have been used. The presence of baths in the vicinity of fisheries is attested at a number of sites in the Iberian Peninsula and at several locations the baths are incorporated into the factory itself, as for example, we can see at Troía. The provision of the *caldarium* would provide an area in which the vessels of fish sauce could be stacked and heated, and it is

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<sup>138</sup> cf Sanchez Fernandez, Ma J, Blasco, E and Guardiola, A (1989) op. cit. n. 24 p 435, Ponsich, M (1988) op. cit. n. 13 p 415-416.

<sup>139</sup> cf Reynolds, P (1993) op. cit. n. 24 p 143, w11.9.8.

<sup>140</sup> cf Martín Camino, M, Pérez Bonet, Ma Á and Roldán Bernal, C (1991) "Contribución del área portuaria de Carthago Nova y su tráfico marítimo en época altoimperial" in *AEA* 64 p 272-283.

even possible that the baths themselves were used in the production of fish sauce. Several fisheries along the coasts of Southern Spain and North Africa include such baths: Senhora de Luz, San Pedro de Alcantara<sup>141</sup>, Sullectum<sup>142</sup>, whilst the factory at Tipasa was expanded to include a bath.<sup>143</sup> As well as the use of bath houses, several fisheries also included furnaces which will have served the same purpose, for example at Cotta and Tahadart in North Africa<sup>144</sup> and at Sanlúcar de Barrameda in Spain.<sup>145</sup> Evidence for such may also be afforded by the finds of cooking vessels within several installations and it is possible that such furnaces also served a role as kilns firing vessels used in the production and shipment of the sauces as well as meeting the immediate ceramic requirements of the fishery as a whole.<sup>146</sup>

Although evidence is relatively plentiful from the south for the use of heating installations within fisheries, it is far less pronounced on the east coast. Finds of cooking vessels within the fish salteries show that such were used but evidence for the furnace and bath-houses themselves is rare. A circular room with a hypocaust, perhaps dating to the Third Century AD has been found adjoining the necropolis and fishery at La Albufera.<sup>147</sup> Gabriella Martin has suggested that a bath-house may also be located at Punta de l'Arenal on the basis of finds of a number of ceramic columns from the site which are typical of those used in the construction of the hypocaust floor of a *caldarium*.<sup>148</sup> This may be related to the possible existence of a kiln within the site.<sup>149</sup> A number of kilns have also been located in the vicinity of the fish factory at La Isleta de Campello<sup>150</sup>, although their relationship to the fish factory is uncertain. The fishery located upon the Avenida Dr Gadea, Benalúa (Alicante) seems to have included two kilns, one for the production of bricks and the other for household articles, and a drying room (**fig. 19**).<sup>151</sup>

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<sup>141</sup> cf Curtis, R I (1991) op. cit. n. 62 p 56.

<sup>142</sup> cf Foucher, L (1968) "Note sur l'industrie et le commerce des Salsamenta et du Garum" in 93e Congrès national des Sociétés Savantes: Tours 1968 p 17-21.

<sup>143</sup> cf Curtis, R I (1991) op. cit. n. 62 p 67.

<sup>144</sup> cf Curtis, R I (1991) op. cit. n. 62 p 67.

<sup>145</sup> cf Curtis, R I (1991) op. cit. n. 62 p 56.

<sup>146</sup> cf chapter 4.

<sup>147</sup> cf Reynolds, P (1993) op. cit. n. 24 p 50.

<sup>148</sup> cf Martin, G and Serres, Ma D (1970) op. cit. n. 24 p 85.

<sup>149</sup> cf chapter 4.

<sup>150</sup> cf Reynolds, P (1993) op. cit. n. 24 p 45-46.

<sup>151</sup> cf Reynolds, P (1993) op. cit. n. 24 p 54.

It would appear, therefore, that both methods of fish sauce production described in the literary sources were employed within the Spanish fish salteries, but the apparent scarcity of evidence from Tarraconensis suggests that the quicker method was perhaps not as widely employed as has been implied elsewhere.<sup>152</sup> It is striking that such elaborate installations as those of Rosas and Belo for example include evidence of neither furnaces nor baths. Although the attested evidence is enough to suggest that such were employed in places to hasten the production of sauce, the sources give no indication of the quantities involved, in fact the use of small ceramic vessels would carry the supposition that the amounts will be at least smaller than those contained in *cetariae*. The comparative brevity of production and the relatively small quantities involved may mean that temporary, and thus largely undetectable, facilities will have been sufficient to meet such requirements. Production of *garum* by this method may have been undertaken on an *ad hoc* basis to meet the requirements of individual customers with the primary production taking place in *cetariae*.

A fishery would, therefore, have required *cetariae* and processing areas for the preparation and salting of the fish, as well as storerooms, furnaces, water deposits and *vivaria* also being attested. Such finds verify the methods of production described in the literary sources which appear to change little across much of the Mediterranean both temporally and geographically between the Punic and Visigothic periods. For a fuller understanding of the operation of the factories, however, we must look beyond the confines of the industrial complex and look at the associated find of *villae*, temples and necropoleis in order to define the functioning of these installations within the archaeo-economic horizons of the communities concerned.

### 3. THE FUNCTIONING OF A FISH FACTORY

In a recent discussion of Lusitanian fish sauce production, Jonathan Edmondson proposed a three tier structure of sauce manufacture: rural, urban and semi-urban.<sup>153</sup> Rural production centred upon *villae* with *cetariae* being found in relation to a number of such estates. In keeping with the autarchic principles applied to the operation of the

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<sup>152</sup> cf Curtis, R I (1991) op. cit. n. 62.

<sup>153</sup> cf Edmondson, J C (1990) "Le Garum en Lusitanie urbaine et rurale: hierarchies de demande et de production" in Gorges, J G (ed) *Les Villes de Lusitanie Romaine* p 141-146.

villa, they functioned as the principal rural economic unit being concerned with the exploitation of the resources at its disposal. As well as agricultural and other commodities this also included, in the case of *villae maritimae*, the resources of the sea. Although the villa economy seems, on the whole, to have been primarily geared to self-sufficiency, a tendency exists, particularly in the case of more developed industrial processes, for the economic function of the villa to be expanded - as is evidenced by the association of *villae* with towns.

Fish sauce production in an urban context is well attested within the Iberian Peninsula; one particularly thinks of the factories at Belo. The importance of towns in the exploitation of marine resources is well evidenced by the interdependence of *villae* upon urban centres both in terms of the provision of an available labour force, but also in the presence of an immediate demand without recourse to transportation. As we have seen, the provision of facilities both for fishing and for the subsequent redistribution of the product were important criteria in the establishment of a fishery with both being satisfied by proximity to an urban centre. Although rural production can be linked with the operation of the wider estate, the operation of urban production is more difficult to define: unity of ownership, and thus scale of production cannot be defined amongst such scattered fisheries as appear at a number of urban centres along the south coast.

More problematic is the definition of semi-urban production which Edmondson himself links with the existence of *vici*.<sup>154</sup> Although only the fishery at Troia is cited in this regard, it is possible that other ostensibly 'rural' factories should be included within this category. *Vici* functioned as essentially non-urban centres often based upon an economic function.<sup>155</sup> Such communities develop as a consequence of a need or desire to exploit a specific resource, whether it be the satisfaction of the requirements of a specific community, as for example, the presence of a military base, or a *mansio*; or the exploitation of a natural resource, as in the mining communities of the Peninsula.<sup>156</sup>

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<sup>154</sup> cf Edmondson, J C (1990) op. cit. n. 153 p 146.

<sup>155</sup> The term 'small-towns' is also used to describe *vici*.

<sup>156</sup> cf Doumergue, C (1990) *Les Mines de la Péninsule Ibérique dans l'Antiquité Romaine* Collection de l'École Française de Rome 127 (Rome); Edmondson, J C (1987) *Two Industries in Roman Lusitania* BAR Int. Ser. 362 (London); Edmondson, J C (1989) "Mining in the later Roman Empire and beyond:

Although the existence of such cannot be securely identified in relation to fisheries, their existence may be evidenced by the association of necropoleis and temples with salting installations. Many such communities will have remained limited in scope and it is difficult to differentiate between production of sauces within the context of *vici* or *villae*. Whilst villa-based production will have remained essentially seasonal in operation in order to conform to the constraints and manpower of the agricultural calendar, in fact the height of the tunny season will have required much of the agricultural labour force of the surrounding region.<sup>157</sup> It is within this dichotomic category that we must consider much of Tarraconensian production.

Traditionally the foul character of fish sauces<sup>158</sup> was believed to have precluded the establishment of fisheries within urban contexts. Increased excavation has, however, shown that such was a relatively widespread occurrence - particularly important when considering the scale of employment that seems to have been necessary during the tunny season and the importance of access to markets. Particularly noted in regard to the production of salt-fish in an urban context is the industry based in Carthago Nova. Little is known of the operation of the industry here and it is variously located in Carthago Nova itself or on the island of Scombraria a short distance off the coast.<sup>159</sup> Although no salteries have been located within the confines of the city itself, the existence of such would appear to be suggested by the discovery of deposits of unused

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continuity or disruption?" in *JRS* 79 p 84-102; Richardson, J S (1976) "The Spanish Mines and the Development of Provincial Taxation" in *JRS* 66 p 139-152.

<sup>157</sup> Ponsich, M (1988) op. cit. n. 13 p 92, the Duke of Medina Sidonia is said to have employed thousands in his three almadras. Such was the scale of investment required by such operations that Ponsich has suggested a degree of governmental involvement, at least in the post-Roman period.

<sup>158</sup> cf chapter 1.

<sup>159</sup> Pliny tells us that *nunc e scombro pisce laudatissimum in Carthaginis Spartariae cetariis - sociorum id appellatur- singulis militibus nummum permutantibus congios fere binos. nec liquor ullus paene praeter unguenta maiore in pretio esse coepit; nobilitatis etiam gentibus.* (*Naturalis Historiae* XXXI-43, 93-94). Strabo refers to the existence of a large-scale fish-salting industry in the region but locates the centre of the industry away from Carthago Nova itself, on an island a short distance from the coast, which was known as Scombraria after the scomber fish that was caught there and from which the finest fish sauce was considered to be made, cf Strabo *Geography* 3.4.6: εἶθ' ἢ τοῦ Ἡρακλέους νῆσος ἤδη πρὸς Καρχηδόνι, ἣν καλοῦσι Σκομβραρίαν ἀπὸ τῶν ἀλισκομένων σκόμβρων, ἐξ ὧν τὸ ἀρίστον σκευάζεται γάρων. Claudius Ptolemaeus also refers to the existence of Scombraria (11-6.14). Athenaeus (*Deipnosophistae* III.121) reiterates the description given by Strabo: "τράβων δ' ἐν ἡ Γεωγραφικῶν πρὸς ταῖς Ἡρακλέους φησὶ νήσοις κατὰ Καρχηδόνα τὴν καινὴν πόλιν εἶναι Σεξιτανίαν, ἐξ ἧς καὶ τὰ τὰρίχη ἐπωνύμως λέγεσθαι, καὶ ἄλλην Σκομβροαρίαν ἀπὸ τῶν ἀλισκομένων σκόμβρων, ἐξ ὧν τὸ ἀρίστον σκευάζεται γάρων. cf also Galen XII - 637 K; Dioscorides *De Materia Medica* I - 54.

Dr 7-11 amphorae in the ancient harbour area.<sup>160</sup> The factory at Santa Pola is located near the harbour area of Portus Illicitanus as well as within the vicinity of an earlier Iberian community. Similarly the factory at Rosas is located a short distance to the south of the settled area of the *Barrio Helenístico* on the hill of Santa María.<sup>161</sup> Roman settlement appears in the First Century AD and continues until the Sixth Century AD and it seems to have remained an important centre into the Visigothic period issuing coinage in the reign of Leovigild (568-586 AD).<sup>162</sup> The presence of a substantial population would be evidenced by the growth of a necropolis to the south following the abandonment of the fishery.<sup>163</sup> Also on the Bay of Rosas, the Neapolis of Empúries includes a small salt fishing installation (pl. 22)<sup>164</sup> although the dating and function of this cannot be further defined: it may have served rather as a shop for the resale of sauces in the manner of that from Pompeii than as a production area in its own right. The less well attested factory at Tossal de Manises would also appear to have been placed within an urban context, although this is as yet mere supposition.<sup>165</sup>

Edmondson has recently attempted to define the urban character of fish sauce production on the basis of the concentration of *garum* amphorae within urban centres: Emerita, Scallabis, Pax Iulia, Salacia, Eborac, Conimbriga, Aeminium, Mirobriga, Balsa, Ossonoba, and Setúbal.<sup>166</sup> His hypothesis is erroneous, I believe on two counts. Firstly, archaeological survey, despite attempts to redress this imbalance<sup>167</sup>, remains concentrated upon urban centres - a bias that is particularly apparent in respect to amphorae for which quantified deposits exist only in urbanised centres to the exclusion of rural sites. Secondly, as shall be suggested in chapter four the local distribution of fish sauces may well have been carried in less readily defined forms of ceramic vessel

<sup>160</sup> cf Martín Camino, M, Pérez Bonet, Ma Á and Roldán Bernal, C (1991) op. cit. n. 140.

<sup>161</sup> cf Nolla i Brufau, J Ma (1984) op. cit. n. 69 p 431-432.

<sup>162</sup> A triens bears the inscription: CUM D I RODA, cf Miles, G C (1952) *The Coinage of the Visigoths in Spain: Leovigild to Achila II* Hispanic Numismatic Series n. 2 (New York).

<sup>163</sup> cf Nolla i Brufau, J Ma (1984) op. cit. n. 69 p 445.

<sup>164</sup> cf Sanmartí Grego, E and Nolla i Brufau, J M (1988) *Empúries* (Barcelona) p 30.

<sup>165</sup> On the urban centre at Tossal de Manises, cf Llobregat, E A and Tarradell, M (1969) "Avance de los resultados de las excavaciones arqueológicas en curso en el Tossal de Manises (Alicante) durante los meses de agosto a noviembre de año 1966" in *NAH* 10-12 p 141-146.

<sup>166</sup> cf Edmondson, J C (1990) op. cit. n. 153 p 141

<sup>167</sup> cf Fitzpatrick, A (1985) "The distribution of Dressel 1 amphorae in North-Western Europe" in *OJA* 4 p 305-321; Fitzpatrick, A (1987) "The structure of a Distribution map: problems in sample bias and quantitative studies" in *Rei Cretariae Romanae Fautorum* 25/26 p 70-112, on systems of sampling and the problems thereof.

than amphorae. Towns acted as points of redistribution and long distance exchange and thus will have had a greater access to amphora-borne produce than the more localised rural sites relying upon commodities brought in from the nearby centres - a supply that will not necessarily have required amphorae.

Even within those factories located away from urban centres, such will have played a central role in the provision of resources and manpower. Where located beyond the confines of towns, the fisheries are provided with routes of access both to the hinterland and beyond. Although few fisheries have been excavated on a sufficient scale to be able to define their economic and geographical location, several along the east coast seem to have been located in relation to *villae*. Although the *villae* themselves have often not been identified, finds of architectural decoration are relatively common within fisheries and point to the existence of a non-utilitarian dwelling in the immediate vicinity. It has been suggested<sup>168</sup> that much of the settlement of Valencia took the form of *villae* rather than towns and this is seen in the distribution of fisheries.

The presence of a villa at Punta de l'Arenal seems likely on the basis of finds of painted stucco, columns and capitals from the site.<sup>169</sup> To judge by the scale of the finds, the villa must have been of some importance, although it does not seem to have been rebuilt following its destruction by fire in the late Second Century.<sup>170</sup> At Calpe settlement seems to have shifted from the Peñón d'Ifach by the Second Century BC<sup>171</sup> to a number of *villae* located along the coast with ruins and mosaic pavements having been found along the Ensenada de Calpe.<sup>172</sup> Much of the evidence for these has been destroyed; however, in his excavations of the Baños de la Reina, Cavanilles identified the remains of a villa a short distance inland.<sup>173</sup> Unfortunately the lack of any record of the finds from his excavations hampers the interpretation of this site. In 1965, M. Pellicer carried out further work on the polychrome mosaics from the site. The majority

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<sup>168</sup> cf Figueras Pachero, F (1945) op. cit. n. 24.

<sup>169</sup> cf Martin, G and Serres, Ma D (1970) op. cit. n. 24 p 18-22.

<sup>170</sup> cf Gorges, J G (1979) *Les Villas Hispano-Romaines* (Paris) p 184.

<sup>171</sup> cf Aranegui Gasco, C (1973) "Materiales arqueologicos del Penon de Ifac (Calpe)" in *PLAV* 9 p 54-56: the only subsequent finds consist of a single fragment of sigillata clara D, a few Roman coarse wares, glass and marble. A Lamboglia IA vessel from Marseilles has been found and dated to the Second Century BC.

<sup>172</sup> cf Schulten, A (1927) op. cit. n. 36 p 227.

<sup>173</sup> cf Cavanilles, A J (1795) op. cit. n. 29.

of the mosaics seem to have been of local construction and in terms of composition they are dated to the mid-late Second Century AD. Quantities of sigillata, principally of forms A and D were also found and occupation would appear to have continued into the Fourth Century AD.<sup>174</sup> Similarly the fishery identified at La Isleta de Campello<sup>175</sup> would appear to have been part of a villa, as may those at Els Munts and Salou.<sup>176</sup> The factory excavated at Santa Pola is probably associated with the adjoining Imperial villa.<sup>177</sup> Beyond the presence of *villae*, however, no fishery has afforded other evidence of non-industrial dwellings leading to the hypothesis that such factories utilised migrant workers who would follow the tunny migrations, sleeping on the beaches and processing the catch in the manner described by Manilius - an activity which survives to the present day. There is, however, some evidence to suggest that fisheries did act as centres as population and that production would appear to have taken place within the context of *vici*.

Although residential dwellings are conspicuously absent, several fisheries have afforded evidence for the presence of a substantial populace within the vicinity, thus for example, we see the presence of a theatre at Carteia<sup>178</sup> whilst temples are relatively well known in the proximity of fisheries. Schulten, following a proposition of Carpenter<sup>179</sup>, identified the remains of a temple at Calpe possibly dedicated to Venus Marina. Adjoining the fishermen's quarter at La Isleta de Campello have been identified two small temples.<sup>180</sup> More significant, however is the widespread coincidence between fisheries and necropoleis. We have already referred to the replacement in the Seventh Century of the fishery at Rosas with a necropolis to the south, but it would appear to have been a common occurrence for a cemetery to be located in the proximity to a fish

<sup>174</sup> cf Gorges, J G (1979) op. cit. n. 170 p 181.

<sup>175</sup> cf Figueras Pachero, F (1934) op. cit. n. 25, cf also Reynolds, P (1993) op. cit. n. 24 p 45-46.

<sup>176</sup> cf Carreté, J Ma, Keay, S J and Millett, M (1995) A Roman Provincial Capital and its Hinterland: the Survey of the territory of Tarragona, Spain, 1985-1990 JRA Supplementary Series 15 (Ann Arbor) p 106. This view is based only on the presence of *villae* in the vicinity as I have been unable to find any supporting evidence for the existence of fish vats at these locations, cf also Balil, A (1964) Colonia Iulia Augusta Paterna Faventia Barcino (Barcelona). The association of *villae* with fisheries can be seen beyond the Peninsula, as for example at Capo la Secca dated from the second half of the First Century BC to the Fourth Century AD, cf Bottini, P and Freschi, A (1993) op. cit. n. 131 p 105-106.

<sup>177</sup> cf Reynolds, P (1993) op. cit. n. 24 p 55.

<sup>178</sup> cf Ponsich, M (1988) op. cit. n. 13 p 184.

<sup>179</sup> cf Carpenter, R (1925) The Greeks in Spain (Bryn Mawr), Schulten, A (1927) op. cit. n. 36 p 227.

<sup>180</sup> cf Reynolds, P (1993) op. cit. n. 24 p 45.

saltery. Evidently such establishments could be expected to include a sufficient population to warrant such.

The presence of burials at Muntañar in the vicinity of Punta de l'Arenal has long been recognised with Figueras Pachero referring to the discovery of coinage dating to the reign of Augustus and a Visigothic fibula.<sup>181</sup> In the course of two seasons of excavations in 1985 and 1989, 45 burials were excavated.<sup>182</sup> It appears to have been in use from the First to the Seventh Centuries AD, with a coin of Constantius II having been found within burial 44<sup>183</sup>, an Isings 28 *unguentario* from tomb 15, dated to the Second Century AD and a sigillata 'lucente' vessel of Lamboglia 14/26 form that is dated to the Fourth Century.<sup>184</sup>

Similar necropoleis have been identified adjoining the fishery at La Albufera where it is dated to the Fifth to Seventh Centuries AD,<sup>185</sup> whilst a buckle similar to that from Muntañar has been found within the cemetery at Tossal de Manises.<sup>186</sup> Burials are also located in relation to the fish factory at Avenida Dr Gadea, Benalúa which dates to the Fifth Century AD.<sup>187</sup> To the west of the fishery at Santa Pola has been found a burial dated to the early Third Century AD which may have been part of the cemetery reported by Belda in the vicinity for which no details survive.<sup>188</sup> The Necropolis de El Enginent was excavated by Belda and lies about 500m to the north-west of the villa complex at Calpe with which it is probably associated. The pottery found is largely unrecorded but a date in the Fifth Century is possible.<sup>189</sup> Martin and Serres also record the existence of burials in the immediate vicinity of Punta del Castell which appear to be unrelated to those from Muntañar.<sup>190</sup>

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<sup>181</sup> cf Figueras Pachero, F (1945) op. cit. n. 24 p 8-9.

<sup>182</sup> cf Bolufer i Marques, J (1986) "La Necropolis del Muntanyar" in *Xabiya* 1 p 109-126; Casabo i Bernad, J A (1994) "Resultats de la segona campanya d'excavacions d'urgència en la Necropoli Romana del Muntanyar (Xabia, Marina Alta) in *Xabiya* 7 p 66-75.

<sup>183</sup> cf Casabo i Bernad, J A (1994) op. cit. n. 182 p 73.

<sup>184</sup> cf Bolufer i Marques, J (1986) op. cit. n. 182 p 116-117.

<sup>185</sup> cf Reynolds, P (1993) op. cit. n. 24 p 47.

<sup>186</sup> cf Reynolds, P (1993) op. cit. n. 24 p 48.

<sup>187</sup> cf Reynolds, P (1993) op. cit. n. 24 p 54. The form of the burials recall those dated to the Fourth Century AD at El Albir, and those of the Fifth Century AD at Casa Colorá (Elda) and Tossal de Manises.

<sup>188</sup> cf Reynolds, P (1993) op. cit. n. 24 p 55-56.

<sup>189</sup> cf Reynolds, P (1993) op. cit. n. 24 p 86-87.

<sup>190</sup> cf Martin, G and Serres, Ma D (1970) op. cit. n. 24 p 91-92.

The presence of such necropoleis clearly indicates that a substantial population was located in relation to the fisheries even though, as yet, no evidence of dwellings in the immediate vicinity has been found, but does this support the theory that a migrant work-force was employed? The apparent relationship between *villae* and fisheries indicates that the exploitation of marine resources was included in the agricultural activities of the villa; one notes that Pellicer excavated quantities of agricultural implements from the villa at Calpe.<sup>191</sup> As such the operation of the fishery will have operated primarily during fallow months in the wider agricultural calendar, for which the exploitation of the tunny will have been ideal. It seems reasonable to assume, therefore, that labourers would be brought from other activities to operate the fishery during the late summer-early autumn fishing season. Such was the scale of manpower required by the tunny catch, however, that demand would have outstripped the available resources necessitating the use of a migrant work force skilled in the processing of the catch. Such an hypothesis is not inherently unreasonable and is still employed today; however, should such be the case then one would expect the abandonment of the fishery to be matched by that of the necropolis. As we have noted above, the necropolis at Rosas only develops after the abandonment of the fishery, whilst the burials at Muntañar date between the First and Seventh Centuries AD, the fishery itself being only securely attested as operating up to the Third Century AD.<sup>192</sup> It would appear that by this point the population was sufficiently well established to remain after the cessation of the fish processing and at a number of sites we see the establishment of further industrial processes in place of that of the saltery. Thus, for example we see at Troía, the installation of a bread oven overlying parts of the earlier factory<sup>193</sup>, whilst the factory at Benalúa seems to have been given over to the manufacture of glass in the Sixth Century.<sup>194</sup> Occupation seems also to have continued at Punta de l'Arenal although there is no evidence of large scale settlement.<sup>195</sup> Such established populations would point to the existence of *vici* in the immediate vicinity of fisheries, the existence of such being satisfied by the demands created by the salting

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<sup>191</sup> cf Gorges, J G (1979) op. cit. n. 170 p 181.

<sup>192</sup> cf Martin, G and Serres, Ma D (1970) op. cit. n. 24.

<sup>193</sup> cf Etienne, R, Makaroun, Y and Mayet, F (1994) op. cit. n. 93.

<sup>194</sup> cf Reynolds, P (1993) op. cit. n. 24 p 54.

<sup>195</sup> cf Martin, G and Serres, Ma D (1970) op. cit. n. 24.

installations. A corollary of the belief in the use of migrant labour is that the fisheries will have only been fully operational during those months in which the tunny is available. As we have seen at the beginning of this chapter, considerable use was made of other types of marine animals in salteries, and as we shall show later the manufacture of purple dye seems also to have been widely employed with evidence of molluscs turning up in increasing quantities in the fisheries of the Iberian Peninsula.<sup>196</sup> It is the supposition of the writer, therefore, that fisheries could operate through much of the year and on a sufficient scale to maintain a dependent population in the immediate hinterland. The frequency of relatively substantial *villae* along the coastline will have provided a pool of manpower from which the fisheries will have been able to draw at times of abundance.

With the existence, therefore, of substantial rural/semi-urban production the fisheries of the east coast will have operated on a sufficient scale to maintain the dependent communities thereof. Further indication of their importance within the local economy can be adjudged from the use of non-amphora vessels in the local movement of fish sauces. Such are relatively widespread in the immediate hinterlands of the fisheries - much of the evidence for them coming from the associated necropoleis and it would appear that such local exchange played an important part of the operation of the fishing industry.

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<sup>196</sup> The reader is referred to the appendix for a fuller discussion of this issue, suffice it to briefly mention as examples the presence of murex shells at Guardias Viejas, Almería and Torre Garcia, cf Martínez Maganto, J (1994) "El litoral del SE peninsular en época romana. Algunas cuestiones en torno a su explotación económica y comercial" in *Gerion* 12 p 211.

## THE COMMERCE OF FISH SAUCE

### 1. THE ARCHAEOLOGICAL EVIDENCE - AMPHORAE

Any discussion of commerce in the ancient world must concentrate upon the archaeological evidence of such activities - the chief indicator of this being pottery. Little or no trace remains within the archaeological record of the shipment of perishable commodities, however, such goods were often transported with smaller quantities of more identifiable pottery; often higher quality fine table wares particularly *Terra Sigillata* and North African Red Slip and other such wares during the late Imperial period<sup>1</sup>; thus providing an index of commercial interaction across the Mediterranean. More important, however, as direct evidence for the movement of perishable goods, are the finds of the vessels used to carry these items, namely amphorae. These containers were used in the shipment of liquid and other commodities (particularly wine, olive oil and fish sauces) throughout the Mediterranean and are widely found on shipwreck sites giving us a valuable indication as to the existence and operation of trade routes. They play a central role, therefore, in any understanding of exchange - not only through the vessels themselves, but through epigraphic and scientific approaches as to the definition of their origin and contents (in particular through stamps and *tituli picti*).

Although the general role of amphorae is widely agreed upon, a precise definition is more difficult to come by. Peacock and Williams, following Virginia Grace, have chosen to characterise an amphora as a vessel with a narrow corkable mouth surmounting two parallel handles located upon the upper face of an ovoid or spherical body that terminates in a pointed base which facilitates both the emptying and stacking of the vessel.<sup>2</sup> As they have pointed out, however, such a definition ignores various flat-bottomed forms that appear in both Southern France and Spain<sup>3</sup> as well as various

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<sup>1</sup> On the role of pottery in the ancient economy, cf Peacock, D P S (1982) Pottery in the Roman World: an ethnoarchaeological approach (London), cf also Greene, K (1986) The Archaeology of the Roman Economy (London).

<sup>2</sup> cf Peacock, D P S and Williams, D F (1986) Amphorae and the Roman Economy (London ) p. 5, Grace. V (1961) Amphorae and the Ancient Wine Trade (Princeton) p. 3-4.

<sup>3</sup> Principally Dr 28, Palestinian and 'bag-shaped' vessels and Gauloise forms - one might also note the possible exclusion under these criteria of Baetican Dr 20 oil amphorae.

types of flagons and smaller vessels that appear to have played an important role in the movement of goods. For the purposes of this study, therefore, we shall consider two categories of vessel: the first consists of the two handled vessels that were used in the bulk transport of commodities, often though not exclusively liquid, over long distances: a category which thus includes both pointed and flat-bottomed ‘amphorae’, but which also includes *Dolia* which appear to have generally been more static in function.<sup>4</sup> Within this admittedly rather open definition, there occur a wide variety of typological variants, several of which we shall discuss shortly. The second category which we shall discuss seems to have been more localised in use, taking the form of flagons and vessels used in the production of the commodity and in its exchange within the immediate area<sup>5</sup>. The identification of such vessels is extremely problematic, there being little or no evidence as to their contents<sup>6</sup> - only by comparison and the study of the distribution of particular types of coarse ware vessel can we posit some tentative suggestions as to future areas of research. Some resolution of the use of these vessels is, however, a necessity as only with their identification can we hazard any theories as to the relative importance of local and long distance exchange, a question without which any discussion of ancient trade and production must remain somewhat superficial. Notice must also be taken of the location and context within which both categories of vessel were found, for without an understanding of the deposition the relative importance of producing regions can be greatly distorted - a problem that particularly besets distribution maps of amphorae; an omission that we hope will be rectified in the coming chapter.

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<sup>4</sup> Though it should be noted that these vessels seem also to have been shipped on occasion turning up on a number of shipwrecks eg. Ladispoli A cf Parker, A J (1992) Ancient Shipwrecks of the Mediterranean and the Roman Provinces BAR Int. Ser. 580 (Oxford) p. 233.

<sup>5</sup> Again this seems merely to have been the norm rather than the rule - one should recall the appearance of a unique pair of Pompeian form VI *urcei* used in the movement of fish sauce in the town of Pompeii in the early-mid C1st AD, at Fos-sur-Mer bearing the *titulus pictus* of the Pompeian fish sauce merchant A. Umbricius Scaurus, cf Curtis, R I (1991) Garum and Salsamenta: Production and Commerce in Materia Medica (Leiden) p. 79, on Umbricius Scaurus more fully, cf Curtis, R I (1984) “A Personalized Floor Mosaic from Pompeii” in AJA 88 p 557-566; Curtis, R I (1988) “A. Umbricius Scaurus of Pompeii” in Curtis, R I (ed) Studia Pompeiana et Classica in honor of Wilhelmina F. Jashemski 1 p 19-50.

<sup>6</sup> A number of vessels have been found in the form of strainers which suggests a use in the production of fish sauce, whilst Pompeian form VI *urcei* bear *tituli picti* recording their contents as a variety of types of fish sauce but as yet these seem to be without parallel.

The origins of amphorology lie in the pioneering work of Heinrich Dressel upon the amphorae from the Castro Pretorio in Rome.<sup>7</sup> In order to provide a chronological illustration of the different types of vessel that he encountered, Dressel tabulated their individual characteristics.<sup>8</sup> Such was the reliability of his observations that his table has formed the basis of all later work. The limits of Dressel's own objectives and the range of amphorae utilised in his study<sup>9</sup>, have meant that there is little recognition of late Imperial amphora types whilst increased studies, particularly since the development of marine archaeology, have led to the recognition of wider areas of production and of typological variations beyond those recognised by Dressel. As a consequence, later scholars have attempted to extend Dressel's classification both in chronological terms and to incorporate the regional variations of his forms that are known to have been produced particularly in the Spanish and North African provinces. Recent years have seen the recognition of earlier forms of amphora production<sup>10</sup>, as well as typologies of later forms, the most important being the work of Simon Keay on the evidence of deposits in Cataluña and that done by the British Excavations in Carthage.<sup>11</sup> Regional production has been recognised over much of the Western Mediterranean and from the excavations of the Athenian Agora in the East.<sup>12</sup> As a consequence many different typological classifications have been proposed to account for the increasing complexity of amphora studies.<sup>13</sup> However, none of these has entirely superseded Dressel's classification and for the purposes of this research we shall retain the tabulation of Dressel with the additions of Mañá and Almagro, referring to others only as the occasion demands.

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<sup>7</sup> cf Dressel, H (1879) "Di un grande deposito di anfore rinvenuto nel nuovo quartiere del Castro Pretorio" in Bulletino della commissione archeologica comunale di Roma 7 p 36-112, 143-195.

<sup>8</sup> Dressel, H (1899) Corpus Inscriptionum Latinarum 15.1 (Berlin).

<sup>9</sup> The deposit from Castro Pretorio which formed the bulk of Dressel's sample dates to the mid First Century AD.

<sup>10</sup> Punic amphora production has been classified by J. Mañá (1951) "Sobre tipología de ánforas punicas" in Cronica de VI Congreso Arqueologica de Sudeste, Alcoy 1950 p. 203-210. I regret that at the time of writing I have been unable to consult this source directly. For Punic amphora production, cf chapter 2.

<sup>11</sup> cf Late Roman Amphorae in the Western Mediterranean. A typology and economic study: the Catalan evidence BAR Int. Ser. 196 (i & ii) (Oxford); Fulford, M G and Peacock, D P S (1984) The Avenue du Président Habib Bourguiba, Salammbó: the pottery and other ceramic evidence Excavations at Carthage, the British Mission vol. 1.2 (Sheffield).

<sup>12</sup> The results of the latter research remains unpublished.

Despite the problems involved - both as a cause and a consequence of the variations in classification - some correlation between the shape, chronology, contents and origin of the vessel seems to exist. Particular regions seem to have specialised in the production of specific amphora forms for particular commodities, thus, for example, globular Dr 20 seem to have been used for the transport of olive oil from the region of the Guadalquivir valley between Hispalis, Astigi and Corduba from the early First to late Third Centuries AD - a provenance and contents that seem well assured on the basis of potters' stamps and *tituli picti*<sup>14</sup>, however, such certainty is lacking elsewhere and although in several cases, particularly the association of Dr 1 and Dr 2-4 with wine and Dr 7-11 with fish sauce, we can speak of a general association between form and contents, for most we have little more than supposition and there seems to have been considerable reuse and alternative use of vessels more regularly associated with other contents. Beyond these very uncertain typological guidelines any valid comprehension of the relative scale of provincial exports must be based on a quantified record of amphora deposits that as yet are not widely available.<sup>15</sup> Recent advances in fabric analysis have greatly facilitated the comprehension of the provenance of amphorae, whilst chromatography may yield further results in the analysis of contents although this approach is still somewhat experimental.<sup>16</sup> For the moment, therefore, much effort is centred upon the interpretation of epigraphic evidence as to the origins and contents of vessels.

Many amphorae bear stamped names on the handle or base of the vessel - we shall discuss these more fully later in the chapter, suffice it to say that these are

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<sup>13</sup> This is perhaps best seen in the typology recently proposed by Peacock and Williams (1986) *op. cit.* n. 2.

<sup>14</sup> The Baetican oil industry and the use of Dr 20 amphorae are well researched topics in their own right and cannot be discussed here, cf Ponisch, M (1988) *Aceite de Oliva y Salazones de Pescado* (Madrid) p. 17-24; Ponsich, M (1974, 1979) *Implantacion Rurale antique sur le Bas - Guadalquivir* 2 volumes, Casa de Velázquez (Madrid); Blázquez Martínez, J M (1992) "The latest work on the export of Baetican Olive Oil to Rome and the Army" in *Greece & Rome* 39.2 p. 173-188; Remesal Rodríguez, J (1977) "Economía oleícola bética: nuevas formas de análisis" in *AEA* 1977-8 p. 87-142. The fullest deposit of Baetican Dr 20 amphorae is Monte Testaccio, cf Blázquez Martínez, J M, Remesal Rodríguez, J and Rodríguez Almeida, R (1994) *Excavaciones Arqueológicas en el Monte Testaccio (Roma). Memoriá Campaña 1989* (Madrid).

<sup>15</sup> Despite the early origins of amphorology it is only comparatively recently that they have begun to be considered scientifically within the archaeological record.

<sup>16</sup> cf Rothschild-Boros, M C (1981) "The determination of amphora contents" in Barker, G and Hodges, R (eds) *Archaeology and Italian Society* BAR Int. Ser. 102 (Oxford) p. 79-89.

associated either with the potter, the producer of the contents or the *negotiator* responsible for the provision of the amphora. On a number of occasions it is possible to relate such a stamp with a particular person, such as the consul of 14 BC, Cn. Cornelius Lentulus Augur who seems to have been involved in the the shipment of wine produced on his estates in Laetania.<sup>17</sup> More usually such an association is impossible and recourse has to be made to concentrations in the distribution of particular stamps as an indicator of their point of origin, particularly important in this regard is the identification of stamps in relation to kiln sites with the resulting bias in favour of regions that have undergone intensive archaeological survey. In areas suited to such preservation, painted inscriptions (*tituli picti*) have been found on the shoulders or necks of amphora which seem to have been inscribed by customs officials during the shipment of the vessel and which record some or all of the following information - the empty and full weight of the vessel, the name of the *navicularius* (shipper), the location, date and officials responsible for the inscription as well as the estate from which it originated, the location of the vessel within the cargo and its contents.<sup>18</sup> Although these inscriptions are of great importance to the interpretation of ancient amphora, their degree of incidence is poor and they are largely absent from fish sauce amphorae, although they remain useful, particularly in regard to the contents of the vessel. Occasionally stamps have been found on the stoppers of amphorae and to record people other than those recorded on stamps elsewhere on the vessel. It is possible that this recalls the *negotiator* responsible for the bottling and shipment of the vessel<sup>19</sup>, however, these remain rare and to my knowledge unattested within the the area with which this thesis is concerned.

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<sup>17</sup> cf Gianfrotta, P A (1982) "Lentulo Augure e la anfore Laietane" in *Tituli* 4 p. 475-9. On the Fourth Century Senator, Barbarus Probianus, cf Zevi, F (1966) "Appunti sulle anfore Romane: I La tavola tipologica del Dressel" in *Archaeologia Classica* 18 p. 226-7, 247. On Senatorial involvement in commerce, cf D'Arms, J H (1981) *Commerce and Social Standing in Ancient Rome* (Harvard).

<sup>18</sup> cf Peacock and Williams (1986) op. cit. n. 2 p 13-4. Such a degree of detail is attested only on Baetican Dr 20 amphora, elsewhere the formulae seem to have been less complex and to have served as advertisements for the contents of the vessel, cf Curtis, R I (1984) "Product identification and advertising on Roman commercial amphorae" in *Ancient Society* 15- 17 p. 209-228; cf also Curtis, R I (1988) op. cit. n. 5.

<sup>19</sup> cf Paterson, J (1982) "Salvation from the Sea: amphora and trade in the Roman West" in *JRS* 72 p. 146-157.

Despite the difficulties involved in the use of amphora, some attempt will now be made to look at the production of amphorae within the coastal regions of Hispania Tarraconensis, their use in the exchange of fish sauce, the relative importance of local and long distance exchange through the incidence of the two vessel forms outlined above, and finally to posit some albeit tentative conclusions as to the economic background of the people involved.

In 1960 R. Pascual Guash published the first evidence for amphora production within Tarraconensis with the identification of a form (subsequently labelled Pascual 1) copying Dr 1 wine amphorae produced in Italy during the First Century BC (fig. 21.1-2).<sup>20</sup> The form seems to have carried wine<sup>21</sup> produced in Laietania primarily during the Augustan period and its production is attested at a number of sites within the hinterland of Tarraco, Barcino, the Maresme and Empord $\ddot{a}$  in North-Eastern Catalunya and at a number of kilns in Southern France dated from the late First Century BC to the Second Century AD. The vessels are widely found across the North-Western Provinces: although attested within Carthage, Rome and the Balearic Islands, the concentration of vessels points to the Narbonne-Bordeaux and Rhone as the principal trade routes thence running North to Britain and the Rhine frontier with particular concentrations at Vielle-Toulouse and Quimper (Cape Finistère) (fig. 22).<sup>22</sup> It seems reasonable to suppose, therefore, that Laietanian wine was included within the *annona militaris* during the reign of Augustus, whilst their distribution in Britain at that date is concentrated in the southern coastal stretches of Hampshire and the Isle of Wight. This distribution follows those established by the earlier First Century BC trade in Italic Dr 1 amphora and the shift between the two reflects the apparent decline in the Italian wine industry during the late First Century BC.<sup>23</sup>

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<sup>20</sup> Pascual Guash, R (1960) "Centros de producción y difusión geográfica de un tipo de ánfora" in *Actas del VII Congreso Nacional de Arqueología* (Zaragoza) p. 334-345.

<sup>21</sup> Remains of wine have been found in this form from the wreck site of Los Ullastres, Gerona. cf Foerster, F (1974) "Spain. Sa Tuna and Los Ullastres (Gerona)" in *IJNA* 3.

<sup>22</sup> On the distribution of Pascual 1 amphorae, cf Mir $\ddot{u}$  i Canals, J (1988) *La Producción de ánforas Romanas en Catalunya: un estudio sobre el comercio de vino de la Tarraconense* BAR Int. Ser. 473 (Oxford) p. 123-144.

<sup>23</sup> For the distribution of Dr 1 amphora cf Fitzpatrick, A (1985) "The distribution of Dressel 1 amphorae in North-Western Europe" in *OJA* 4 p 305-321.

Further amphora production was identified in 1971 with Tchernia's recognition of Dr 2-4 amphorae production at a number of sites within coastal Cataluña (fig. 21.3-4).<sup>24</sup> This form is particularly widespread across the Western Mediterranean, having been produced in Italy (Campania, Latium and Etruria)<sup>25</sup>, Tarraconensis (Cataluña) and Baetica<sup>26</sup>, S. France<sup>27</sup> and possibly within Britain.<sup>28</sup> The form first appears in the late First Century BC/early First Century AD and remains in use into the Second Century AD, although its distribution becomes more limited from the later First Century AD. It seems to have replaced Pascual 1 amphorae as the principal form used in the shipment of Tarraconensian wine in the early First Century AD being produced at many of the same sites<sup>29</sup> and presumably often by the same people on the basis of the coincidence of stamps between the two - L. VOLTEILUS who also appears upon Tarraconense 1 and Dr 2-4 forms; L. VALERIUS RUFUS attested on Pascual 1 vessels; TIBISI on Pascual 1, Dr 2-4, and Dr 7-11 forms; MAES CELS attested on Oberaden 74 amphorae.<sup>30</sup> *Tituli picti* record the transport within these vessels of Lauronensian wine, which despite a possible origin within Italy has now been associated with the region of Barcelona in North-Eastern Cataluña.<sup>31</sup> Unlike the earlier patterns of Pascual 1 vessels, production of Dr 2-4 seems to have centred upon private exchange and the supply of the *annona* with finds being centred upon the Straits of Bonifacio and the south coast of France following the routes linking Spain to central Italy and confirmed by the concentration of this form at Settefinestre, Ostia and Rome, with a more isolated deposit at Carthage (fig. 23).<sup>32</sup> The form seems to have represented the peak of

<sup>24</sup> cf Tchernia, A (1971) "Les Amphores vinaires de Tarraconaise et leur exportation au debut de l'Empire" in AEA 44 p 38-85.

<sup>25</sup> cf Hesnard, A (1977) "Note sur un atelier d'amphores Dr 1 et Dr 2-4 pres de Terracine" in MEFRA 89 p 157-168.

<sup>26</sup> cf Tchernia, A (1971) op. cit. n. 24; Tchernia, A and Zevi, F (1972) "Amphores vinaires de Campanie et de Tarraconaise a Ostie. Recherche sur les Amphores Romaines" in MEFRA p 35-67.

<sup>27</sup> cf Zevi, F (1966) op. cit. n. 17.

<sup>28</sup> Castle, S A (1978) "Amphora from Brockley Hill 1975" in Britannia 9 p 383-392.

<sup>29</sup> cf Pascual Guash, R (1977) "Las anforas de la Layetania" in Methodes Classiques et Methodes Formelles dans l'etude des amphores p 47-96; Miró i Canals, J (1988) op. cit. n. 22.

<sup>30</sup> The stamps attested upon amphora will be discussed in more detail shortly, for a basic introduction to those of Pascual 1 and Dr 2-4 vessels, cf Pascual Guash, R (1977) op. cit. n. 29; Miró i Canals, J (1988) op. cit. n. 22.

<sup>31</sup> From Castro Pretorio (Rome), cf. CIL xv.4577: LAUR(onense) VET(us); CIL xv.4578: LAUR / IIII / ...; CIL xv.4579: VETUS IIII / LAUR / LAY; Ostia, LAUR / ACET / LAG, cf Sealey, P R (1985) Amphorae from the 1970 excavations at Colchester Sheepen BAR Ser. 142 (Oxford) p 45.

<sup>32</sup> cf Miró i Canals, J (1988) op. cit. n. 22 p 144-164.

Hispanic wine exports being a lighter and more capacious vessel than the earlier Pascual 1 with a wider distribution in private hands and the opening up of the market led to the appearance of Dr 2-4 production beyond the traditional confines of earlier Tarraconensian manufacture to the south of Cataluña.<sup>33</sup> These two forms seem to have been the most widespread products of the region representing the importance of Catalan wine production during the First Century AD. There are, however, a number of other forms produced within the coastal hinterland. Unlike Pascual 1 and Dr 2-4 vessels which were primarily, although by no means exclusively, used in the movement of wine, these forms are of a more uncertain function - we shall discuss Dr 7-11 and its use for fish sauce shortly, but it is worth mentioning various of these forms at this point as they have tended to be associated with the prevalent commodity of the region, namely wine.

Dr 28 is a widely distributed, flat-bottomed form with little homogeneity in shape leading a number of commentators to view one of its derivatives, Oberaden 74, as a form in its own right (**fig. 21.5**). The form appears to have been derived from Republican precedents and to have been produced through the First Century AD to early Second Century AD. As yet little is known of the origin of the form whose production may well have centred upon the Eastern litoral of Tarraconensis with a number of kilns located within Cataluña and further south at Oliva.<sup>34</sup> Kilns are also

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<sup>33</sup> Orleyl, Vall d'Uxo, Castellón - cf. Alcina Franch, J (1946) "Descubrimiento de un horno romano en Vall de Uxo" in Cronica del II Congreso Arqueologico del Sudeste Espanol (Albacete) p 329-333; Grau Vell de Sagunto - cf. Aranegui Gasco, C and Mantilla Collantes, A (1987) "La Produccion de anforas Dr 2-4 de Sagunto" in El Vi a l'Antiguitat: Economia, Produccio i Comerc al Mediterrani Occidental Actes I Colloqui d'Arqueologia Romana (Museo de Badalona) Monografies Badalonines n. 9 p 100-104; Aranegui Gasco, C (1981) "La Produccion de Anforas Romanas en el Pais Valenciano: estado de la cuestion" in APL 16 p 529-538; Oliva - cf. Enguix, R and Aranegui Gasco, A (1977) El taller de las anforas Romanas de Oliva TV del SIP 54 (Valencia); Daimuz, Ondara, Potries - cf. Gisbert Santonja, J A (1987) "La produccio de vi al territori de Dianium durant l'Alt Imperi: el taller d'amphores de la villa Romana de l'Almadrava (Setla - Mirarosa - Mirafior)" in El Vi a l'Antiguitat: Economia, Produccio i Comerc al Mediterrani Occidental Actes I Colloqui d'Arqueologia Romana (Museo de Badalona) Monografies Badalonines n. 9 p 104-118; Jesus Pobre - cf. Gisbert Santonja, J A (1992) "Dues terrisseries Romanas del territorio de Dianium. Els jaciments de Perdigo i de la Teulera de Jesus Pobre (Denia, Alacant)" in III Congres d'Estudis de la Marina Alta (Alicante) p 89-100; Verger - cf. Aranegui Gasco, C and Mantilla Collantes, A (1987) op. cit.; l'Almadrava - cf. Gisbert Santonja, J A (1987) op. cit.; Abascal, J M and Gisbert Santonja, J A (1991) "Numismatica y evidencia arqueologica en el alfar Romano de la Almadrava (Setla - Mirarosa - Mirafior)" in Lucentum 9-10 p 133-160.

<sup>34</sup> cf Aranegui Gasco, C (1981) op. cit. n. 33; Enguix, R and Aranegui Gasco, A (1977) op. cit. n. 33.

known in France at Velaux and Corneilham.<sup>35</sup> It has been suggested that those found in the Port Vendres II wreck were of a Baetican origin<sup>36</sup>, although this hypothesis has subsequently been challenged.<sup>37</sup> Although relatively scarce the distribution of the Tarraconensian vessels seems to have centred upon the Narbonne-Bordeaux and Rhone-Rhine routes and to have primarily been in the hands of three producers, Sextus Domitius from Tivissa (L'Aumedina), Philodamus from El Sot del Camp (Sant Vincenç de Montalt) and C. Mussidius Nepos (fig. 24).<sup>38</sup> Although traditionally associated with the movement of fish sauce, a use in the transport of wine is also possible.<sup>39</sup> Those found at Port Vendres II were lined with resin which precludes their use with olive oil<sup>40</sup>, whilst their production within Catalunya and in conjunction with wine amphora forms may support this hypothesis. The coincidence of stamps (MAES CELS) with wine amphorae might also indicate a use in the transport of wine although a correlation between stamps and contents cannot be shown to have existed - it is equally probable that MAES CELS produced Pascual 1 and Dr 28/Oberaden 74 vessels for different commodities, perhaps wine and fish sauce respectively. Sealey in his study of the amphorae from Colchester Sheepen has suggested a use in the transport of wine, at least for those examples produced in Southern France on the basis of a comparison with the flat-bottomed Pelichet 47 wine amphorae which were produced in the same region.<sup>41</sup>

In this regard it is also worth noting the production of similar flat-bottomed Dr 30/Pelichet 47 forms in a number of locations in Eastern Tarraconensis (fig. 21.6). This

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<sup>35</sup> cf Beltrán Lloris, M (1987) "El Comercio del vino antiguo en el Valle del Ebro" in El Vi a l'Antiguitat: Economia, Produccio i Comerc al Mediterrani Occidental Actes I Colloqui d'Arqueologia Romana (Museo de Badalona) Monografies Badalonines n. 9 p 59.

<sup>36</sup> Colls, D et alii (1977).

<sup>37</sup> cf Parker, A J and Price, J (1981) "Spanish exports of the Claudian period: the significance of the Port Vendres II wreck reconsidered" in IJNA 10.3 p 221-228. For a Gallic example, cf Beltrán Lloris, M (1987) op. cit. n. 35 p 59.

<sup>38</sup> cf Miró i Canals, J (1988) op. cit. n. 22 p 170-177.

<sup>39</sup> cf Miró i Canals, J (1981) "Les marques <C.Mussidi Nepotis> i <Philodamus> i la produccio d'amphores Dr 28 i Dr 7-11 a Catalunya" in Pyrenae 17-18 p 335-342.

<sup>40</sup> Colls, D et alii (1977) op. cit. n. 36 p 45.

<sup>41</sup> cf Sealey, P R (1985) op. cit. n. 31 p 97. Ribera Lacomba, A and Fernandez Izquierdo, A (1985) "Prospecciones Arqueologicas submarinas en la zona del Saler (Valencia)" in VI CIAS, Cartagena 1982 (Cartagena) p 88 state that *tituli picti* record a wider range of contents for the form: molluscs, honey and olives - in support of which they cite Zevi, F (1966). I have, however, been unable to date to identify the source of this citation.

is a poorly classified form with a degree of typological confusion between the two forms already noted and the later Almagro 51 amphora, although those found within *Tarraconensis* would appear to be Pelichet 47 on the basis of the diameter of the base of the vessel.<sup>42</sup> Pelichet 47 were primarily produced in Southern France, particularly in the area of Bouches-du-Rhone, as well as at a number of sites further north and possibly also extending to the south along the Spanish coast with production being attested at Santa Maria de les Feixes and Llafranc (Cataluña) and within the environs of Denia (Valencia): at La Teulera, Jesus Pobre and L'Almadraba (Mirafior).<sup>43</sup> Those found at Grau Vell de Sagunto may have originated from the kiln at Llafranc.<sup>44</sup> Dr 30 amphora, however, seem to have been of a North African origin, an example of the form found at Punta de l'Arenal bears a stamp which indicates its origin as being the city of Tubusuctu (modern Tiklat) in Mauretania Caesariensis.<sup>45</sup>

The identification of those vessels produced in *Tarraconensis* as Pelichet 47 is further supported on chronological grounds. Those at Llafranc were produced in conjunction with Pascual 1, Dr 2-4 and Dr 7-11 amphorae which would suggest a date in the First Century AD.<sup>46</sup> At L'Almadraba the production of Dr 30/Pelichet 47 vessels is dated to the second and third phases of occupation on the site which are dated from the beginning of the Second Century AD and continuing through to the third quarter of

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<sup>42</sup> The amphorae themselves were classified as Dr 30 by the excavators, cf Gisbert Santonja, J A (1992) op. cit. n. 33; Aranegui Gasco, C and Gisbert Santonja, J A (1992) "Les amphores a fond plat de la Peninsule Iberique" in Laubenheimer, F (ed.) *Les Amphores en Gaule* p 101-109.

<sup>43</sup> cf Gisbert Santonja, J A (1987) op. cit. n. 33; cf also Gisbert Santonja, J A (1992) op. cit. n. 33.

<sup>44</sup> cf Mantilla Collantes, A (1987) "Marcas y anforas romanas encontradas en Saguntum" in *Saguntum* 21 p 397.

<sup>45</sup> cf Bolufer i Marques, J (1987) "Una marca d'Amfora Maurítana de la Punta de l'Arenal (Xabia, Alacant)" in *El Vi a l'Antiguitat: Economia, Produccio i Comerç al Mediterrani Occidental* Actes I Colloqui d'Arqueologia Romana (Museo de Badalona) Monografies Badalonines n. 9 p 443-445. Gisbert has noted the presence of this form off the coast of L'Almadrava and Denia, cf Gisbert Santonja, J A (1987) op. cit. n. 33 p 112; Gisbert Santonja, J A (1985) "Hallazgos Arqueologicos submarinos en la costa de Denia. Las anforas de cronologia Romana Republicana" in *VI CIAS* Cartagena 1982 (Cartagena); Fernandez Izquierdo, A and Gisbert Santonja, J A (1992) "Investigaciones Arqueologicas Subacuaticas en las costas de Denia 1985-1989" in *III Congreso d'Estudis de la Marina Alta* (Alicante) p 79-88; which he contrasts with its absence from the Second-Third Century AD levels at l'Hort de Morand and at villa sites within the vicinity of Denia. This he believes might suggest that the form was intended for the export of wine or other products and not its local consumption. On the finds from El Saler, cf Fernandez Izquierdo, A (1984) *Las Anforas Romanas de Valentia y de su entorno marítimo* (Valencia) p 75, 83, 92; Martin, G and Saludes, J (1966) "Hallazgos arqueologicos submarinas en la zona de El Saler (Valencia) in *APL* 11 p 155-169.

<sup>46</sup> cf Barti Catala, A and Plana Mallart, R (1993) "La terriseria d'epoca romana de Llafranc (Palafrugel, Girona)" in *Cypsela* 10 p 87-99.

the Third Century AD, ending in the period 275-285 AD.<sup>47</sup> The second phase of occupation on the site seems to have been that of the most economic activity seeing the construction of the principal workshops (i, ii, iii and iv). Amphora production during this period accounts for 80 % of the total ceramic out-put of the kilns and consists of Dr 2-4 and Dr 30/Pelichet 47 forms. The third phase, after a possible period of abandonment and/or economic recession, sees the restoration and centralisation of the existing workshops with the continued production. As to the termination of the pottery, the last attested coin series of the third phase is of Claudius II (13 examples) after which there is only a unique coin of Florian (276).<sup>48</sup> A fourth phase of occupation appears to resume late in the reign of Constantine I (c 330 AD) but seems to have taken the form of residential rather than industrial use. At La Teulera and Jesus Pobre Dr 30/Pelichet 47 are produced alongside Dr 2-4, whilst two examples of Dr 20/26 attested on the site may also be of a local origin. Chronologically the site may have been in use from the Flavian to Antonine periods.<sup>49</sup> Production of the form, therefore, seems to centre in the Second Century AD continuing from the mid-late First Century AD to the mid Third Century AD, a date that accords well with that attested for Pelichet 47 elsewhere.<sup>50</sup> Dr 30 amphora on the other hand have been found at Ostia in levels dated to the Third Century AD, although their production may date back to the late Second Century AD and continues into the Fourth Century AD.<sup>51</sup> As regards to contents, those vessels from Southern France are conventionally associated with the wine trade and the correlation of Dr 30/Pelichet 47 production with that of wine amphorae within Tarraconensis, particularly of Dr 2-4 may indicate a similar function. One should perhaps note the appearance of the stamp CAL.CIS.FI on Dr 30/Pelichet 47 amphorae from L'Almadraba, possibly to be related with that of PL.CIS on Dr 2-4

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<sup>47</sup> cf Abascal, J M and Gisbert Santonja, J A (1991) op. cit. n. 33 p 136; Gisbert Santonja, J A (1987) op. cit. n. 33.

<sup>48</sup> cf Abascal, J M and Gisbert Santonja, J A (1991) op. cit. n. 33 n. 42-54 - Claudius II, n. 56 - Florian.

<sup>49</sup> cf Gisbert Santonja, J A (1992) op. cit. n. 33.

<sup>50</sup> cf Peacock, D P S and Williams, D F (1986) op. cit. n. 2 p 142-3.

<sup>51</sup> cf Bolufer i Marques, J (1987) op. cit. n. 45 p 445.

from the same site.<sup>52</sup> Those from North Africa have been linked with the trade of locally produced oil but there are little grounds for either supporting or refuting this.<sup>53</sup>

A further form which seems to have been widely produced in Southern Valencia in the hinterland of Denia (ancient Dianium) is Dr 26 (**fig. 25.1**). This globular vessel is closely related typologically to Dr 25 from which Baetican Dr 20 oil amphorae are evolved.<sup>54</sup> On the basis of this relationship they have been conventionally linked with the shipment of oil, which might explain their absence from kilns to the north.<sup>55</sup> They appear during the first phase of occupation at L'Almadraba dated to the second half of the First Century AD<sup>56</sup>, a date that is supported by finds elsewhere.<sup>57</sup>

Recent years have seen the identification of locally produced forms predating the production of Pascual 1. The earliest production seems to have centred upon a Laietanian copy of Dr 1 (Dr 1 Layetana) presumably used in the shipment of wine (**fig. 25.2**). Thus far it has only been identified within Cataluña and seems to have been produced at a number of sites within the Maresme.<sup>58</sup> The earliest examples recall earlier Iberian fired pottery and date to c80-70 BC whilst later vessels are closer to Pascual 1 amphorae in fabric, dating to 65-50 BC before the form seems to have been replaced by Tarraconense 1 and Pascual 1 forms. As such they represent the earliest stages of the exportation of wine from Laietania prior to the expansion which takes place under the guise of Tarraconense 1 and Pascual 1 amphorae.

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<sup>52</sup> cf Gisbert Santonja, J A (1987) op. cit. n. 33 p 112.

<sup>53</sup> cf Peacock, D P S and Williams, D F (1986) op. cit. n. 2 p 171-2.

<sup>54</sup> Zevi, F (1966) op. cit. n. 17 rather peculiarly associates this form with Dr 27 amphorae, a connection which I have been unable to discern.

<sup>55</sup> cf Zevi, F (1966) op. cit. n. 17 p 224-5.

<sup>56</sup> cf Abascal, J M and Gisbert Santonja, J A (1991) op. cit. n. 33 p 135.

<sup>57</sup> The deposit at Calle del Mar, Valencia is dated to the mid First Century AD, cf Fernandez Izquierdo, A (1984) op. cit. n. 45 p 30; from Castro Pretorio, Rome dated to the mid - late First Century AD, cf Zevi, F (1966) op. cit. n. 17 p 224; Pompeii; that from Punta de l'Arenal found within zona 2, Habitacion D, estrato II B (Martin, G and Serres, Ma D (1970) La Factoria pesquera de la Punta de l'Arenal y otros restos romanos de Javea (Alicante) TV del SIP 38 (Valencia) plate 31) appears to be of Dr 2-4 rather than Dr 26 as believed by Reynolds (Reynolds, P (1993) Settlement and Pottery in the Vinalopó valley (Alicante, Spain) AD 400-700 BAR Int. Ser. 588 (Oxford) p 85) and so dates to the Third Century AD, cf Martin, G and Serres, Ma D (1970) op. cit. p 76; those examples for the Necropolis de la Boatella, Valencia and Empúries dated to the Third - Fourth Centuries AD are probably residual; cf Fernandez Izquierdo, A (1984) op. cit. n. 45 p 25-6.

<sup>58</sup> cf Miró i Canals, J (1988) op. cit. n. 22 p 60-3: Riera de Sant Simó, Burriac, Mataró, Badalona, Vilassar y Cabrera and Montpalau (Pineda de Mar).

Recent studies of the amphorae from Empúries<sup>59</sup> revealed the presence of a further form of Republican amphora from Tarraconensis, subsequently classified as Tarraconense 1 (fig. 25.3).<sup>60</sup> The form consists of a large ovoid body, a thick and stocky neck and a short diminutive point, in fact one of the problems presented by these vessels is their close relationship to Tarraconensian Dr 10 amphorae. As well as the initial deposit at Empúries the form has been found at a number of sites in the Maresme and seems to have originated in this area.<sup>61</sup> A local origin is supported by the appearance of the stamp Q.Mevius on both Tarraconense 1 and Pascual 1 forms whilst that of L. Voltei(us?) is attested from El Sot del Camp (San Vincenç de Montalt) on Pascual 1 and Dr 2-4 vessels.<sup>62</sup>

Amongst the most problematic are those from the wreck site of Iles Formigues (Palamós).<sup>63</sup> The site was discovered in 1953 and was the subject of two campaigns of excavation undertaken by the CRIS in 1958 and 1981 during the former of which a cargo of Tarraconensian amphorae were identified, being originally ascribed to Dr 10 (fig. 26.2). The form of the body of these vessels matches that of Dr 10 amphorae, however, it is in the formation of the lip that we see the principal variation between Dr 10 and Tarraconense 1. The Dr 10 amphorae produced at Tivissa are typical of the form as a whole possessing an angular lip with a pronounced conical rim. The elliptical profile is divided into three sections, the upper being thickened and overhanging above the convex central section. Such a shape is in marked contrast to that of the Tarraconense 1 vessels excavated from Palamós. A cargo of 30 complete amphorae were identified which, although possessing ovoid bodies in the form of Dr 10 amphora,

<sup>59</sup> cf Nolla i Brufau, J Ma (1974) "Las anforas romanas de Empúries" in *Empúries* 36 p 147-197.

<sup>60</sup> cf Miró i Canals, J (1988) op. cit. n. 22 p 63-9.

<sup>61</sup> cf Nolla i Brufau, J Ma (1987) "Una nova amfora Catalana: La Tarraconense 1" in *El Vi a l'Antiguitat: Economia, Produccio i Comerc al Mediterrani Occidental Actes I Colloqui d'Arqueologia Romana* (Museo de Badalona) Monografies Badalonines n. 9 p 218-9: Empúries, Castell de la Fosca (Palamós), Platja de Fenals (Lloret de Mar), Badalona, Barcelona, Tarragona, Cap de Creus, Punta de les Forques, Agen, Illes Formigues (Palamós) and in the Baix Llobregat; Miró i Canals, J (1988) op. cit. n. 22 p 210-214: Llavaneres, Cap Béar, Herault, Vielle-Toulouse, Ussubium, Ruscino, Mercadal, Port-la-Nautique, Narbonne, Cayla de Mailhac, Baeterra, Auterive, Sainte-Foy-la-Grande, Cintegabelle, Saint-Jean-le-Vieux, Fos.

<sup>62</sup> cf Miró i Canals, J (1988) op. cit. n. 22 p 213-4.

<sup>63</sup> cf Foerster, F, Pascual Guash, R and Barberá, J (1987) *El Pecio romano de Palamós* CRIS; Vidal, C and Pascual Guash, R (1961) "El pecio de Palamós" in *Actas del III Congreso Internacional de Arqueología Submarina* Barcelona 1961, reprinted in the above p 93-101.

possess little unity in terms of handles, lips or bases - the most important of which in establishing the separation from the preceding type is the form of the lip. Unlike the forms discussed above the vessels from Palamós possess a unified and vertical rim - a characteristic that is found elsewhere and seems to be the greatest aid in defining these closely related forms.<sup>64</sup> Similar vessels to those from Palamós have been found associated with Dr 1 vessels at wrecksites at Spargi, Titan and Illa Pedrosa whilst the site of Palamós is dated to the period 100-50 BC<sup>65</sup>, a date which would make any association with Dr 10 an impossibility. The excavators, however, noted that those vessels stamped L.VOLTEIL appeared to form an homogenous group within the deposit<sup>66</sup> the rim appearing more angular in profile. Although we can, therefore, suggest the identification of a separate form on the basis of the rims recovered, such must be qualified by the wide range of variants that appear in both forms with the likelihood of mis-attribution being a common one.

As regards the contents of the vessel, those from Palamós recall similar Republican vessels from Apulia which were used in the movement of oil<sup>67</sup>, however, they were found to contain resin which precludes such a use. Their similarity to Dr 10 amphorae used in the exchange of fish sauce might imply a similar role, although the form has yet to afford any evidence as to its contents either directly or through *tituli picti*. The conventional interpretation is that the vessels contained wine on the basis of the coincidence in production between Tarraconense 1 and later Tarraconensian Pascual 1 and Dr 2-4 wine amphorae with the appearance of a number of stamps in common alluding to a similar use. The vessel would appear, therefore, to have been one of the earliest produced for use in the exportation of wine from Laetania being attested in the final levels of the Iberian settlement of Castell de la Fosca which is dated on the basis of finds of Arretine ware and Pascual 1 amphorae to the second half of the First

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<sup>64</sup> Although such seems to provide a reliable criteria for definition one should note the closer relationship between Dr 10 and Tarraconense 1 vessels from Empúries, cf Nolla i Brufau, J Ma (1987) op. cit. n. 61 fig. 220, and Llafranc, cf Barti Catala, A and Plana Mallart, R (1993) op. cit. n. 45, cf also Miro i Canals, J (1988) op. cit. n. 22 fig. 30, 3-9.

<sup>65</sup> cf Foerster, F, Pascual Guash, R and Barberá, J (1987) op. cit. n. 63 p 85-6.

<sup>66</sup> cf Foerster, F, Pascual Guash, R and Barberá, J (1987) op. cit. n. 63 p 86-7.

<sup>67</sup> cf Foerster, F, Pascual Guash, R and Barberá, J (1987) op. cit. n. 63 p 85; Baldacci, P (1965) "Alcuni del commerci nei territori cisalpini" in Atti del Centro di Studi e Documentazione sull'Italia Romana 1 (Milano-Varese) p 5.

Century BC, a date paralleled by finds of the form from Empúries and Badalona.<sup>68</sup> Beyond Tarraconensis the form is not widely distributed and must represent the earliest stages in exportation, succeeding the more localised production of Dr 1 Layetana in the First Century BC before being replaced in turn by Pascual 1 amphorae in the early Augustan period. However, the sole evidence for the role of these vessels is the resin lining found within those of Palamós and the question must remain open.

Although the forms discussed thus far primarily pertain to the exportation of wine from Tarraconensis, they should not be overlooked when we consider the shipment of fish sauces. Several forms can be linked with specific products - Dr 20 amphorae shipping oil from Baetica, Dr 1 wine amphorae from Italy and Pascual 1 carrying wine produced in Tarraconensis. But for the rest, ascribed contents seem to have been at best merely a guide as to probable contents and in many cases we cannot take such supposition even that far. Several of the forms more readily associated with wine such as Dr 2-4 seem also to have been used for fish sauces whilst the reverse is equally true. As a consequence, to ascertain fully the contents of amphorae, a detailed analysis both of residues within the fabric and, where they appear, of *tituli picti* is required. Sadly such approaches are only now coming to the fore and such quantified and detailed data is only recorded for a small percentage of the total amphora finds. Until such are more widely available we are forced to retain the potentially erroneous and misleading generalisations based upon the supposed relationship between form and content. This is not to say that a correlation did not exist, rather that it was not as unified as we would perhaps like to believe. Further discussion of this important topic must wait until we turn our attention to the commerce of fish sauce, for the moment, however, we shall turn to the production of a series of forms within Tarraconensis which are more readily associable with the exchange of fish products.

Four principal forms of fish sauce amphorae have been identified: Dr 7-11, Dr 38-39, Dr 12-13 and Dr 14 (subsequently classified as Beltrán I, II, III and IV)<sup>69</sup>, the most widespread within Tarraconensis being Dr 7-11 and Dr 38-39 although the other forms have also been identified upon a number of sites. All these forms date to the early

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<sup>68</sup> cf Nolla i Brufau, J Ma (1987) op. cit. n. 61 p 219.

<sup>69</sup> cf Beltrán Lloris, M (1970) Las Anforas Romanas en España Institucion Fernando el Catolico 502 (Zaragoza). Other fish sauce amphorae include Dr 6, 15, 16-17, 41, and possibly Dr 18, 21-22.

Empire and it is within the later period that we see the appearance of further forms produced within the region - *spatheia* vessels, Almagro 50 and 51 forms.<sup>70</sup> Within the four forms classified by Beltrán one should note the wide range of typological variants which present a number of problems for the archaeologist particularly in their differentiation from closely related forms such as Tarraconense 1 which we discussed earlier. There is little in the way of typological characteristics to identify fish sauce amphorae as a group, therefore, prior to turning our attention to the evidence for the production of these forms we should outline the identifying criteria of shape, fabric and form for the types concerned.

The most important vessels used in the movement of fish sauces seem to have been Dr 7-11 amphorae which were produced over much of the Western Mediterranean in the late First Century BC - First Century AD. This classification of amphorae is amongst the most problematic showing such a wide range of variations that later commentators have gone as far as to reject the validity of their amalgamation<sup>71</sup>, however, considering the lack of typological cohesion and the use of the five constituent forms in the movement of fish sauce we shall retain the widely accepted grouping.

Although grouped by broad typological similarities, Dr 7-11 are further characterised individually, perhaps in recognition of their use for different varieties of fish sauce<sup>72</sup> or in the manner of Dr 1 and Dr 2-4 variants, as a consequence of a wide geographical distribution of production. Generally they are characterised by an ovoid body - perhaps denoting a Punic prototype<sup>73</sup>, a pronounced lip and ridged handles, however, there is little uniformity in terms of the lips and bases of these forms.

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<sup>70</sup> These late vessels shall be discussed in chapter 5.

<sup>71</sup> cf Zevi, F (1966) op. cit. n. 17 p 230.

<sup>72</sup> cf Sealey, P R (1985) op. cit. n. 31 p 80.

<sup>73</sup> cf Gonzalez Serrano, Ma P (1988) "Anforas y salazones" in *Anejos de Gerion* 1 p 298. This is perhaps significant in regard to the recent identification of Punic amphora at Darró, Vilanova i Geltrú, Barcelona, cf López Mullor, A and Fierro Macía (1994) "Un horno con ánforas de tipo púnico-ebusitano hallado en Darró (Vilanova i Geltrú, Barcelona)" in González, A, Cunchillos, J L and Molina, M (eds) *El Mundo Púnico. Historia, Sociedad y Cultura* Cartagena, 17-19 November 1990, Coloquios de Cartagena 1 (Cartagena). Later production at the kiln centred upon Pascual 1 and Dr 7-11 forms, cf Miró i Canals, J (1988) op. cit. n. 22 p 14-15; López Mullor, A, Batista, R and Zucchitello, M (1987) "La producción vitivinícola de la Tarraconense. Algunos ejemplos sintomaticos" in *El Vi a l'Antiguitat: Economia, Produccio i Comerc al Mediterrani Occidental* Actes I Colloqui d'Arqueologia Romana (Museo de Badalona) Monografies Badalonines n. 9 p 319-325; López Mullor,

Although Dressel separated his Dr 7 and 8 forms they are difficult to distinguish. They possess an ovoid body, short neck, a thin or moulded lip and a pronounced point (**fig. 27.1-2**). A variant of this form has been identified within the amphorae excavated from Empúries and classified by Nolla as Dr 8 Ampuritana.<sup>74</sup> These possess a height of up to one metre and a piriform profile. The lip is squat and arched from the neck of the vessel. The diameter is thin with a conical form and high profile. The handles are elliptical in shape, run parallel to the neck and are grooved on the outer face. The base is high, cylindrical, solid and clearly differentiated from the body. On the base is stamped the mark ANTH found only in Empúries which has led to its attribution to a local source although kilns involved in this production have yet to be identified.

Dressel forms 9, 10 and 11 are more readily differentiated possessing a piriform body, bulbous towards a less clearly demarked point (**fig. 27.3-5**).<sup>75</sup> They are bag shaped with a short, wide neck, vertical in profile surmounted by a broad rim. The vessels lack pronounced shoulders and the handles are short and curved in profile. Typologically the curved body of Dr 10 amphorae are closely related to the Tarraconense 1 vessels referred to above.

Within these broad categories of form a number of variants have been noted, particularly in terms of rims and bases, which seem to have begun to become standardised by the Second Century AD (**fig. 28**). The most numerous form attested at Tivissa is characterised by a high, strong lip, at times marked by a fine line along the upper face separated from the lower face by a rounded concave ridge or more often by a sharp line. The second variant is similar to this in the separation of the lip into two faces and in its curvature and height. However, the lip of the group is thinner than that above and in profile the upper face forms a more stylised and less rounded point creating a more hooked profile than in the previous group. In relation to this the lower face forms a thick ring, rounded or triangular in section that clearly delineates the neck

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A and Ferrer, A (1982) "Hallazgos anfóricos en el establecimiento ibérico y romano de Darró, Vilanova i Geltrú (Garraf)" in *Informació Arqueològica* 39 p 82-89. For the production of amphora forms within Eastern Tarraconensis that imitate the prevalent Punic forms, cf chapter 2.

<sup>74</sup> cf Nolla i Brufau, J Ma (1974) op. cit. n. 59 p 191-3.

<sup>75</sup> On the basis of the piriform shape Gonzalez Serrano, Ma P (1988) op. cit. n. 73 p 297 has chosen to associate these vessels with Dr 6, 8, 14 and 15 forms and Pelichet 47.

from the lip. The further lip types are less numerous<sup>76</sup>: the third variant is identified by a finer lip forming a hook in its lower face, with the separation of the neck from the lower face of the lip consisting merely of an angle rather than the more pronounced ring seen in the two more numerous forms. Those of variant four are characterised by a less pronounced lip and simple profile that consists of a gradual curvature from the neck, the join marked only by a slight ridge. The fifth variation consists of a pronounced rounded upper face and a prominent triangular ridge marking the lower face of the lip. Sadly the poor state of preservation of the material recovered from Tivissa means that it is impossible to associate a form with the different categories of lip.

Dr 7-11 production is also attested at the kiln of Llafranc where it is found alongside that of Dr 2-4 and a flat-bottomed form, possibly to be connected with Oberaden 74 vessels. No complete examples have been found but the neck forms conform to variant I from Tivissa.<sup>77</sup>

The lack of typological uniformity is reflected in the diversity of fabrics identified in Dr 7-11 vessels, this being a consequence of their wide geographical distribution. Wide variations are found between the products of different kiln sites as well as within the individual deposits themselves. Even so, the vessels produced within Tarraconensis have produced a number of common characteristics derived from their production from granitic clays and it has been suggested that further variations are the result of firing rather than petrological differences in the clays used.<sup>78</sup> Catalan fabrics are marked by inclusions of mica, quartz and feldspar, generally hard in texture with dark impurities. The most numerous fabric is red in colour with the above inclusions and seems to have originated in the Maresme.<sup>79</sup> However those vessels produced at sites such as Can Tintorer in the Baix Llobregat possess a yellow-beige fabric, again with granitic impurities and softer to the touch than those of the Maresme. Further

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<sup>76</sup> cf Revilla Calvo, V (1993) Produccion ceramica y economia rural en el Bajo Ebro en Epoca Romana: el alfar de l'Aumedina, Tivissa (Tarragona) (Barcelona) p 70-71; cf also Miró i Canals, J (1988) op. cit. n. 22 p 103.

<sup>77</sup>cf Barti Catala, A and Plana Mallart, R (1993) op. cit. n. 45 fig. 6; cf also Revilla Calvo, V (1993) op. cit. n. 76 p 70.

<sup>78</sup> cf Miró i Canals, J (1988) op. cit. n. 22 p 105.

<sup>79</sup> cf Miró i Canals, J (1988) op. cit. n. 22 p 104-107; Pascual Guash, R (1977) op. cit. n. 29; the fullest discussion of Catalan fabrics is to be found in Keay, S J and Jones, L (1982) "Differentiation of Early Imperial amphora production in Hispania Tarraconensis" in Freestone, I, Potter, T and Johns, C Current research in ceramics: Thin Section Studies (London) p 45-61.

sites, however, seem to have produced more individualised fabrics: those of Tivissa are red-yellow in colour, fine in texture with little by way of visible impurities. It is perhaps worth noting at this point the deposit of Dr 7-11 amphorae identified at  $\epsilon$ /Porteria de las Monjas/Condesa de Peralta (Cartagena) - about which more shall be said later - which were believed by the excavators to have fabrics similar to those from Tivissa with inclusions of quartz, mica and feldspar.<sup>80</sup> Those from Llafranc are beige-pink in colour recalling Comas' identification of three fabrics within the deposit at Badalona.<sup>81</sup> As such, therefore, the Dr 7-11 amphorae conform to the typical Tarraconensian fabric identified in Pascual 1 and Dr 2-4 forms produced within the region.<sup>82</sup>

*Tituli Picti* well attest the use of Dr 7-11 amphora as containers for the shipment of fish sauces.<sup>83</sup> Numerous examples identified by Dressel from the Castro Pretorio, Rome record the contents as being *garum*, *muria*, *liquamen* and *hallec*.<sup>84</sup> Although such seem to have been the principal use of these vessels, other contents also appear to have been carried. A Dr 9 amphora from Rome bears the *titulus*: 'Ti. Caesare V cos / Gaditanum'.<sup>85</sup> Although Gades is nowhere noted for its production of wine, the presence of a consular date would point to a content for which a vintage was

<sup>80</sup> cf Martín Camino, M, Ángeles Pérez Bonet, Ma and Roldán Bernal, C (1991) "Contribución del área portuaria de Carthago Nova y su tráfico marítimo en época altoimperial" in *AEA* 64 p 272-283.

<sup>81</sup> cf Comas i Sola, M (1985) *Baetulo: les amfores* (Museo de Badalona) Monografies Badalonines n° 8 p 67-69.

<sup>82</sup> cf Peacock, D P S and Williams, D F (1986) op. cit. n. 2 class 6 p 93-5; Pascual Guash, R (1977) op. cit. n. 29.

<sup>83</sup> cf Zevi, F (1966) op. cit. n. 17 p 242-247; Callender, M H (1965) *Roman Amphora* (London) p 17-18 has, however, argued that no such relationship existed between form and contents.

<sup>84</sup> Curtis, R I (1991) op. cit. n. 5 p 40 has noted that of the 62 inscribed fish sauce amphora from the site, 48 (or 78 %) were classified as Dr 7-13 amphorae, cf *CIL* xv.4710: G(arum) SC(ombri); 4713: LIQ(uamen); 4722: MUR(iae) F(los)/ AC / P. CORDI GRATI; 4723: MUR(iae) ARG(utae) / EXCE(llentis) / FLOS CN. DOMITI FELI[c]IO[nis]; 4718: G(ari) F(los); 4717: LIQ(uamen); 4690: G(ari) F(los); 4698: G(arum) SC(ombri); 4715: LIQ(uamen) FLOS; 4699; 4720; 4727; 4730; 4731; 4761; 4764; 4705; 4708; 4709; 4687: G(ari) SC(ombri) F(los) PUTEOLANI; 4688: G(ari) F(los) / PUTEOLANI. *CIL* iv.2588: LIQ(uamen) (flos) EXCE(llens) SCOMB(ri); 5651. Pompeii: *CIL* vi supp, 5659. A Dr 7-11 amphora from Vindolanda bears the inscription G(ari) F(los) S(combri), cf Wright, R P and Hassall, M W C (1974) "Roman Britain in 1973" in *Britannia* 5 p 467 n° 44, whilst that from Fos-sur-Mer records its contents as [garum] SCOMB(ri) FLOS / AA / [.] IUNI CILONIS / [e]X OF(ficina) AUGG(ustorum), cf Liou, B and Marichal, R (1978) "Les Inscriptions peintes sur amphores de l'Anse Saint-Gervais a Fos-sur-Mer" in *Archaeonautica* 2 p 131-135. Two *tituli* from Augst record *garum* and *muria* as the contents of Dr 7-11 amphora, cf Bohn, O (1926) "Pinselschriften auf Amphoren aus Augst und Windisch" in *Anzeiger für Schweizerische Altertumskunde* 28 p 202 n° 3: G HISPA ; p 203 n° 4: MUR HISP; although Bohn suggests these refer rather to *garum* and *muria* produced according to a Spanish recipe.

<sup>85</sup> *CIL* xv.4750; Zevi, F (1966) op. cit. n. 17 p 244: dated to AD 31.

considered important and thus not fish sauce.<sup>86</sup> The question has also been raised that the Tarraconensian Dr 7-11 amphorae attested at La Longarina, Ostia held wine, although there is no evidence in this regard.<sup>87</sup> Despite these possible exceptions, a link between Dr 7-11 and fish sauces seems a reasonable supposition.

As well as the evidence afforded by *tituli picti*, a number of vessels have produced remains of fish sauce or, as is more probable, of *Salsamentum* itself. Dr 7 vessels from the wrecksite of La Chrétienne H have produced fish bones.<sup>88</sup> Dr 10 vessels recovered from Bouches-du-Rhône were also found to contain fish bones<sup>89</sup> whilst two vessels from the Planier E wreck contained clams.<sup>90</sup>

Tarraconensian examples of the form provide little evidence as to date. The wreck at La Chrétienne H is dated to the middle of the first half of the First Century AD<sup>91</sup> whilst the stamp C. MUSSIDI NEP which appears on both Pascual 1, Dr 7-11 and Oberaden 74 forms is attested in levels dated to the early First Century AD.<sup>92</sup> The *titulus* of Iunius Cilo from Fos-sur-Mer appears to refer to a period of joint imperial rule - 'ex Officina Augustorum' - a state of affairs that is only possible during the joint reigns of Vespasian and Titus in the period AD 71-79 and that of Marcus Aurelius and Lucius Verus between AD 161-169 - both of which attributions are somewhat problematic as this form of nomenclature is evident only from the latter period whilst the vessel itself is in abeyance by this time.<sup>93</sup> The appearance of the stamp of L. VOLTEIL(us) on both Pascual 1, Dr 2-4 and Dr 7-11 from El Sot del Camp supports a date in the late First Century BC - early First Century AD<sup>94</sup>. At Llafranc the finds of Terra Sigillata Sud-Gallica<sup>95</sup>, Terra Sigillata Marmorata<sup>96</sup>, fine-walled Mayet XLI

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<sup>86</sup> cf Sealey, P R (1985) op. cit. n. 31 p 84; on the use of Dr 7-11 for wine, cf Beltrán Lloris, M (1987) op. cit. n. 35 p 60-61.

<sup>87</sup> cf Hesnard, A (1980) "Un depot Augustéen d'amphores a La Longarina, Ostie" in D'Arms, J H and Kopff, E C The Sea-borne Commerce of Ancient Rome: Studies in Archaeology and History Memoirs of the American Academy in Rome 36 (Rome) p 141-156.

<sup>88</sup> cf Parker, A J (1992) op. cit. n. 4 p 143.

<sup>89</sup> cf Benoit, F (1962) "Nouvelles épaves de Provence (III)" in Gallia 20 p 148-9.

<sup>90</sup> cf Benoit, F (1962) op. cit. n. 89 p 158 n. 8.

<sup>91</sup> cf Corsi-Sciallano, M and Liou, B (1985) Les Epaves de Tarraconense a chargement d'amphores Dressel 2-4 Archaeonautica 5 (Paris); cf also Miró i Canals, J (1988) op. cit. n. 22 p 104.

<sup>92</sup> cf Hesnard, A (1980) op. cit. n. 87.

<sup>93</sup> R.I. Curtis pers. comm.

<sup>94</sup> cf Pascual Guash, R (1977) op. cit. n. 29 p 65.

<sup>95</sup> Dragendorff 18, 24/25, 29, 37 and Ritterling 8.

<sup>96</sup> Dragendorff 27.

vessels and Terra Sigillata Aretina<sup>97</sup> point to the principal period of occupation as being the mid First Century AD.<sup>98</sup> The main phase of exportation from L'Aumedina (Tivissa) seems to have been the early First Century AD with finds of the stamp, TIBISI, in undated contexts at Fos, Vieux-Port de Marseilles, Saint-Cyr-sur-Mer and Port-la-Nautique, as well as at Pompeii giving a date in the first half of the First Century AD.<sup>99</sup> Unfortunately deposits within Cataluña are dated primarily through the amphora forms found there, making any precision in the dating of these sites impossible, even so the dating of Tarraconensian Dr 7-11 would seem to have been in accord with the dates afforded for the form more widely. The type seems to first have been produced in Baetica at a number of kilns around the Bay of Cadiz<sup>100</sup> before production spread over much of the Western Mediterranean in the late First Century BC - early First Century AD, continuing in use until the close of the First Century AD.

Although Dr 7-11 seem to have been the principal vessel form used in the movement of fish sauces from Tarraconensis, a number of other forms of related use may also have been produced within the region, the most numerous being Dr 38 (Pelichet 46/ Beltrán II) vessels. Typologically these vessels may be an evolution of Dr 7-8 forms, possessing a similar body profile but being marked by a broad neck or mouth - little different in diameter from the bag-shaped body which ends in a pronounced, hollow point (**fig. 29.1**).<sup>101</sup> Dr 39 vessels are similar, although lacking the more exaggerated mouth and neck profile. As befits a form based on the earlier production of Dr 7-8, these vessels are primarily associated with the Cadiz region in Baetica. They have been found at a number of sites within the region with which we are concerned: El Saler (Valencia)<sup>102</sup>; within the late Republican fish factory at

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<sup>97</sup> Goudineau 38 and Haltern 14.

<sup>98</sup> cf Barti Catala, A and Plana Mallart, R (1993) op. cit. n. 45 p 94-95.

<sup>99</sup> cf Revilla Calvo, V (1993) op. cit. n. 76 p 162. Oberaden 74 vessels bearing the stamp SEX.DOMITI from the same site have been found in a number of Augustan deposits along the German frontier: Oberaden (11-8 BC); Neuss (occupied from 19/16 BC); Dangstetten (15/9-7 BC); Basel-Münsterhügel. The deposits at Lugano and Nyon may also be Augustan in date.

<sup>100</sup> cf Peacock, D P S (1974) "Amphora and the Baetican fish industry" in *AJ* 54 p 232-243; Campano Lorenzo, A (1994) "De la produccion de ánforas de salazón en la Bahía de Cádiz. Materiales del alfar de 'El Olivar de los Valencianos', Puerto Real" in *AEA* 67 p 135-146. One should note, however, that the only datable evidence from the kiln site at Puerto Real was a coin of Claudius, cf Peacock, D P S and Williams, D F (1986) op. cit. n. 2 p 74.

<sup>101</sup> Peacock, D P S and Williams, D F (1986) op. cit. n. 2 class 18.

<sup>102</sup> cf Ribera Lacomba, A and Fernandez Izquierdo, A (1985) op. cit. n. 41 p 89.

L'Almadraba (Albufera)<sup>103</sup>; El Monastil (Elda)<sup>104</sup>; within the fish factory at Santa Pola<sup>105</sup>; Grau Vell (Sagunto)<sup>106</sup>; Riells-La Clota<sup>107</sup>; Mijares<sup>108</sup>; Pecio Castillo, Cabo de Palos<sup>109</sup> and Mazarrón<sup>110</sup>. These vessels are most probably representatives of the exportation of fish sauces from Baetica, although the finds from the fish factories at Santa Pola and L'Almadraba may represent a local source<sup>111</sup> or perhaps the shipment of empty amphorae for use at these sites.<sup>112</sup>

The use of Dr 38-39 in the transport of fish sauce is evidenced both by *tituli picti* and by finds associated with the remains of fish, as at Port Vendres II where examples were found to contain mackerel bones.<sup>113</sup> A Dr 39 vessel from Castro Pretorio, Rome records its contents as having been G(ari) F(los) / AA ATINIS / DOM...<sup>114</sup> Examples were found associated with a cargo of Dr 14 vessels containing *liquamen* within the wreck at Pecio Gandolfo and have produced fish bones.<sup>115</sup>

As mentioned above the form seems to have been an evolved form of Dr 7-8 vessels of the early First Century AD and they first appear in the Flavian period, or even earlier - those from Pecio Gandolfo are amongst the earliest attested. Production of the form in the Bay of Cadiz may date as early as the reign of Claudius.<sup>116</sup> They are

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<sup>103</sup> cf Reynolds, P (1993) op. cit. n. 57 p 61-2.

<sup>104</sup> cf Reynolds, P (1993) op. cit. n. 57 p 77.

<sup>105</sup> cf Sanchez Fernandez, Ma J, Blasco, E and Guardiola, A (1989) "Descubrimiento de una factoria bajoimperial de salazon de pescado en Santa Pola (Alicante)" in *Saguntum* 22 p 413-441.

<sup>106</sup> cf Mantilla Collantes, A (1987) op. cit. n. 44 p 395.

<sup>107</sup> cf Nieto Prieto, F J and Nolla i Brufau, J Ma (1985) "El yacimiento arqueologico submarino de Riells-La Clota y su relacion con Empúries" in *Cypsela* 5 p 150.

<sup>108</sup> cf Fernandez Izquierdo, A (1982) "Estudio del trafico maritimo en la costa de Castellon. A traves de la Arqueologia Submarina" in *Saguntum* 17 p 121.

<sup>109</sup> cf Mas, J (1985) "El Poligono Submarino de Cabo de Palos. Sus Aportaciones al estudio del trafico maritimo antiguo" in *VI CIAS Cartagena 1982* (Cartagena) p 153-171.

<sup>110</sup> cf Ramallo Asensio, S F (1985) "Envases para Salazones en el Bajo Imperio (I)" in *VI CIAS Cartagena 1982* (Cartagena) p 438.

<sup>111</sup> It has been suggested that bag-shaped amphorae from the wreck of Escolletes II, Cabo de Palos, Cartagena may represent the production of a local variant of Dr 38, cf Mas, J (1985) op. cit. n. 109 p 164-7, the local origin and relationship to Dr 38 is the supposition of Parker, A J (1992) op. cit. n. 4 p 173.

<sup>112</sup> The question of the movement of empty amphorae shall be discussed shortly - we have already noted the possibility that amphorae from Tivissa were used in the transport of sauces from Carthago Nova.

<sup>113</sup> cf Parker, A J (1992) op. cit. n. 4 p 330-331; also cf Parker, A J and Price, J (1981) op. cit. n. 37.

<sup>114</sup> cf *CIL* xv.469 b.

<sup>115</sup> cf Pascual Guash, R (1960) "Dos anforas del Pecio Gandolfo (Almeria)" in *Zephyrus* 11 p 205-209.

<sup>116</sup> cf Peacock, D P S (1974) op. cit. n. 100 p 236; Peacock, D P S and Williams, D F (1986) op. cit. n. 2 p 73-76.

attested within Augustan deposits at Lyon<sup>117</sup> and we have already referred to their presence at a late Republican date at L'Almadraba. The presence of the form at Pompeii must predate AD 79<sup>118</sup> and it is present within deposits dated to the period AD 70-160 at London<sup>119</sup> although it is absent from the deposits at La Longarina, Ostia.<sup>120</sup> A substantial deposit of this form was found within the wrecksite of Chiessi where sealed amphorae were found containing bones of mackerel. The site was dated to the period 60-85 AD.<sup>121</sup> That some overlap in production existed between these forms and the earlier Dr 7-11 forms would appear to be evidenced by their identification with Dr 7-11, Dr 12 and Haltern 70 at the wreck of Tour Sainte Marie A (Corsica) that is dated between AD 30-53.<sup>122</sup> It seems likely, therefore, that the production of these vessels began in the second quarter of the First Century AD, ending sometime in the early Second Century AD.

Dr 12 amphorae have been found within the wreck located at San Ferreol, Cabo de Palos, Cartagena where they are dated to the First Century AD.<sup>123</sup> The form is characterised by a long, slender neck with a long cylindrical body tapering into a solid point (fig. 29.3). They originate in Baetica being attested at the kiln of Algeciras.<sup>124</sup> Examples from Pompeii bear *tituli* recording their contents as being *garum flos*, *garum scombri flos* and *liquamen scombri flos*.<sup>125</sup> Vessels found within the wreck at Titan contain tunny bones and molluscs and are associated with pottery dated to the First Century AD.<sup>126</sup> Although not a widespread form it is attested at a number of wrecksites dated from the second half of the First Century BC to the mid First Century AD.<sup>127</sup>

<sup>117</sup> cf Campano Lorenzo, A (1994) op. cit. n. 100 p 139.

<sup>118</sup> cf Manacorda, D (1977) "Anfore Spagnole a Pompei" in *L'Instrumentum Domesticum di Ercolano e Pompei* (Rome) Quaderni di Cultura Materiale 1 p 121-132.

<sup>119</sup> cf Sealey, P R (1985) op. cit. n. 31 p 84.

<sup>120</sup> cf Hesnard, A (1980) op. cit. n. 121 p 148.

<sup>121</sup> cf Parker, A J (1992) op. cit. n. 4 p 140.

<sup>122</sup> cf Tchernia, A (1969) "Direction des recherches archéologiques sous-marines" in *Gallia* 27 p 496-499; also Parker, A J (1992) op. cit. n. 4 p 432; Tchernia, A (1971) op. cit. n. 24 fig. 5.

<sup>123</sup> cf Mas, J (1985) op. cit. n. 109 p 205. Examples of the form have also been found in the Plaza de la Reina, Valencia, cf Fernandez Izquierdo, A (1984) op. cit. n. 45 p 49.

<sup>124</sup> cf Peacock, D P S and Williams, D F (1986) op. cit. n. 2 p 113-114 class 14.

<sup>125</sup> cf Manacorda, D (1977) op. cit. n. 118 p128-129; cf also *CIL* iv.2588: LIQ(uaminis) F(los) SCOM(bri).

<sup>126</sup> cf Mas, J (1985) op. cit. n. 109 p 205: Campanian ceramic B wares, Dr 3 lamps etc.

<sup>127</sup> Two examples from the Castro Pretorio, Rome record *gari puteolani*, cf *CIL* xv.4687: G(ari) SC(ombri) F(los) / PUTEOLANI; 4688: G(ari) F(los) / PUTEOLANI.

Dr 14 amphorae are characterised by a piriform body, cylindrical in shape that ends in a hollow point, the rim is thick and the long vertical handles run from the upper neck to the shoulders of the vessel (fig. 29. 6). Their shape has led Gonzalez Serrano<sup>128</sup> to classify them with Dr 6, 8, 9, 11, 15 and Pelichet 46 forms. The earliest centres of production seem to have been in Baetica, being produced at Calahonda and Motril during the First Century AD<sup>129</sup> before the form was adopted elsewhere, notably in Lusitania in the mid First Century AD.<sup>130</sup> The form has been noted at a number of wrecksites along the coasts of Tarraconensis: at Pudrimel Norte and Bajo de la Campana II (Cabo de Palos, Cartagena)<sup>131</sup>, El Saler (Valencia)<sup>132</sup>, Riells-La Clota (Empúries).<sup>133</sup> An amphora of this form is preserved in the collection of Don Mariano Navarro as being from Javea and may, therefore, be associated with the fish factories at that location.<sup>134</sup> Although this form is conventionally linked with production in Baetica and Lusitania, a local origin within Cataluña is also possible. A cargo of Dr 2-4 amphorae have been located at the wreck site of Sud-Lavezzi C within the Straits of Bonifacio.<sup>135</sup> The vessels clearly originated in Tarraconensis and amongst the stamps attested are several that were produced at kilns within the region<sup>136</sup> and it seems reasonable to conclude that the cargo originated in the area of the Baix Llobregat and, more precisely, from the kilns of Can Tintorer and Can Pedrerol de Baix. Significantly the cargo also included individual examples of Pascual 1 and Dr 14 amphorae for which a similar source to that of the Dr 2-4 vessels seems likely. *Tituli Picti* and finds of the remains of fish confirm the use of this form in the transport of *salsamentum* and related products. An example from Saint-Gervais bears the *titulus*: LIQ(uamen) / EXC(ellens) /

<sup>128</sup> cf Gonzalez Serrano, Ma P (1988) op. cit. n. 73 p 297. We have already referred to her belief in a Punic prototype for these forms.

<sup>129</sup> cf Edmondson, J C (1987) *Two Industries in Roman Lusitania* BAR Int. Ser. 362 (London) p 162.

<sup>130</sup> cf Parker, A J (1977) "Lusitanian Amphoras" in *Methodes Classiques et Methodes Formelles dans l'etude des amphores* (Rome) p 35-43.

<sup>131</sup> cf Mas, J (1985) op. cit. n. 109 p 164.

<sup>132</sup> cf Martin, G and Saludes, J (1966) op. cit. n. 45 p 166

<sup>133</sup> cf Nieto Prieto, F J and Nolla i Brufau, J Ma (1985) op. cit. n. 107 p 150.

<sup>134</sup> cf Martin, G and Serres, Ma D (1970) op. cit. n. 57 p 107.

<sup>135</sup> cf Parker, A J (1992) op. cit. n. 4 p 415.

<sup>136</sup> ALEX - Can Pedrerol de Baix; CELSI - Can Pedrerol de Baix, Can Tintorer (CELS); AC - Can Tintorer; PHIL - Can Tintorer; the stamp QVA from La Chretienne H is associated with the stamp QAE from Can Tintorer; ANDO - Can Tintorer; QVAD - Can Tintorer; (CELS) - Badalona.

SABINI ET AVITI<sup>137</sup>, whilst those from Pecio Gandolfo bear a largely illegible *titulus* which seems to be related to an example from the Castro Pretorio in Rome, which reads LIQ(uaminis) FL(os) / EXCEL(lens) / L PURELLI (or AURELLI) CTEMELI.<sup>138</sup> In terms of chronology we have already referred to the production of this form at sites within Baetica during the mid-First Century AD, a date which concurs with that of the Lusitanian production sites - that of Quinta da Alegria is attested from AD 50.<sup>139</sup> They appear within Claudian levels at Conimbriga and those from Herculaneum must antedate AD 79. The finds associated with Pascual 1 and Dr 2-4 amphorae at Sud-Lavezzi 3 must be dated to the beginnings of the First Century AD. The kilns of Can Pedrerol and Can Tintorer are both dated to the First and Second Centuries AD on the basis of the amphorae found, although the former site has produced coins of Claudius and Galba.<sup>140</sup> An origin in the early First Century AD seems, therefore, to be logical and conventionally the form is believed to have remained in use until the Third Century AD.

As well as the four forms recognised by Beltrán as having carried fish sauce products, a number of less clearly defined forms also deserve notice in this regard. As with the other piriform vessels classified by Gonzalez Serrano,<sup>141</sup> Dr 15 vessels are believed to have originated in Baetica and to have been in use during the first two Centuries AD. They are marked by a narrow, convex neck, straight handles surmounted by a prominent lip (**fig. 29.7**). The body is of a pronounced bag shape ending in a hollow point. Lamboglia associates the form with Dr 6 amphora as dating to the early First Century AD<sup>142</sup>, a date that is supported by their presence at the Castro Pretorio, Rome. A *titulus* from the latter site, although badly damaged, preserves the word EXCE(lens) - an appellation that was regularly applied to *garum* or a similar sauce.<sup>143</sup> The Grand Congloué C wreck has produced a number of amphorae relating either to

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<sup>137</sup> cf Edmondson, J C (1987) op. cit. n. 129 p 162.

<sup>138</sup> cf Pascual Guash, R (1960) op. cit. n. 115 p 206-7.

<sup>139</sup> cf Edmondson, J C (1987) op. cit. n. 129 p 162.

<sup>140</sup> cf MirÛ i Canals, J (1988) op. cit. n. 22 p 16-20.

<sup>141</sup> cf Gonzalez Serrano, Ma P (1988) op. cit. n. 73 p 297-8.

<sup>142</sup> cf Zevi, F (1966) op. cit. n. 17 p 220.

<sup>143</sup> CIL xv.4746. Curtis, R I (1991) op. cit. n. 5 p 220, lists ten such associations between fish sauce and the adjective 'excellens' within *tituli*.

Dr 12 or to Dr 16 vessels.<sup>144</sup> These are cited as having originated at Almería and as dating to the Second Century AD.<sup>145</sup> They are a long thin form with a tapered body and pronounced handles. As to contents we have little or no evidence although a *titulus* records LIQ(uamen) ANTIA(tinum) EXC(ellens).<sup>146</sup>

Dr 21-22<sup>147</sup> forms are characterised by a wide mouth and neck which shows little separation from the cylindrical body which tapers to a small point (**fig. 29.4**). The handles are short and angular. They may, in fact, be an evolution of Dr 18/Mañá C vessels of the Republican period and have several features in common with a later derivative, the Almagro 53 form.<sup>148</sup> Conventionally they are ascribed to an Italian origin within Latium and Campania<sup>149</sup>, although it would appear that production was more widely distributed. An example of this form has been found at Zaragoza bearing the stamp IULI THEOPHIL which is also attested on Pascual 1 vessels from Port-la-Nautique, Novaesium, Narbonne, Cap del Vol (Gerona)<sup>150</sup>, Vielle-Toulouse, Vienne, Lyon.<sup>151</sup> As before, we have little evidence as to the contents of these vessels although they have been linked with the wine merchant, L. Volusius Saturninus<sup>152</sup> and are conventionally associated with the shipment of fruit. Recently Gonzalez Serrano, however, has argued against Zevi's hypothesis and has suggested that they may in fact have been used for fish sauce.<sup>153</sup> An example of the form from the Castro Pretorio, Rome bears a *titulus* reading HALLEC.<sup>154</sup>

Dr 33 forms appear to be related to Dr 30 which seem to have been used in the shipment of Mauretanian oil.<sup>155</sup> A single example has been found off the coast of

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<sup>144</sup> cf Parker, A J (1992) op. cit. n. 4 p 202.

<sup>145</sup> cf Gonzalez Serrano, Ma P (1988) op. cit. n. 73 p 294.

<sup>146</sup> *CIL* xv.4712.

<sup>147</sup> Dr 18 - Mañá C2 vessels have already been discussed in Chapter 2.

<sup>148</sup> cf Gonzalez Serrano, Ma P (1988) op. cit. n. 73 p 302-3.

<sup>149</sup> cf Zevi, F (1966) op. cit. n. 17 p 222.

<sup>150</sup> cf Beltrán Lloris, M (1987) op. cit. n. 35 p 57-61.

<sup>151</sup> cf Miro i Canals, J (1988) op. cit. n. 22 p 218. Examples of this form may be included with Mañá C2 amphorae as the cargo of the Scoglio della Formica A wreck near Porticello, Sicily that is dated to the Second Century BC, cf Parker, A J (1992) op. cit. n. 4 p 390. Mañá C forms appear to have had a North African origin and are linked with the kiln at Kouass in Morocco, cf chap. 2.

<sup>152</sup> cf Zevi, F (1966) op. cit. n. 17 p 222.

<sup>153</sup> cf Gonzalez Serrano, Ma P (1988) op. cit. n. 73 p 302-303.

<sup>154</sup> *CIL* xv.4730.

<sup>155</sup> An example from the fishery at Punta de l'Arenal recorded its origin as being the city of Tubusuctu, cf Bolufer, J (1987) op. cit. n. 45 p 445: MAUR CAES / TUBUS.

Valencia in the archaeological zone of El Saler.<sup>156</sup> The vessel possessed a sharply tapering body, a short neck and fusiform handles that are more curved than those of Dr 33 and are closer to Dr 30 forms. The vessel is dated to the late Third Century - Fourth Century AD. We have little knowledge as to the contents or origin of these vessels, although an example from Rome bears the name *Barbarus Probianus c(larissimus) v(ir)* and records its contents as being *liquamen*. The vessel may be associated with the *Barbarus Probianus* who was consul and *Praefectus Urbi* in the Fourth Century AD.<sup>157</sup>

The forms discussed above are on the whole poorly attested within *Tarraconensis* and their association with specific contents is subjective. They are marked by a loose typological similarity as well as a date, in most cases, in the First Century AD and a principal centre of production in the coastal regions of Southern Spain. Of the forms attested in this regard, only Dr 7-11 can be definitely ascribed to an origin within the region with which we are concerned; Dr 21-22 being the only other form normally associated with fish sauces to be produced within the area. Despite the parlous state of knowledge pertaining to production within much of the region, particularly within the central provinces of Valencia and Castellon, production seems to have centred upon wine amphorae: Pascual 1, Dr 2-4 and the more problematic Dr 28; it is also possible that the Dr 7-11 amphorae found within the region served a similar function. Sadly, as we have mentioned above, the paucity of our knowledge of amphorae and their uses has led to a tendency to group particular types of amphorae within the same economic role and to assume contents on the basis of the economic focus of the producing region, thus there is a tendency to view all amphora produced in North Africa as having transported olive oil, even though an extensive fish-salting industry flourished within the region; that vessels from *Laietania* carried wine, and so forth. What should be apparent from the discussion of the more marginal forms outlined above is that no such certainty exists.<sup>158</sup> Even the better classified forms: Pascual 1, Dr 2-4, Dr 28, Dr 7-11, Dr 38-39, Dr 12-13 and Dr 14 have afforded evidence for uses other than those with which they are more regularly associated - we

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<sup>156</sup> cf Martin, G and Saludes, J (1966) op. cit. n. 45 p 169.

<sup>157</sup> cf Zevi, F (1966) op. cit. n. 17 p 226-7.

<sup>158</sup> The only real exception to this being Dr 20 oil amphorae, the connection between Dr 1 forms and their variants with wine is more subjective.

have already referred to the possible use of Dr 7-11 amphorae for Gaditanian wine.<sup>159</sup> Further to this the coincidence of names on Dr 7-11 and other wine amphora forms produced within the region may allude to a similar function although I cannot cite any evidence for a correlation between amphora stamps and contents. Although it has been argued that the inland location of Tivissa precludes the use of the amphora produced there for anything other than wine<sup>160</sup>, such a criterion is, I believe, misplaced: communications form an essential prerequisite of kiln sites and, as we shall see, Tivissa is no exception to this, possibly even going as far as to supply amphorae for the fishing industry in Carthago Nova. In fact the movement of amphorae from points of production to that of demand, sometimes over extensive distances, may have been a regular part of the ancient economy.<sup>161</sup> The Tarraconensian Dr 9 amphorae found at La Longarina have been cited as containing wine on the basis of their having a resin lining - a fact that, in reality, only prevents their use in the shipment of olive oil and is of no significance in the differentiation between wine and fish sauce. A Dr 7-11 amphora may have contained Aminean wine<sup>162</sup>, whilst its stamp would indicate an origin within Tarraconensis.<sup>163</sup> As well as Dr 7-11 amphorae, there is some uncertainty as to the contents of Dr 38-39 vessels. An example from Pompeii records its contents as being the syrup, *defrutum*.<sup>164</sup> An amphora from Saint-Gervais bears the *titulus* DEFR(utum) EXCELL(ens)<sup>165</sup>, although this vessel may in fact be of Haltern 70.

Thus, although there are grounds for some reticence in merely confining these amphora forms to the transit of fish sauce, the same caution is equally applicable to other amphora types also. We have already discussed the various contents that can be shown to have been carried in Dr 28 wine amphora and a number of forms more regularly associated with wine are recorded as having contained fish sauces. A Dr 2-4 vessel found in Flavian levels at London bears a *titulus* that records its contents as

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<sup>159</sup> The use of this form in the transport of products such as *Laccatum* and other fish sauce variants has already been discussed in chapter 1.

<sup>160</sup> cf Tchernia (1971) op. cit. n. 24 p 68-9.

<sup>161</sup> cf Paterson, J (1982) op.cit. n. 19.

<sup>162</sup> *CIL* xv.4533.

<sup>163</sup> cf Tchernia (1971) op. cit. n. 24 p 69 n° 76: LV.

<sup>164</sup> *CIL* iv.9324.

<sup>165</sup> cf Liou, B and Marichal, R (1978) op. cit. n. 84 p 144-145.

being *liquamen* from Antipolis is Southern France.<sup>166</sup> Examples of the form from the Dramont D wreck appear to have contained dates.<sup>167</sup>

Although such examples are not sufficient cause to reject the association between forms and contents of amphorae, they are cited so as to ensure a degree of circumspection in the consideration of amphorae. It is evident that the principal focus of amphora production during the First Century BC - Second Century AD lay with the wine industry, but the provision for other goods within this period should not be overlooked.

Thus far we have dealt almost exclusively with a typological survey of the amphorae concerned which, although important, can tell us little of the economic function and horizon within which these vessels are to be placed. To answer some of these problems requires an understanding of the production of these vessels and of its interrelationship with other aspects of the economy. In order to put the information outlined above into perspective, therefore, we shall now turn our attention to the evidence for the production of these forms within Tarraconensis, particularly that of Dr 7-11 vessels, although we have seen that Dr 28 amphora may also have been used in the shipment of salt fish products.

## 2. AMPHORA PRODUCTION IN TARRACONENSIS

Although Tarraconensis is often cited as one of the most studied regions of the Empire in this regard - thanks largely to the works of Ricardo Pascual, Jordi Miró and Simon Keay<sup>168</sup> - the imbalance created can be misleading. Studies of the ancient economy have concentrated upon the amphora themselves, which although supplying a distribution of forms - and thus possibly a particular regional product, tell us little about the economic background of the vessels, that is, who produced them and why? The kilns themselves often can only be identified on the basis of the scatter of amphorae

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<sup>166</sup> cf Peacock, D P S and Williams, D F (1986) op. cit. n. 2 p 106; cf Sealey, P R (1985) op. cit. n. 31 p 83: LIQUAM / ANTIPOL / EXC / L TETTI AFRI / CANI.

<sup>167</sup> cf Peacock, D P S and Williams, D F (1986) op. cit. n. 2 p 106.

<sup>168</sup> The region of Cataluña, in particular, has been the objective of fairly intensive survey, cf Prevosti, M (1991) "The establishment of the Villa system in the Maresme (Catalonia) and its development in the Roman period" in Barker, G and Lloyd, J *Roman Landscapes* p 135-141, which has enabled the completion of a distribution map of rural settlement.

found, and where they are recorded, are in many cases the objects merely of brief notes in archaic texts or have been the subjects of brief soundings or rescue excavations. The urban centres that formed the foci of amphora kilns have continued to be important centres of population, as for example are the cases at Barcino (Barcelona), Tarraco (Tarragona) and so on, which makes any systematic and complete survey an impossibility. Much production was based in rural *villae* which, despite the growth of regional survey - most notably in Italy and N. Africa - are still discovered largely by chance without any organised excavation taking place. Thus although we can posit the existence of extensive distributions of amphora kilns, we do in fact know little or nothing about many of the sites beyond the presence of amphorae. The obvious deficiencies in our knowledge have prompted a concentration upon the kiln sites themselves and a quantification of production along provincial lines - one particularly notes the work of Mattingly in Libya, Peacock in the Sahel region of Tunisia, and Ponsich's work in the Guadalquivir valley - the lure of more distributive studies is still strong.<sup>169</sup> Even in the best studied of the Catalan kilns/villa sites - L'Aumedina and Vilauba - the paucity of archaeological remains - for many of these sites the only concrete evidence is afforded by the amphora themselves - means that we can make little definite judgement as to the nature of the local economy. Even so, the differentiation between local, inter- and intra-regional exchange is an important one, particularly when considering the minimalist/modernist debate that has dominated modern views of the ancient economy<sup>170</sup> - in fact many of the arguments as to the character of the ancient economy have arisen precisely because of the lack of systematic archaeological research. Despite the problems involved in such a study we shall attempt to discuss the economic background and relative importance of these patterns of exchange by looking in more detail at the production of Dr 7-11 amphora within the region and to point, albeit tentatively, to a series of classifications in the types of amphora production that took place.

Any study of the location of amphora production requires an understanding of the techniques involved in the firing and preparation of the vessels as such appear to

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<sup>169</sup> cf, for example, Miró i Canals, J (1988) op. cit. n. 22.

<sup>170</sup> cf Finley, M (1973) The Ancient Economy (London).

have been of primary importance in dictating the location of kilns.<sup>171</sup> The process of producing a ceramic vessel can be divided into five principal stages: firstly, the acquisition of the clay. This would most usually be achieved by the digging out of clay deposits, although few sites have afforded evidence of this. The clay would then be broken down and mixed with water - large inclusions would be removed by a process of levigation by which the coarser deposits would be drawn off. A temper would be added and the clay mixed either by hand or possibly a mechanical process may have been used - although this is unlikely to have been widespread and paved areas identified within the areas of ancient kilns may have been used as mixing floors. Although a number of coarse ware forms are described as having been hand-made, the principal method of forming a vessel would appear to have been by the wheel and many of the coarse wares believed to have been hand-formed are fine enough to suggest the use of a wheel - in fact traces of such have been identified at a number of sites. It seems probable that amphorae were wheel turned in sections, being joined prior to firing. Although a variety of techniques appear to have been used by the potters to provide a finish for their vessels - burnishing, slipping and glazing are all attested - the character of amphorae as coarse utilitarian vessels will have rendered this superfluous although they do seem to have been washed to conceal coarse inclusions - often white in colour in those attested from Tarraconensis. The formed vessel would then be placed in the sun - or in larger production centres, in a warehouse provided with a hypocaust heating system - so as to dry any excess water from the clay which would cause the fragmentation of the fabric or warping when the clay is fired. A variety of techniques seem to have been used in the firing of vessels during the Roman period. Small scale production of coarse wares seems to have been carried out in surface kilns for which no archaeological evidence remains. More evidence is available for the existence of permanent kilns, most of which are up-draught kilns in which the vessels would be stacked on a perforated floor above the firing chamber beneath. Down-draught and twin-flue kilns may also have been in use but appear to have been rare. Several types of kiln seem to have been used, the most common being circular in shape with the firing

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<sup>171</sup> The fullest discussion of ancient kilns are to be found in Peacock, D P S (1982) *op. cit.* n. 1 and Swan, V G (1984) The Pottery Kilns of Roman Britain RCHME Supplementary Series 5 (London).

chamber supported either by a central pillar, through a central adjunct to the rear wall of the chamber, by a central arched flue and in some cases there are no attested supports. Rectangular kilns are also attested although the dynamics of the differentiation between the types is unclear<sup>172</sup> - although it has been suggested that the rectangular kilns were used in the production of brick and tile.<sup>173</sup>

Thus, from the discussion outlined above we see the need for three primary ingredients in the production of ceramic artefacts: firstly, the provision of clay resources; secondly, access to a ready supply of water; and finally, a supply of combustible material to fire the kiln. Although kiln sites are well attested within both Tarraconensis and the rest of the Roman world, there is little evidence as to the composition of the clay used. Clay can be acquired by one of two methods, either from the underlying bedrock or from deposition by wind, water or glacial deposition (known as primary and secondary sources respectively) and it seems that the latter was the most widely utilised.<sup>174</sup> This would require little more than the surface excavation of clay deposits and will leave no trace in the archaeological record.<sup>175</sup> It is also possible that clay was brought in from elsewhere<sup>176</sup> - perhaps even on an inter-provincial scale, although transport of such over long distances is unlikely to have been common, particularly when concerned with nucleated kilns such as are seen at Caldes de Montbui. It is noted by Sinopoli that potters typically acquire their raw materials within

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<sup>172</sup> cf Fletcher Valls, D (1965) "Tipologia de los hornos ceramicos Romanos de Espana" in *AEA* 38 p 170-174. The discussion of the processes production is derived largely from in Peacock, D P S (1982) op. cit. n. 1 p 52-74; Orton, C, Tyers, P and Vince, A (1993) *Pottery in Archaeology* (Cambridge) p 113-131; Sinopoli, C M (1991) *Approaches to Archaeological Ceramics* (New York) p 9-42; Greene, K (1992) *Roman Pottery* (Berkeley).

<sup>173</sup> cf in Peacock, D P S (1982) op. cit. n. 1 p 73.

<sup>174</sup> cf Orton, C, Tyers, P and Vince, A (1993) op. cit. n. 172 p 114.

<sup>175</sup> Larger scale quarrying may have taken place at larger scale ceramic production centres, cf the quarry at Heiligenberg - Forrer, R (1911) *Die Römischen Terra-Sigillata Töpfereien von Heiligenberg, Dinsheim und Ittenweiler in Elsass* (Stuttgart) - I regret that I have been unable to consult this source directly, it is cited by Peacock, D P S (1982) op. cit. n. 1 p 53. The incidence of excavated pits is attested in the kilns at Highgate Wood, cf Peacock, D P S (1982) op. cit. p 53, whilst the use of natural fissures may have taken place within the kiln site at Padro Alto, Tricio, La Rioja, cf Solovera San Juan, M E (1987) *Estudios sobre la Historia Economica de La Rioja Romana* Instituto de Estudios Riojanos. *Historia* 7 (Logroño) p 53.

<sup>176</sup> A number of *Negotiatores Cretarii* are known such as M. Secundinius Silvanus, a *Negotiator Cretarius Britannicus* attested at Coljinsplaat, cf Hassall, M (1978) "Roman Britain and the Rhine Provinces: epigraphic evidence for Roman trade" in Du Plat Taylor, J and Cleere, H (eds) *Roman Shipping and Trade: Britain and the Rhine Provinces* (London) p 41-46.

one to six kilometres from home<sup>177</sup>, longer distances only becoming possible when transport by water is available. The alluvial plains of the R. Ebro and Llobregat provide plentiful resources in this regard. The immediate hinterland of the kiln at L'Aumedina consists of gravel and clay levels that were exploited by means of small quarries for use in the manufacture of ceramics and building materials. Also present are levels of keuper used in the construction of plaster and of clay.<sup>178</sup> The quantities required by the kilns of *Tarraconensis* would seem to be insufficient for the transit of raw materials over any distance and the fluvial soils that mark the hinterland of Gerona, the Baix Llobregat and the Ebro Valley would make the local extraction of clay through the limited exploitation of surface deposits the most probable source for the attested potteries.

A fundamental element in the existence of a pottery industry is the provision of water, either from wells or through a natural source nearby. In none of the kilns so far excavated have any traces of wells been found.<sup>179</sup> In fact it seems to have been the norm for kilns to be located in relation to surface water deposits, either on the coastal plain adjoining river mouths as, for example, is the case at Mirafior near the R. Gerona; or within the interior along the lower approaches of the coastal mountains overlooking the plain. Such locations will have been well provided with alluvial streams draining into the coastal plain with the kilns often being only 10-20 metres from the source of water. Of the kilns producing Dr 7-11, that of L'Aumedina is typical in this regard lying one kilometre to the west of Tivissa on the sierras of Montalt and de la Creu, between the upper reaches of the gorges of the Fondo and Molí del Rei that empty into the R. Ebro, thus not only providing a supply of water, but also routes of communication for the distribution of the production of the kiln (**fig. 31**). Location in relation to such water courses seems to have been a primary characteristic of the distribution of *villae* in the hinterland of the *Ager Tarraconensis*.<sup>180</sup> Water will have been used both to form the clay into a malleable consistency to be worked and to purify the fabric. A number of

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<sup>177</sup> cf Sinopoli, C M (1991) op. cit. n. 172 p 15.

<sup>178</sup> cf Revilla Calvo, V (1993) op. cit. n. 76 p 17.

<sup>179</sup> The use of wells seems to have been more commonplace in the more Northerly provinces, being identified at a number of production sites such as Oxford, Halder and Rheinzabern, cf Peacock, D P S (1982) op. cit. n. 1 p 54.

<sup>180</sup> On the distribution of *Villae*, cf Prevosti, M (1991) op. cit. n. 168; Gorges, J G (1979) *Les Villas Hispano-Romaines* (Paris).

clay-lined tanks used in the levigation of clay have been identified at kiln sites, although they have yet to be identified within Tarraconensis: traces may have been found at the kiln site of Padro Alto, Tricio (La Rioja). Adjoining the kiln were found structures pertaining to workshops which contained a layer, approximately forty centimetres thick of worked clay overlying a virgin layer which may have served as a working floor. Nearby were found remains of Terra Sigillata and moulds. The clay lacks any inclusions and would appear to have been decanted thus following its levigation to remove impurities. The lack of large inclusions within the clay is striking and may point to its use in the manufacture of Terra Sigillata as opposed to coarse ware production which requires a lower level of purity.<sup>181</sup> Beyond this circumstantial evidence I have been unable to cite any further evidence pertaining to this aspect of the production of pottery and it seems probable that the processes involved followed those identified by Mezquíriz de Catalan<sup>182</sup> from Gallo-Roman kiln sites: a process that required the filtering of the clay in suspension through a number of vessels to remove the heavier impurities. Vessels used in this manner may have been identified with the kiln complex at Bezares.<sup>183</sup>

The third requirement is fuel both for the firing process, and perhaps to facilitate the drying that takes place after the forming of the wet clay. Although different types of fuel were recognised as having varying effects on the clay being fired<sup>184</sup>, the most common fuel seems to have been wood. The dominant vegetation of the coastal area of NE Tarraconensis seems to have been forests with the White Pine (*Pinus Halepensis*) and the Holm Oak (*Quercus Ilex*) predominating. By-products of the agricultural processes, such as the trimmings of fruit and olive trees might also have been used.

The siting of the kiln, therefore, requires access to three natural resources - clay, water, and wood - all of which seem to have been plentiful within the region. However, to function as an economically viable unit the kiln cannot survive purely on its basic manufacturing requirements - a ready market and access to routes of communication, both to reach such demand and to provide the resources not available

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<sup>181</sup> cf Solovera San Juan, M E (1987) op. cit. n. 175 p 54.

<sup>182</sup> cf Mezquíriz de Catalan, M A (1961) *Terra Sigillata Hispánica* 2 vols (Valencia) p 32.

<sup>183</sup> cf Solovera San Juan, M E (1987) op. cit. n. 175 p 53-54.

<sup>184</sup> cf Orton, C, Tyers, P and Vince, A (1993) op. cit. n. 172 p 116.

in the immediate vicinity. Transport and its role in the ancient economy has only comparatively recently been given the attention it deserves.<sup>185</sup> Although we have little literary evidence as to the relative costs of the different methods of transport used in the Roman period it is generally accepted that the most cost effective method of transport was by sea, being over twenty times cheaper than transit overland. Similarly river transport was five times cheaper. Thus, wherever possible, the bulk transport of low value commodities will have been by sea or river with the consequent effect on the distribution of artefacts and settlement.<sup>186</sup> Thus we see the clustering of *villae* along the coastal approaches and aligned towards the rivers that will have been plyed by river-boats transporting goods to the larger harbours on the coasts<sup>187</sup> - a trace of this shipment might be seen in an inscription recording a guild of shippers at Dertosa who may have been engaged in the movement of barges down the R. Ebro.<sup>188</sup> This

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<sup>185</sup> The trade routes per se. have long been recognised, cf Charlesworth, M P (1924) Trade-routes and commerce of the Roman Empire (Cambridge), but the mechanics of such routes and the decisive effect this has had on the economic structures of antiquity has had to wait until economic historians have adopted a more minimalist view of the ancient economy, cf Finley, M (1973) op. cit. n. 170.

<sup>186</sup> The question of relative transport costs need not delay us unduly, however, it is worth outlining the principal arguments here. Few texts refer to the relative costs of transport, although Cato (On Agriculture 22.3) states that it would cost 400 HS to set up a mill at Suessa, of which 72 HS accounts of the transport of the mill for the 25 miles to Suessa, a journey which took six days and cost approximately one HS per mile, whilst shipment to Pompeii, 75 miles away cost 280 HS (cf Yeo, C A (1946) "Land and Sea transportation in Imperial Italy" in TAPA 77 p 221-244). Such transport would, therefore, effectively double the price of the commodity over 100 miles. As well as the description of Cato, the Edict of Diocletian, promulgated in AD 301 also provides figures for the cost of transport (cf Duncan-Jones, R P (1977) The Economy of the Roman Empire (Cambridge) p 366-369). According to the Edict the cost of a 1,200 lb wagon was 20 *denarii* per mile, which allowing for driver's wages, fodder and so forth will have increased this figure to c200 *denarii* p.d., or 3,000 *denarii* per 100 miles (75% of the purchase price) with the added duration of two weeks transit time (cf Leighton, A C (1972) Transport and Communication in Early Medieval Europe, AD 500-1100 (Newton Abbot) p 157-162). Even though the use of pack animals seems to have been more economic, such prices cannot compare with maritime transport by which the price of a cargo of grain would increase by only 10 % over 800 miles. Thus any major economic unit or centre of population would require location upon a waterway or access to the sea. Such may go some way to explain why there was a famine in Antioch in 362-3 despite grain supplies being only 50 miles away overland. The Younger Pliny wrote to Trajan from Nicomedia proposing a canal from the Sea of Marmara to Lake Sophon to cut transport costs. Similarly Strabo cites the use of the rivers of Gaul as trade routes, an aspect which is borne out by the distribution of Dr 1 amphora into the region (cf Fitzpatrick, A (1985) op. cit. n. 23; Greene, K (1986) op. cit. n. 1 p 39-40).

<sup>187</sup> One of the criteria given by Strabo for the blessed character of Turdetania are the numerous navigable rivers linking the cities of the interior of the coast, cf Geography 3.2.4, cf also 3.3.4 on the use of rivers to provide access to the interior of Lusitania.

<sup>188</sup> cf West, L C (1929) Imperial Roman Spain: The Objects of Trade (Oxford) p 10; CIL xi.4055. On the role of the R. Ebro, cf Dupre, N (1973) "La place de la Vallee de l'Ebre dans l'Espagne Romaine" in MCV 9 p 133-175. Thus we see the operation of guilds of boatmen - *lintrarii* and *scapharii* on the Guadalquivir as far as Hispalis. That these seem to have been locally sub-divided would appear to be

concentration is best seen in the Guadalquivir valley where the kilns producing Dr 20 oil amphorae are located directly to exploit the transport opportunities afforded by the river.<sup>189</sup>

Thus, not only did the provision of water form a necessity for the production of pottery, but the rivers themselves will have afforded a means of communication for the kilns, both in terms of the provision of raw materials but also in the distribution of products to market centres and to points of redistribution along the coast. This access to routes of supply has played a central role in the interpretation of the Dr 7-11 amphorae produced at L'Aumedina as it has been argued that the location of the kiln in the interior, in the mountains of Montalt and de la Creu, precludes its use in the transport of fish sauce and that they must, therefore, have been used in the exchange of wine produced in the region.<sup>190</sup> Such an argument is, I believe, misplaced on two counts: firstly, to function as an economic unit a kiln requires routes of communication with the regions beyond the immediate hinterland; and secondly, Paterson<sup>191</sup> has cogently argued in favour of the movement of empty amphorae from points of production to that of supply. Although the plateau of Tivissa, upon which the kiln is located, is separated from the Ebro valley by the massifs of Montalt and de la Creu, which extend up to 700-900 m, they are severed to the north and south by the gorges of Fondo and Molí del Rei which empty into the R. Ebro to the south of Mora d'Ebre.<sup>192</sup> From the distribution of coinage, amphorae and other ceramic evidence the importance of the Ebro as a means of communication is clear<sup>193</sup> and it will have been through this that the products of L'Aumedina reached the market and distributive centres of the coast, principally the provincial capital at Tarraco. The alignment of kilns along the rivers penetrating the interior and providing ease of transport can be seen

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the case from references to the *Lyntrari Canamenses*, *Oducienses* and *Naenenses*, as well as the *Scapharii Romulae Consistentes*, *Scapharii qui Romulae negotiantur* and *Scapharii Hispalenses*. Inscriptions from Merobriga and Olisipo record the operation of guilds of *codicarii* on the R. Tagus, whilst Strabo (*Geography* 3.3.9) tells us that the Douro and Baenis are also navigable for large vessels. Pliny (*NH* 3.21) describes the Ebro as being enriched by commerce.

<sup>189</sup> cf Ponsich, M (1988), (1974), (1979) op. cit. n. 14.

<sup>190</sup> Tchernia, A (1976) 'L'Atelier d'amphores de Tivissa et la marque 'Sex Domiti'' in *Melanges Heurgon* 973-979.

<sup>191</sup> cf Paterson, J (1982) op. cit. n. 19.

<sup>192</sup> On the geographical location of L'Aumedina, cf Revilla Calvo, V (1993) op. cit. n. 76 p 15-19.

<sup>193</sup> cf *Ora Maritima* 500-504.

within the hinterland of Cataluña and Valencia to the south<sup>194</sup> with the kilns located to supply the coastal economic and population centres such as Dianium, Baetulo, Barcino, Ilerdo and Gerunda (fig. 35).

We can see, therefore, that the location of kilns was dictated by two essential criteria: access to the raw materials required by ceramic production, and by the availability of markets and routes of supply - the provision of the latter negating somewhat the need for the localised provision of raw materials. However, a true understanding of these patterns of supply is dependent upon a definition of the areas of demand satisfied by the production of the kiln. Lamentably little work has been done to define the economic context of ceramic production and the marketing included within. This omission can, I believe, be remedied by an interpretation of the economic horizon within which the kiln operated, both by the identification of structures associated with the kiln and of the range of ceramic artefacts produced there - including not only amphorae, but also other ceramic vessels and construction materials such as bricks and *tegulae*.

The fullest introduction to the forms of ceramic production in the Roman period is that of David Peacock who, on the basis of ethnographic parallels, posited eight modes of production, which, although by no means assured, do provide a useful starting point for further discussion. There are three basic categories of economic production - production for consumption, being purely localised and immediate in usage; a more specialised production for its own sake with the appearance of specific manufactured forms on the basis of demand; production for the exchange of the items for more desirable commodities. These criteria are practically manifested as three economic units: as Household Production - essentially produced to satisfy their own immediate requirements (often the principal productive unit would be the women of the household). Although the scale of the 'industry' can considerably expanded it will, as a rule, remain un-nucleated. Industrial production centred on the exchange of goods for profit; and production by official organisations to supply a specific demand - as

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<sup>194</sup> Castellon has afforded too little evidence of kilns to formulate an hypothesis as to distribution and economic alignment.

exemplified in antiquity by the *annona* and *annona militaris*.<sup>195</sup> Such definitions are readily applicable to the structure of pottery production during the Roman period, but in truth they represent such generalised and widely accepted definitions as to be largely useless. Peacock, therefore, has proposed a more extensive hierarchy of production types: Household Production - Household Industry - Individual Workshops - Nucleated Workshops - the Manufactory - the Factory - Estate Production - Military and other official production.<sup>196</sup>

Household Production is difficult to identify in the ancient world - both as a result of the tendency amongst archaeologists to neglect humbler coarse wares in favour of more 'informative' ceramic types, and the nature of the production itself being primarily sporadic - vessels being produced only when required - and thus not necessitating the provision of elaborate kiln structures that would be detectable within the archaeological record. Some of the wares produced by this means appear to have been distributed over a wider area, such as the Pantellerian wares that turn up at Carthage, and may represent a form of household industry in which professional artisans produce ceramics but as a secondary activity undertaken on sporadic intervals when there is a lull in other primary economic activities. Again the archaeological evidence of this industry is limited as open firing may appear to have been the norm. The scale of activity is in many respects identical to that of individual workshops, the principal differentiation being that ceramic production is the primary means of subsistence. Some specialisation both in terms of pottery types and production methods is likely with, perhaps, the use of both the wheel and the kiln. Although such production will have been orientated towards the satisfaction of a dispersed demand, any large scale market will result in a nucleation of workshops, with access to raw materials and labour also being determining factors in the establishment of nucleated ceramic production. The concentration of workshops in relation to towns may determine the predominately urban character of this production as opposed to the rural basis of individual workshops. The market and redistributive system created by the presence of the town would enable a higher output as well as a greater concentration

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<sup>195</sup> cf Lange, O (1945) "The scope and method of economics" in Rev. Econ. Stud. 13 p 19-32, summarized in Peacock, D P S (1982) op. cit. n. 1 p 7.

<sup>196</sup> cf Peacock, D P S (1982) op. cit. n. 1 p 8-11, 74-151.

upon higher quality wares. The most notable example of this form of manufacture is that of Samian ware produced in South, East and Central Gaul in the First to Third Centuries AD. Although the modes of production of the forms of pottery appear to have been subject to considerable variation, they consist of the grouping of individual potters either in urban or rural contexts, and within locations that in some cases make little or no economic sense although it has been noted that the potteries of South Gaul lie on the Garonne river, of Central Gaul on the Loire and East Gaul on the Rhine and Moselle.<sup>197</sup>

Peacock's classifications of the Manufactory and Factory consist of the grouping of workers into a single specialised production unit. Although the former has analogies with the *Fabrica* of the Late Imperial Period, the scale of operation which characterised the manufactory only came in the period immediately prior to the Industrial Revolution. Factory production requires the use of artificial sources of power which did not come to be utilised until the late Eighteenth Century AD.

One of the principal forms of supply seems to have been through estate production about which much of the rest of this chapter shall be concerned. Although it is possible that ordinary pottery will not have been produced on estates<sup>198</sup>, the manufacture of purely utilitarian vessels, bricks and tiles may have occurred as part of the agricultural requirements of the estate. Although the official supply of ceramics - principally to the army, seems to have been undertaken most commonly by private purchase, military kilns do appear to have been utilised as a source of building materials<sup>199</sup> - as attested by the appearance from the mid First Century AD of bricks stamped with the names of military units. Such materials are unlikely to have been traded over any distance, however, some such movement does seem to have taken place between the military camps along the Rhine. Pottery production is more likely to have remained within the remit of civilian commercial production, although it has been suggested that the incidence of more developed, non-indigenous ceramic forms may have been the consequence of the use of slaves from elsewhere within the Empire to

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<sup>197</sup> cf de la Bedoyere, G (1988) *Samian Ware* (Aylesbury), Oswald, F and Davies Pryce, T (1970) *An introduction to the study of Terra Sigillata* (London).

<sup>198</sup> cf Peacock, D P S (1982) *op. cit.* n. 1 p 10.

<sup>199</sup> cf Vegetius *De Re Militari* 2.11.

operate military kilns.<sup>200</sup> It is, however, impossible to differentiate archaeologically between civilian and military kilns, although ceramic kilns have been found in conjunction with kilns producing building materials for the army, as is the case at Holt in North Wales which produced a variety of materials for the legionary base at Chester.<sup>201</sup> The existence of civilian artisans in the entourage of the army is well known and it is probable that the army left the provision of such resources to market forms - perhaps as an incentive for the supply of other materials by the *Negotiatores* - and some interaction between civilian and military potters may have taken place in the satisfaction of the armies' requirements. As well as the production for or by the army, brick stamps from Rome indicate that by the reign of Diocletian this industry was under Imperial control. Some production may have taken place within the structure of Imperial estates if analogies with estate production are correct.

Peacock's Modes of Production for ceramic goods embrace the various ethnographical and archaeological methods of pottery manufacture, however, as purely utilitarian commercial vessels, amphorae necessitate an alternative pattern of production to that put forward above. Amphora production, as an essentially 'industrial' rather than 'subsistence' process, does not appear to have occurred within the remit of household economies which concentrate upon the manufacture of coarse wares for everyday use. Equally, as Peacock points out, neither the Manufactory or Factory in their strict sense existed in the ancient world. Rather the production of amphorae seems to have occurred through the media of workshops and estates, however, within these modes of production there are a number of variations. Thus amphora production appears to have taken one of four forms:

- i) The production of amphorae on estates in order to satisfy their own immediate demand. As Varro notes, the exploitation of ancillary resources was an accepted feature of estate ownership<sup>202</sup> and the

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<sup>200</sup> cf Greene, K (1977) "Legionary pottery and the significance of Holt" in Dore, J and Greene, K (eds) *Roman Pottery Studies in Britain and Beyond* BAR Int. Ser. 30 p 113-127.

<sup>201</sup> cf Peacock, D P S (1982) op. cit. n. 1 p 139; the original citation is from Grimes, W F (1930) "The works depot of the XXth Legion at Holt" in *Y Cymmrodor* 41, which I regret to have been unable to consult.

<sup>202</sup> Varro *De Re Rustica* i.2.22.

utilisation of the natural resources located on your land seems to have been an acceptable source of revenue.<sup>203</sup> Thus possession of clay beds would result in the establishment of a kiln to supply the estate's ceramic needs as and when needed. Production, therefore, would be small scale, sporadic and unspecialised seeing the manufacture of all essential ceramic items: building materials, domestic pottery, *dolia* and possibly amphorae. Thus in archaeological terms such production is characterised by a wide range of goods produced at sporadic intervals through the operation of the estate as a whole, and the location of the kiln within the area of the estate. Unless we possess epigraphic evidence outlining a particular vessel as having come from a particular estate, archaeologists have been forced to rely upon the geographical siting of the kiln with the obvious problems that that entails in terms of the nature and scale of archaeological investigation. Items produced by this means may well have been traded over long distances but they will have carried the produce of only the original estate. In essence it is the production of amphorae in sufficient quantities to transport the perishable items produced on the estate as a whole. In this regard, the number of amphorae in relation to the other goods manufactured in the kiln would be small, as would be reasonably expected for the range of stamps attested. The definition of such is, however, difficult as the precise relationship between the potter and the estate owner is problematic at best with the former perhaps employed by the latter, or perhaps representing an independent workshop leasing the land from the estate, perhaps in return for a share of the product.

ii) Where the resources are particularly economically viable or unique, we see a larger scale of estate production, perhaps with a greater degree of specialisation in the types of wares produced with scales of demand and distribution now becoming important as the ceramic artefacts from

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<sup>203</sup> We have already noted the desirability of an estate with access to marine resources, cf chapter 1.

the kiln would go to supply the estates located in the immediate vicinity. In terms of structure and evidence there will be little difference between this and the less developed forms of estate production. With the greater demand, operation of the kiln will have been more continuous, although as before, it will not have been the primary economic function of the estate and will have operated principally during slack periods in the agricultural calendar. Similarly with the increased demand, we may see an increased specialisation in the range of forms that were produced on the site. More permanent facilities are also probable with the utilisation of permanent kilns and ancillary structures.

iii) Although production within the estate structure can achieve a scale and specialisation sufficient to be described as an 'industry' - perhaps best exemplified by the production of Dr 20 amphorae within the kilns of the Guadalquivir valley; the differentiation between estate and industrial production of amphorae lies in the principal economic focus of the site. Estates, as noted, are geared towards the satisfaction of non-specialised, subsistence production, an activity that is secondary to their agricultural role. Industrial production on the other hand is the primary activity of the site. Although the location of the potters on estates is possible, their operation will have been independent of that of the estate structure. The range of ceramic forms will have been more specialised than those outlined above being concerned with wares possessing an economic value either as a specialised vessel or as objects of prestige value such as fine wares. Production will not have been dictated by the agricultural calendar and thus, will have been continuous with the corollary that the use of permanent facilities will have been probable if not a necessity. Kilns will have been located primarily in terms of access to routes of communication or directly in relation to urban centres and the market inherent therein. We thus see a wider distribution of goods lacking the localised scatter that is the norm for estate production. A

degree of overlap exists between the centralised manufacture of pottery and the proposition of Paterson<sup>204</sup> that *negotiatores* will have engaged in the bulk purchase of vessels from kilns so as to ship them to points of demand from where they will have been filled and exported.

iv) Within the categories of estate and industrial production outlined thus far, we see the principal forms of independent and dependent amphora production, however, we see a further form of dependent production, namely the manufacture of amphora as part of a wider industrial process. In scale and organisation such potteries will have been little different from the purely localised forms of estate production. The range of forms produced will have been more limited than purely subsistence production, being concerned with the satisfaction of a specific demand for sufficient quantities of vessels required for the production and exchange of a particular commodity rather than supplying the varied demands of an estate. The operation of such kilns, although less subject to the requirements of the calendar, will have operated principally during the fallow months for the wider industrial process undertaken on the site, with the pottery forms themselves having no role, and thus little or no distribution beyond the confines of the industrial complex itself, apart that is, from the vessels used in the exchange of the commodities produced.

We see, therefore, the existence of four types of amphora production: the manufacture of pottery to meet the subsistence demands of the associated villa - essentially non-specialist to meet the immediate local requirements; a more developed form of manufacture is that of the wider estate production of pottery - again primarily subsistence; ceramics produced within these kilns will have been exchanged with estates in the immediate area. With the increased demand, production can be less sporadic and more specialised with a greater concentration upon access to routes of communication

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<sup>204</sup> cf Paterson, J (1982) op. cit. n. 19.

and markets. In essence both categories of production are secondary to the primary agricultural focus of their estates being concerned with their own use and the movement of their own produce. Once the scale of operation is increased, opportunities will arise for the independent production of amphorae and other pottery which will be sold or exchanged with other estates. Such kilns will have produced a limited range of forms to satisfy a more focused demand than that outlined above. Such manufacture constitutes the primary activity of the site which will have functioned principally towards patterns of communication and to market and redistributive centres. Unlike the role of estate pottery production to transport their own produce, industrial production will have been geared towards the production of pottery in its own right which will then have been brought up for use elsewhere - production to transport the commodities of others.

As well as the production of pottery as part of the agricultural economy of *villae*, vessels seem also to have been manufactured as a part of industrial processing, being designed to satisfy the immediate requirements of the production process of the commodity concerned as well as the need to redistribute the resulting product to points of demand. Again this will have been a dependent and secondary activity taking place only to meet the factories' requirements - as with estate production it is essentially the manufacture of vessels for the shipment of your own produce. Although these categories form a reliable indicator of the basic forms of amphora production, one should be aware of the rather more complicated nature of such operations in the ancient economy. There is a considerable degree of overlap between these, somewhat arbitrary, groupings with estate production often achieving a scale and specialisation sufficient to be termed an 'industrial' process. A predominance in the production of a particular commodity may equally result in an alignment of estate production towards specialisation in the vessels utilised by the commerce of the commodity concerned. This is perhaps best seen in the kilns of the Bay of Cadiz which seem deliberately to have concentrated upon the production of Dr 7-11 amphora for use in the fish sauce industry which formed the principal economic focus of the region<sup>205</sup> - seemingly at the expense

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<sup>205</sup> On the production of amphora within the Bay of Cadiz, cf Peacock, D P S (1974) op. cit. n. 100; Campano Lorenzo, A (1994) op. cit. n. 100; Peman, C (1959) "Alfares y embarcaderos Romanos en la

of other forms of ceramic materials such as bricks and *tegulae*. The identification of the economic role of these kilns is, however, difficult to ascertain as they are marked in many cases, merely by the notice of quantities of amphorae sherds without the systematic excavation that is required to quantify the forms of pottery that were produced and the relationship of the kilns to other structures in the immediate vicinity. A fuller picture can be gained from the Guadalquivir valley, where fieldwork has identified large numbers of kilns located along the river between Seville and Cordoba that were engaged in the production of Dr 20 amphorae for the shipment of olive oil produced in the hinterland of the river (fig. 30).<sup>206</sup> The kilns are found located in relation to *villae* lying along the navigable route of the Guadalquivir, however, one should beware of basing too much upon such geographical criteria as it seems rather that the organisation was more complex. Although kilns for the production of coarse ceramic artefacts, particularly building materials, are widespread, sources of higher quality clay for the production of amphorae is less common, leading to a centralisation of production. As Ponsich<sup>207</sup> has already noted, the location of kilns suggests that some were operated by more than one estate - an hypothesis that is borne out by the large number of different stamps that are attested within the sites concerned.<sup>208</sup> The operation of independent workshops is also perhaps attested by the appearance of stamps bearing the names of *figlina*, or workshops. Clearly, however, kilns were also part of the estates of landowners with stamps bearing *tria nomina* pointing to the ownership of kilns by citizens or even members of the Senatorial order<sup>209</sup>, several of

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Provincia de Cadiz" in *AEA* 32 p 169-173; cf also Arteaga, O (1985) "Los Hornos Romanos del Manganeto, Almayate Bajo (Malaga): Informe Preliminar" in *NAH* 23 p 177-189.

<sup>206</sup> cf Ponsich, M (1988) p 17-24, (1974), (1979) op. cit. n. 14; Greene, K (1986) op. cit. n. 1 p 110-114.

<sup>207</sup> cf Ponsich, M (1974) op. cit. n. 14 p 292-3; cf also Greene, K (1986) op. cit. n. 1 p 114.

<sup>208</sup> cf Ponsich, M (1988) op. cit. n. 14 p 24 - more than 500 potters are recorded as operating within 80 kilns.

<sup>209</sup> cf Callender, M H (1965) op. cit. n. 83 n° 1117 a) III MIN // ICIOR and III MINICIOR b) II. MINACRETCN. A tombstone from Cordoba reads P. Minicius Facundus. L. Minicius Apronianus, Iivir, and L. Minicius Natalis Quadronius Verus, Consul and Pro-consul of Africa, are attested at Tarraco and Barcelona (*CIL* ii.2294, 4071, 4510). cf Blázquez Martínez, J M, Remesal Rodríguez, J and Rodríguez Almeida, E (1994) *Excavaciones Arqueológicas en el Monte Testaccio (Roma). Memoria Campaña 1989* (Madrid) n° 251: L(ucius) F(abius) C(ilo) C(larissimus) V(ir) CAT( ), dated to the reign of Elagabalus (AD 218-222). L. Fabius Cilo Catinius Acilianus Lepidus Fulcinianus was Consul and *Praefectus Urbi*, dying in c AD 212. Members of this family are well attested upon Dr 20 amphora as having been involved in the production of olive oil, cf Castillo, C "Big Oil Men from the West" - unpublished paper. cf also Blázquez Martínez, J M, Remesal Rodríguez, J and Rodríguez

whom may have involved themselves in the production of pottery and subsequent marketing of the produce of their estates. Thus it must be borne in mind that the ancient economy was less tied to form and apparent economic logic than its modern equivalent. Purely social considerations seem to have played an important part in the definition of the economic structure of antiquity making the application of modern economic criteria somewhat arbitrary. With these qualifications in mind, therefore, we shall now attempt to apply the four methods of amphora production to that of Eastern Hispania Tarraconensis.

Throughout the Roman period, and in fact until the Industrial Revolution of the Eighteenth Century, the economy remained essentially agrarian, providing little more than structures of production and demand, and not of manufacture. An essential element of this agricultural system was the villa. Unfortunately the definition of this term remains a matter of considerable debate with even the Romans themselves being inconsistent in the criteria they variously applied to the term.<sup>210</sup> There are, however, a number of properties which are most usually associated with the term 'Villa': they are located in the country (although a suburban dwelling could also be termed a *Villa Suburbana*), consisting often of a single dwelling, perhaps of a luxurious character with associated structures of an agricultural nature, or more rarely, an industrial function. More problematic is the degree of Romanization expected of a 'villa' as represented by its planning and architecture. The literary sources choose to describe buildings lacking a Romanised layout in more neutral terms, as *aedificia* (buildings) or *tuguria* (huts). However, the definition of what constitutes a Romanised dwelling is somewhat difficult with often comparatively rudimentary dwellings being classified as *villae* purely on the basis of their possessing a regularised layout. Percival, in his study of the villa of the

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Almeida, E (1994) op. cit.: P( ) M( ) O( ) C(larissimus) V(ir) FIG(lina) EDO(ppiana); n° 281: P( ) M( ) O( ) C(larissimus) V(ir) FIG(lina) PALMA. Further to this it has been suggested that the estate owner and *negotiator*, M. Aemilius Rusticus is related to the Senatorial family of the Messii Rustici, cf Castillo op. cit. p 9-11. The local elite seem also to have been involved, cf esp. the Aeli Optati from Celti, cf Thévenot, E (1952) "Una familia de negociantes en aceite establecida en la Baetica en el siglo II" in *AEA* 25 p 225-231; the Caecilii from Astigi, cf Tchernia, A (1981) "D. Caecilius Hospitalis et M. Iulius Hermesianus" in *Producción y comercio del aceite en la antigüedad. Primer Congreso Internacional* p 155-160. On elite involvement in Spanish trade, cf esp. Haley, E V (1988) "Roman Elite involvement in commerce: the case of the Spanish TT. Mamilii" in *AEA* 61 p 141-156.

<sup>210</sup> For the fullest discussion of the villa, cf Percival, J (1976) *The Roman Villa* (London); Gorges, J G (1979) op. cit. n. 180; Fernandez Castro, M C (1982) *Villas Romanas en España* (Madrid).

Roman world, rightly stresses the problems inherent in defining the nature of the villa as a social and economic unit<sup>211</sup>, and chooses to view such merely in terms of a dwelling *integrated into the social and economic organisation of the Roman world*.<sup>212</sup> Further to this the nature of the ownership of *villae* and their relationship to other sites is difficult to define in some cases where the house is particularly big the villa may have been occupied by more than one family and did not necessarily form a single economic unit and the leasing out of some or all of estates to tenants was commonplace. The Latin word *villa* does, in fact, mean merely a country house with connotations no further than that - a dwelling whose focus was agricultural was termed a *fundus* - however, such a residence requires both investment and thus a source of wealth, and maintenance. Thus they came to acquire extensive estates which could be exploited, their surplus produce going to satisfy the markets afforded by Romanised urban centres. It is in the relationship between *villae* and towns that I believe the definition of the villa to exist.

Although rural in context, the villa is essentially urban in character - being owned by urban-based landowners and the investment thereof, and economic dependant upon the sale of surplus produce in the neighbouring towns. surplus, and investment, being owned by urban-based landowners, intrinsically linked it with the presence of towns. The principal source of revenue for the aristocracy of the Roman world was through the ownership of land - either by the direct exploitation of the land themselves or by leasing it out to others. In fact, to judge by the various agricultural manuals that survive, the provision of a profit was the primary concern. To this end it was considered important to exploit all available resources, although the growing of the vine seems to have been considered the most profitable<sup>213</sup> - the surplus could then be sold in the nearby towns which in turn will have only become possible with the existence of a sufficient agricultural surplus to maintain a largely dependant population. The presence of such markets and the burden of taxation will have acted as a further

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<sup>211</sup> cf Percival, J (1976) op. cit. n. 210 p 13-15.

<sup>212</sup> cf Percival, J (1976) op. cit. n. 210 p 15, following Rivet, A L F (ed.) (1969) The Roman Villa in Britain p 177.

<sup>213</sup> cf Columella RR iii.3.

incentive to the production and sale of goods.<sup>214</sup> The provision of good communications so as to facilitate the exchange of goods from one's estate was a major concern for the Roman landowner: Cato lists access to such communications amongst his criteria for the acquisition of a farm; it should be an appealing location, with a good climate and soil, lie on a southward facing slope, a healthy location, a good supply of labourers, it should be well provided with utilities, have been in the possession of a long-serving farmer and lie near a flourishing town, the sea or a navigable river or well-used road<sup>215</sup> - clearly such criteria were of considerable importance in the establishment of *villae*. Thus the villa served as an object of investment on the part of absentee landlords who utilised them as a source of revenue through the sale of surplus production in order to maintain a predominantly urban lifestyle. It is in this dependence upon urban centres and their role as an object of aristocratic investment that they differ chiefly from purely agricultural dwellings or *fundi*. *Villae*, therefore, came to possess extensive estates which seem to have included not only other *villae*, but also 'small-towns' (or *vici*) and native (ie non-Romanised) settlements, however, the definition of the extent of estates and the relationship between settlements included therein remains problematic within the archaeological record.. The presence of large *villae* as well as smaller dwellings may point to the latter being dependent upon the former whilst structural similarities may also provide an indication of such.<sup>216</sup> Although Percival is able to cite the villae at Chiragan (Hte-Garonne) and Montmaurin as evidence for the scale of estates<sup>217</sup>, I can cite no comparable evidence for such in Hispania Tarraconensis.<sup>218</sup>

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<sup>214</sup> On the encouragement of trade by the need to pay taxation, cf Hopkins, K (1980) "Taxes and trade in the Roman Empire" in *JRS* 70 p 101-125.

<sup>215</sup> Cato *De Agri Cultura* 1.1-4: *Praedium quom parare cogitabis, sic in animo habeto, uti ne cupide emas neve opera tua parcas visere et ne satis habeas semel circumire. Quotiens ibis, totiens magis placebit quod bonum erit. Vicini quo pacto niteant, id animum advertito: in bona regione bene nitere oportebit. Et uti eo introeas et circumspicias, uti inde exire possis. Uti bonum caelum habeat, ne calamitosum siet, solo bono, sua virtute valeat. Si poteris, sub radice montis siet, in meridiem spectet loco salubri, operariorum copia siet, bonumque aquarium, oppidum validum prope siet aut mare aut amnis, qua naves ambulant, aut via bona celebrisque. Siet in his agris, qui non saepe dominos mutant: qui in his agris praedia vendiderint, eos pigeat vendidisse. Uti bene aedificatum siet.* cf also Pliny *Letters* 2.17.

<sup>216</sup> cf Percival, J (1976) op. cit. n. 210 p 122-123.

<sup>217</sup> cf Percival, J (1976) op. cit. n. 210 p 123-124.

<sup>218</sup> The identification of centuriation provides what little evidence we possess for land use, although this pertains only to urban centres with villae being peripheral, cf Ariño Gil, A (1986) *Centuriaciones*

Columella divides the villa into three parts: the *villa rustica*, *fructuaria* and *urbana* - farming, storage and residence.<sup>219</sup> Although the excavation of *villae* within Spain has, until recently, concentrated on the *villa urbana*, the primary criteria for the establishment of such dwellings seems to have been agricultural - although this does not preclude the existence of purely residential *villae*, such as Villa Fortunatus (Fraga) (pl. 23) and the lavish Fourth Century villa at Centcelles (Constantí) - which may have served as the mausoleum for the emperor Constans (fig. 32).<sup>220</sup> The establishment of *villae* within the Peninsula goes in parallel with the spread of Romanization and the growth of towns and the market thereof<sup>221</sup> with *villae* established in the coastal plains of NE Tarraconensis in the Second Century BC and by the Augustan period in the Guadalquivir valley. They are concentrated within the fertile low-lying coastal plains and with rivers, the sea or roads, most importantly the *Via Augusta*, providing access to the markets afforded by the population centres along the coast. This economic dependency on the town and the ideal of self-sufficiency meant that the financial return was a primary concern. Thus Cato viewed the profitability of farming as the most assured source of revenue and lists the various crops in order of profitability.<sup>222</sup> Varro,

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Romanas en el Valle Medio del Ebro (Logroño); Santos Velasco, J A (1994) "City and State in Pre-Roman Spain: the example of Illici" in *Antiquity* 68 p 289-299.

<sup>219</sup> Columella *RR* 1.6.1: *Modus autem membrorumque numeros aptetur universo consaepto et dividatur in tres partes: urbanam, rusticam, fructuariam.*

<sup>220</sup> cf Hauschild, T and Schlunk, H (1961) "Vorbericht über die Arbeiten in Centcelles" in *MM* 2 p 119-182; Galiay, J (1943) "Los mosaicos de Fraga en el Museo de Zaragoza" in *AEA* 16 p 227-230; Gorges, J G (1979) op. cit. n. 180; on the agricultural role of villae in Spain, cf Aguilar Saenz, A (1991) "Dependencias con funcionalidad agrícola en las villas romanas de la Península Ibérica" in *Alimenta. Homenaje al Dr Michel Ponsich Anejos de Gerion III* p 261-279.

<sup>221</sup> The Romanisation of the Peninsula is a topic in its own right and shall not delay us here. The reader is referred to Blázquez Martínez, J M (1963) "El impacto de la conquista de la Hispania Romana en Roma (154-83 aC)" in *Klio* 41 p 168-186; Keay, S J (1992) "The Romanisation of Turdetania" in *OJA* 11.3 p 275-315; Richardson, J S (1986) *Hispaniae. Spain and the development of Roman imperialism, 218-82 BC* (Cambridge); Curchin, L C (1991) *Roman Spain: conquest and assimilation* (London); Tsirkin, Ju B (1989) "The veterans and the Romanisation of Spain" in *Gerion* 7 p 137-147; Tsirkin, Ju B (1993) "Romanisation of Spain: socio-political aspect (II). Romanisation in the period of the Republic" in *Gerion* 11 p 272-312. cf also Haley, E W (1991) *Migration and Economy in Roman Imperial Spain Aurea Saecula 5* (Barcelona); Marin Diaz, Ma A (1988) *Emigración, Colonización y Municipalización en la Hispania Republicana* (Granada).

<sup>222</sup> Cato *De Agri Cultura* 1.4: *At ex agricolis et viri fortissimi et milites strenuissimi gignuntur, maximeque pius quaestus stabilissimusque consequitur minimeque invidiosus, minimeque male cogitantes sunt qui in eo studio occupati sunt.* "On the other hand, it is from the farming class that the bravest man and the sturdiest soldiers come, their calling is most highly respected, their livelihood is most assured and is looked on with the least hostility, and those who are engaged in that pursuit are least inclined to be disaffected." (trans. Loeb ed.) *De Agri Cultura* 1.7: *Praedium quod primum siet, si me rogabis, sic diam: de omnibus agris optimoque loco iugera agri centum, vinea est prima, si vino*

on the other hand, speaks of the high profits that can be gained from the farming of specialist crops on estates lying close to towns.<sup>223</sup> Columella, however, as we have referred to above, states that the vine is the most profitable crop.<sup>224</sup> The Younger Pliny in a letter to Calvisius Rufus<sup>225</sup> seeking advice concerning the purchase of a property adjoining his estates at Comum, speaks of the value of the estate not only because of the ease in grouping his properties, but because of the rich and fertile soils with fields, vineyards and woods from which a consistent if not a large yield can be gained. This picture of a productive estate is typical of those excavated in recent years from the Iberian Peninsula.

The villa at Liedena (Navarra), dated to the Second to Fourth Centuries AD, consists of a peristyle dwelling with an associated bath complex and to the south-west of the principal house are found a number of agricultural buildings including a wine press and associated *dolia* as well as an area for pressing olives (pl. 24).<sup>226</sup> The villa of Nuestra Señora de la Salud, Sabadell dates from the First to Third Centuries AD. Little work has been done on the residential quarters of the villa although a building consisting of an enclosed courtyard with 68 *dolia* arranged in six lines has been found.<sup>227</sup> Similarly the fourth and fifth phases of the villa at Vilauba dated to the Fourth Century AD see the abandonment of parts of the central villa in favour of an increased specialisation in the processing of the olive. The final phase of construction on the site sees the erection of an olive processing plant consisting of three rooms: the first for the preparation of the olives, the second for the pressing of the olives and their initial decantation into an adjoining cistern, the third used for the storage of the *dolia* used in

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*bono et multo est, secundo loco hortus inriguus, tertio salictum, quarto oletum, quinto pratum, sexto campus frumentarius, septimo silva caedua, octavo arbustum, nono glandaria silva.* “If you ask me what is the best kind of farm, I should say: a hundred *iugera* of land, comprising all sorts of soils, and in a good situation; a vineyard comes first if it produces bountifully wine of a good quality; second, a watered garden; third, an osier-bed; fourth, an oliveyard; fifth, a meadow; sixth, grain land; seventh, a wood lot; eighth, an *arbustum*; ninth, a mast grove.” (trans. Loeb ed.).

<sup>223</sup> cf Varro *Re Rustica* 3.2.16.

<sup>224</sup> Columella *De Re Rustica* 3.3.

<sup>225</sup> Pliny *Epistulae* 3.19.

<sup>226</sup> cf Aguilar Saenz, A (1991) op. cit. n. 220 p 265-266.

<sup>227</sup> cf Moral Romeu, E and Llobet, E (1976) “Algunas notas sobre las excavaciones de la Salut” in *Información Arqueológica* 20-21 p 61; cf also Aguilar Saenz, A (1991) op. cit. n. 220 p 269-270.

the bottling of the olives.<sup>228</sup> The villa at La Font del Vilar is typical of the descriptions given by the ancient literary sources (**fig. 33**). It is located to the NW of the hinterland of the Graeco-Roman centre of Empúries and was the object of two seasons of excavations in 1991 and 1993.<sup>229</sup> The villa consists of a range of buildings around a central courtyard; the west range appears to have constituted the principal dwelling, perhaps consisting of two floors with poorly preserved remains of *opus signinum*. To the north of this building a small bath-house was built in the Second Century AD. On the opposite side of the courtyard from the *villa urbana* are the parts of the villa devoted to agricultural use: to the North is a large storehouse (26x8 m) which contained between 40 and 45 *dolia* as well as a tank lined with *opus signinum* used in the decantation of the liquid concerned, presumably wine. To the South of this are three further structures, the best preserved of which includes a cistern from which a drain seems to have been used for the filling of vessels. The estate as a whole was located both on the *Via Augusta*, on the upper reaches of the R. Manol and with access via secondary roads to the port of Empúries - it seems a reasonable supposition, therefore, that the wine production of the estate was geared to satisfying the demand of the coastal centres. The villa lies on rich, fertile soils, surrounded by woodland and it is probable that the activity of the estate was not limited to the vine. Perhaps most significant from the point of view of this thesis are the finds of large quantities of shells, above all of oysters, which suggest that prior to the abandonment of the site in the Fifth Century AD, the preservation of marine molluscs took place with them being kept alive

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<sup>228</sup> cf Roure i Bonaventà, A, Castanyer i Masoliver, P, Nolla i Brufau, J M, Keay, S J and Tarrus i Galter, J (1988) *La Villa Romana de Vilauba* (Girona); Jones, R F J, Keay, S J, Nolla, J M and Tarrus, J (1982) "The Late Roman Villa of Vilauba and its context. A first report on field-work and excavation in Catalunya, North-East Spain 1979-1981" in *AJ* 62 p 245-282; Castanyer i Masoliver, P and Tremoleda i Trilla, J (1995) "La Villa de Vilauba: resultados de las últimas campañas de excavación (1990-1993)" in *JRA* 8 p 275-277; Aquilué, X (1992) "Nuevas publicaciones sobre el poblamiento rural en el nordeste de la Tarraconensis" in *JRA* 5 p 378-385; Tremoleda, J, Castanyer, P and Roure, A (1989) "Vilauba: estudi preliminar del larari de la villa" in *Cypsela* 7 p 49-69; Castanyer, P, Roure, A and Tremoleda, J (1991) "Estudi d'un conjunt ceràmic de finals del segle III dC a Vilauba (Camos, Pla de l'Estany)" in *Cypsela* 8 p 157-191; Roure, A, Tremoleda, J and Castanyer, P (1989) "Trobada d'un conjunt monetari a Vilauba" in *Empúries* 48-50, 2 p 268-281.

<sup>229</sup> cf Tremoleda, J, Casas, J, Castanyer, P and Nolla, J Ma (1995) "El asentamiento rural de La Font del Vilar (Avinyonet de Puigventós, Gerona)" in *JRA* 8 p 271-274; Tremoleda, J and Castanyer, P (1992) "Excavació de salvament a la villa romana de La Font del Vilar (Avinyonet de Puigventós) in *I Jornades d'Arqueologia de Girona* (Sant Feliu de Guíxols) p 117-124; Tremoleda, J and Castanyer, P (1993) "La Font del Vilar, Avinyonet de Puigventós" in *Anuari d'intervencions arqueològiques a Catalunya. Època Romana. Antiguitat Tardana. Campanyes 1982-1989* (Barcelona).

in sea water prior to preservation in vinegar for shipment inland, although this explanation does not, I believe, adequately explain the difficulties inherent in the presence of marine molluscs on this inland site. Apicius<sup>230</sup> does, however, refer to the preservation of oysters in vinegar and the exchange of fish and molluscs in barrels of sea water is also attested<sup>231</sup>, although evidence for such is lacking.

Evidence is plentiful elsewhere within the region for an agricultural role for the *villae*. Located only five kilometres from Empúries is the villa of Tolegassos (Viladamat, Girona). The site seems to have undergone seven phases of occupation between the Second Century BC and the Fourth Century AD. The villa seems to have engaged in arable farming with the discovery of a large store house containing 125 *dolia*: carbonised cereal grains have been found in several levels of the site and stock breeding may also have played an important role in the economy of the villa with sheep/goat and cattle bones having been identified.<sup>232</sup>

A similar correlation between the exploitation of the land and sea can be seen in the excavated remains of the villa adjoining the Baños de la Reina at Calpe (**fig. 11-12**). The site was originally excavated in the Eighteenth Century by the antiquarian Antonio Jose Cavanilles<sup>233</sup>, with further excavations being undertaken by M. Pellicer in 1965 which dated the site to the Second to Fourth Centuries AD and revealed quantities of agricultural machinery which raise as yet unanswered questions as to the relationship between the constituent components of the villa's economy.<sup>234</sup>

This agricultural basis seems to have been the norm for the *villae* of the region with the production of wine, olive oil and cereal crops being attested, often on the same estate.<sup>235</sup> Other resources, where available, were also exploited - we have already

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<sup>230</sup> Apicius *De Re Coquinaria* 1, 12.

<sup>231</sup> cf Ferdière, A (1988) *Les Campagnes en Gaule Romaine 2. Les techniques et les productions en Gaule rurale* (Paris) p 186.

<sup>232</sup> cf Casas i Genover, J (1995) "La villa de Tolegassos (Viladamat, Girona)" in *JRA* 8 p 278-283; Casas, J and Nolla, J Ma (1989) "Un conjunt tancat amb ceràmica africana a la villa romana del Tolegassos (Viladamat, Alt Empordà) in *Empúries* 48-50 p 202-213.

<sup>233</sup> cf Cavanilles, A J (1795) *Observaciones sobre la Historia Natural, Agricultura, Poblacion y Frutos del Reyno de Valencia* (Zaragoza) p 289-297.

<sup>234</sup> cf Gorges, J G (1979) *op. cit.* n. 180 p181.

<sup>235</sup> The production of wine, olive oil and cereal crops etc. within the region are beyond the scope of this thesis. A large number of sources refer to the wines of the region: the Elder Pliny praises the quality of Laietanian wine and says that those of Lauro and Tarraco were of a higher standard (*NH* 14.71); Martial speaks of *faex Laietana* (1.26.9) although he judges the wine of Tarraco to be

referred to the profitability of marine resources - and clay deposits seem to have been included within this with diversification and self-sufficiency being a primary concern; Varro advises that nothing should be purchased which can be made on the farm<sup>236</sup> and he makes his speaker, Scrofa state that a variety of crops should be grown to make best use of the available land.<sup>237</sup> Evidently any resource available should be exploited both

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comparable to that of Campania (13.118). Juvenal criticises the wine from Saguntum, whilst Ovid tells us that Spanish wine was only good for drugging servants and was not included in Caesar's banquet to celebrate his Spanish triumph. Silius Italicus describes Tarraco as a *land of vines, which allows precedence to no vintage but that of Latium* (3.369), whilst Florus (2.2) also refers to the vineyards of Tarraco. For the production and exchange of wine the reader is referred to Beltrán Lloris, M (1987) op. cit. n. 35; Blázquez Martínez, J M (1968) "Exportacion e Importacion en Hispania a final de la Republica Romana y durante el gobierno de Augusto, y sus consecuencias" in Anuario de Historia Economica y Social 1 p 37-84; Blázquez Martínez, J M (1973) "Economía de la Hispania Romana Republicana" in Hispania 33 p 205-247; Blázquez Martínez, J M (1978) Economía de la Hispania Romana (Madrid); Comas i Sola, M (1987) "Importacio i Exportacio de vi a Baetulo: l'estudi de les amfores" in El Vi a l'Antiguitat: Economia, Produccio i Comerc al Mediterrani Occidental Actes I Colloqui d'Arqueologia Romana (Museo de Badalona) Monografies Badalonines n. 9 p 161-173; Garcia-Bellido, M P (1986) "Nuevos documentos sobre minería y agricultura romana en Hispania" in AEA 59 p 13-46; Keay, S J (1987) "La Importacion de vino y aceite en la Tarraconense Oriental en la Antigüedad" in El Vi a l'Antiguitat: Economia, Produccio i Comerc al Mediterrani Occidental Actes I Colloqui d'Arqueologia Romana (Museo de Badalona) Monografies Badalonines n. 9 p 383-395; Miró i Canals, J (1988) op. cit. n. 22; Pascual Guash, R (1984) "The Catalan Wine Trade in the Roman Empire" in IJNA 13 p 245-248; Tchernia (1971) op. cit. n. 24; Tchernia, A and Zevi, F (1972) op. cit. n. 26. Oil production is less well attested, seemingly unable to acquire a market against the domination of Baetican and N. African production. Avienus De Ora Maritima v.505 appears to refer to the R. Ebro as an *oleum flumen* as well as to olives at Valencia (v.494). Prudentius refers to oil from Caesaraugusta (cf Passio xviii. Mart. Caesaraug., 4, 54: *verticum flavis oleis revincta*). cf Beltrán Lloris, M (1980) "El comercio del aceite en el valle del Ebro a finales de la Republica y comienzos del Imperio Romano" in Produccion y comercio de aceite en la Antigüedad. Primer Congreso Internacional p 187-224; Keay, S J (1983) "The import of olive oil into Catalunya during the Third Century AD" in Produccion y comercio de aceite en la Antigüedad. Segundo Congreso Internacional p 551-568.

<sup>236</sup> Varro De Agri Cultura 1.22.1-2: *De reliquo instrumento muto, in quo sunt corbulae, dolia, sic aut, haec praecipienda. Quae nasci in fundo ac fieri a domesticis poterunt, eorum inquit ematur, ut fere sunt quae ex viminibus et materia rustica fiunt, ut corbes, fiscinae, tribula, valli, rastelli; sic quae fiunt de cannabi, lino, iunco, palma, scirpo, ut funes, restes, tegetes. Quae e fundo sumi non poterunt, ea si empta erunt potius ad utilitatem quam ob speciem, sumptu fructum non exentuant; eo magis, si inde empta erunt potissimum, ubi ea et bona et proxime et vilissimo emi poterunt.* "With regard to the rest of the equipment - 'the mute', a term which includes baskets, jars and the like - the following rules may be laid down: nothing should be brought which can be raised on the place or made by the men on the farm, in general made of withes and of wood, such as hampers, baskets, threshing sledges, fans, and rakes; so too articles which are made of hemp, flax, rush, palm fibre, and bulrush, such as ropes, cordage and mats. Articles which cannot be got from the place, if purchased with a view to utility rather than show, will not cut too deeply into the profits; and the more so if care is taken to by them where they can be had of good quality, near by and at the lowest prices." (trans. Loeb ed.).

<sup>237</sup> Varro De Agricultura 1.23.1-2: *Scrofa, Quoniam fructum, inquit, arbitror esse fundi eum qui ex eo satus nascitur utilis ad aliquam rem, duo consideranda, quae est quo quidque loco maxime expediat serere. Alia enim loca apposita sunt ad faenum, alia ad frumentum, alia ad vinum, alia ad oleum, sic ad pabulum quae pertinent, in quo est ocinum, farrago, vicia, medica, cytisum, lupinum. Neque in pingui terra omnia seruntur recte neque in macra nihil.* "Since I hold', continued Scrofa, ' that the profit of the farm is that which arises from it as the result of planting for a useful purpose, two items

to supply the estate and for profit - it is not surprising, therefore, to see the establishment of kilns on estates where clay deposits were found.

At the most basic level this will have consisted of an *ad hoc* exploitation of a clay deposit to supply the non-specialist ceramic requirement of the villa. The production of building materials does not require any specific quality of clays or methods of manufacture and it seems likely that wherever possible *villae* will have met their own needs in this regard.<sup>238</sup> Often such activities will not have required permanent kilns and thus leave no traces in the archaeological record beyond scatters of ceramic wasters. Where permanent kilns were used there must have been a tendency to market the ceramic products thereof to neighbouring estates, particularly if the clay deposit was particularly rich. Examples of this activity are, therefore, scarce and are further complicated by the accident of archaeological discovery. The kiln found at La Torrassa (Vall de Uxó), although dated only most generally to the Roman period, seems to have been engaged in the production of coarse pottery types for local use.<sup>239</sup> A substantial villa has been excavated at Cal Ros de les Cabres (Ocata-El Masnou, Maresme) with lavish mosaics and evidence of occupation from the Late Republic - Late Empire. Excavations undertaken in 1984 revealed a kiln producing Pascual 1 amphorae of which 19 pivots, 11 handles and various other sherds have been recovered. Only two stamps have been identified: a circular stamp with radiate decoration; and a mark bearing the letter L.<sup>240</sup> It is striking that such an important villa has not produced evidence of continued production of Dr 2-4 amphorae. Evidently the demands of the villa and the surplus production was sufficient to merit the provision of a kiln, although this was perhaps not sufficiently economic, leading to a decline in amphora production in the early First Century AD. Two kilns have been identified within phase III B of the

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are to be considered: what it is most expedient to plant and in what place. For some spots are suited to hay, some to grain, others to vines, others to olive, and so of forage crops, including clover, mixed forage, vetch, alfalfa, snail clover, and lupines. It is not good practice to plant every kind of crop on rich soil, nor to plant nothing on poor soil..." (trans. Loeb ed.).

<sup>238</sup> On the production of brick and tile, cf McWhirr, A (ed.) Roman Brick and Tile: Studies in manufacture, distribution and use in the Western Empire BAR S. 68 (Oxford).

<sup>239</sup> cf Alcina Franch, J (1946) op. cit. n. 33.

<sup>240</sup> cf Jarrega, R (1987) "Un possible taller i una nova estampilla amforal de la Villa Romana de les Cabres (Ocata-El Masnou, Maresme)" in El Vi a l'Antiguitat: Economia, Produccio i Comerç al Mediterrani Occidental Actes I Colloqui d'Arqueologia Romana (Museo de Badalona) Monografies Badalonines n. 9 p 246-249.

villa at Puig Rodon (Corçà, Baix Empordà) dated by finds of *Africana C* and *D* and *Terra Sigillata Lucente* to the final quarter of the Fourth Century and the first half of the Fifth Century AD. These kilns seem to have supplied the villa during the third and fourth phases of occupation<sup>241</sup> and are located over the centre of the pre-existing courtyard. They seem to have produced principally coarse wares and amphorae, not for use beyond the estate.

Allowing for the problems in identifying such production it would appear that many estates possessed kilns in order to satisfy their own immediate ceramic requirements. However, although no specialisation in either clay or expertise is required for basic coarse ware products such as *tegulae*, the finer the product the higher the grade of clay required - and thus more limited in availability. Further to this, not all estates will have possessed even the most basic clay deposits and economic forces will have encouraged those that did, or who had invested in permanent kilns to increase their return by marketing their goods to less fortunate neighbours. Thus there is a concentration of ceramic production into the hands of a smaller number of estates than would initially appear to have been the case. Thus in Marta Prevosti's survey of the sites in the hinterland of the towns of Baetulo and Iluro, 264 *villae* and possible *villae* were identified with only 10 kilns.<sup>242</sup> A number of estates, therefore, possessing clay deposits of a higher quality or more readily available, seem to have been able to exchange ceramic products with neighbouring estates. The range of products, the sporadic and secondary nature of the activity will have differed little from the above but the greater economic potential must have encouraged the establishment of permanent kilns whilst a greater range of vessel types and stamps can also be posited.

Three kilns for the production of amphorae have been found within a substantial villa complex at Torre Llauder (Mataró, Barcelona) (**fig. 36**).<sup>243</sup> The villa seems to have

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<sup>241</sup> cf Nolla i Brufau, J Ma and Casas, J (1990) "El material ceramic d'importació de la villa romana de Puig Rodon (Corçà, Baix Empordà), d'època severiana a la Baixa Antiguitat" in *Cypsela* 8 p 203.

<sup>242</sup> cf Prevosti, M (1991) op. cit. n. 168 p 135-7.

<sup>243</sup> cf Ribas, M (1963) *La Villa Romana de Torre Llauder de Mataró* EAE 47 (Madrid); Prevosti, M (1995) "La Villa Romana de Torre Llauder (Mataró, Barcelona)" in *JRA* 8 p 292-297; Prevosti, M and Clariana, J F (1987) "El Taller de anforas de Torre Llauder: nuevas aportaciones" in *El Vi a l'Antiguitat: Economia, Producció i Comerç al Mediterrani Occidental* Actes I Colloqui d'Arqueologia Romana (Museo de Badalona) Monografies Badalonines n. 9 p 199-210; Miró i Canals, J (1988) op. cit. n. 22 p 37-40.

been built in the final decade of the First Century BC, although the main dwelling seems to have been begun during a second phase of occupation in the Augustan period, reaching its peak during the Severan period with the construction of a series of elaborate polichrome mosaics in the central atrium of the house. Further indications of wealth are evidenced by the finds of marble sculpture and wall-paintings. At some point during the Fourth Century AD these rooms seem to have been converted into a press and storeroom for *dolia* with perhaps a Christian basilica also being built on the site. As well as the agricultural activities referred to above, the villa seems to have served a number of other economic roles with the discovery of four glass kilns to the NE of the main residential area. Excavations undertaken between 1981 and 1985 revealed three kilns each consisting of two rectangular firing chambers parallelling those found at Sant Martí Sarroca, La Salut and Sant Boi de Llobregat.<sup>244</sup> As we have referred to above, this form of kiln is often associated with the manufacture of brick and tile<sup>245</sup>, although Duhamel<sup>246</sup> has shown that in Gaul these kilns were used in the manufacture of Terra Sigillata and coarse wares. Those at Torre Llauder, however, seem to have been used almost exclusively in the manufacture of amphorae.<sup>247</sup> The kilns seem only to have been in operation in the Augustan period - early First Century AD with a predominance of Pascual 1 over Dr 2-4 forms although fragments of Dr 6, 9 and 20 amphorae have also been found.<sup>248</sup> What is most striking about the vessels attested from Torre Llauder are the large range of stamps attested: 30 stamps with letters, 3 with signs and 12 graffiti. Pascual<sup>249</sup> cites the stamps L. HER OP, B, BP, AS, CLV, SEC and AT as being present in sufficient quantities to explain a local origin. In this, Torre Llauder is typical of the kilns of Eastern Tarraconensis in its production of a wide range of stamps<sup>250</sup> and

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<sup>244</sup> cf Prevosti, M and Clariana, J F (1987) op. cit. n. 243 p 199; cf also Fletcher Valls, D (1965) op. cit. n. 172.

<sup>245</sup> cf McWhirr, A (1982) *Roman Crafts and Industries* (Aylesbury) p 33; Swan, V G (1984) op. cit. n. 171 p 83-85. The use of rectangular kilns may also reflect a military involvement, having been associated with military supply in Britain, the Rhine provinces and Pannonia - as this is manifestly not the case here, this argument shall not detain us.

<sup>246</sup> cf Duhamel (1974) p 62.

<sup>247</sup> Almost no fine wares have been found - forms Mayet XX, Mayet IV, an imitation of Arretine ware and a fine ware of 'egg-shell' type.

<sup>248</sup> cf Ribas, M (1963) op. cit. n. 243 p 33.

<sup>249</sup> cf Pascual Guash, R (1977) op. cit. n. 29 p 64.

<sup>250</sup> The 10 kilns identified by Prevosti in the area between the R. Besós and Arenys produced 56 different stamps, cf Prevosti, M and Clariana, J F (1987) op. cit. n. 243 p 202.

it seems probable that the kilns served to supply the needs not only of their own estate but of those in the vicinity as well. As we shall aim to show in the subsequent section, the appearance of *tria nomina* means that these stamps represent not the employment of a number of potters at Torre Llauder but rather the production of vessels for a variety of different estate owners. Significant in this regard is the frequent appearance of stamps of L. HER(ennius) OP(tatus) within the finds of the excavations of M. Ribas.<sup>251</sup> That Herennius Optatus was a local landowner, perhaps even directly involved in Torre Llauder itself, may be envisaged. On a Dr 2-4 vessel is found the stamp CLV which is more commonly attested on Pascual 1 and Dr 2-4 amphorae produced at Punta del Morrell<sup>252</sup> and is also found at Baetulo.<sup>253</sup> Unlike Torre Llauder, production at El Morrell concentrated upon that of Dr 2-4 amphorae, and it is possible that CLV shifted his supply of ceramics to the latter with the apparent cessation of amphora production at Torre Llauder in the early First Century AD. At this point the excavated amphora kilns went out of use, although it is possible that other kilns elsewhere on the site were used - the reasons for this change considering the later agricultural activity on the site is unclear. As regards the scale of production at Torre Llauder, Prevosti<sup>254</sup> has calculated that each of the ten wine amphora kilns supplied a cultivated area of c7 km<sup>2</sup>, or 2800 *iugera*. Following Carandini she has suggested that only 30 %, or 840 *iugera*, of the total area can have been devoted to vine cultivation, the rest being given over to other subsistence crops. Such an area would require 14,076 amphora p.a., which according to Gaius<sup>255</sup> will have needed four ships to transport. Each of the kilns at Torre Llauder will have been able to fire, at most, 220 amphorae, and if fired every two weeks each will have produced 5,720 amphorae p.a., or a total production of 17,160 amphorae p.a., clearly more than adequate to meet the demands of the estates of the immediate vicinity. It seems a reasonable supposition, therefore, that estates such as Torre Llauder acted as *emporía* for the surrounding agricultural production, both producing amphora and redistributing those from

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<sup>251</sup> cf Ribas, M (1963) op. cit. n. 243 p 29-30.

<sup>252</sup> cf Pascual Guash, R (1981) 'Les Marques Amforiques CLV i CHR' in Laietania: Estudis d'Arqueologia del Maresme (Museo Municipal de Mataró) p 197-199.

<sup>253</sup> cf Miró i Canals, J (1988) op. cit. n. 22 p 38.

<sup>254</sup> cf Prevosti, M and Clariana, J F (1987) op. cit. n. 243 p 200-201.

<sup>255</sup> Gaius Institutes I,32.

elsewhere in the vicinity - as may be evidenced by the case of CLV. This external focus is borne out by the location of kilns in the area, either in relation to waterways - the sea or major rivers, or the road network.<sup>256</sup> They appear to have served a function similar to that of entrepôts such as Baetulo, with the grouping of kilns around such centres as well as upon road heads such as Caldes de Montbui enabling the shipment of amphorae and their provision to neighbouring estates.

The presence of wine (as evidenced by the finds of *dolia*) and of glass working as well as ceramic kilns reflects the secondary role of pottery production at Torre Llauder, as does the range of products, including both amphorae and coarser ceramic products such as *tegulae*. As we have seen, the lack of specialised amphora production in Tarraconensis seems to have been widespread. The most important site pertaining to the production of Dr 7-11 amphorae appears to be the kiln site at L'Aumedina, Tivissa<sup>257</sup> where two kilns have been identified<sup>258</sup>, producing Pascual 1, Dr 2-4, Oberaden 74 and Dr 7-11 amphora forms, coarse pottery, *dolia* and building materials - *tegulae* and *imbrices* (fig. 37). Similarly, the three kilns excavated at Carrer d' Isaac Peral 38, Llafranc produced Pascual 1, Dr 2-4 and Dr 7-11 amphorae, coarse pottery and building materials.<sup>259</sup> The correlation between amphora production and other agricultural activities, as with the smaller scale production outlined earlier, seems still to have been important - note the incidence of a wine press 25 m to the south of the kilns at L'Aumedina (fig. 38).<sup>260</sup> The press forms part of a dwelling covering an area of c 90m<sup>2</sup> that contains both the remains of the press and two large deposits lined with *opus signinum* for storing liquids. Further deposits as well as quantities of *dolia* were found during the excavation of the site in 1978. The complex is dated to the First to Fourth

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<sup>256</sup> For the relationship between roads and kilns in the South, cf Peman, C (1948) "Nuevas precisiones sobre las vias Romanas en la Provincia de Cadiz" in *AEA* 21 p 255-268; cf also Peman, C (1959) op. cit. n. 205.

<sup>257</sup> cf Revilla Calvo, V (1993) op. cit. n. 76; Tchernia, A (1976) op. cit. n. 190; Miró i Canals, J, Pallares i Comas, R and Garcia Alonso, F (1987) "Una aportacion al conocimiento de la produccion anforica Romana en Tarragona. El horno de l'Aumedina, Tivissa (Ribera d'Ebre, Tarragona)" in *CPAC* 13 p 275-287.

<sup>258</sup> A third kiln is hypothesised but no evidence for this has been found, cf Revilla Calvo, V (1993) op. cit. n. 76 p 41-42.

<sup>259</sup> cf Barti Catala, A and Plana Mallart, R (1993) op. cit. n. 46.

<sup>260</sup> cf Revilla Calvo, V (1993) op. cit. n. 76 p 46-49.

Centuries AD on the basis of comparison with the oil press at Vilauba.<sup>261</sup> It is probable that the amphora produced bearing the stamp TIBISI will have been used to ship the wine produced here.<sup>262</sup> The range of stamps attested from the site are more limited than those from Torre Llauder, being concentrated upon those of SEX.DOMITI and TIBISI. Some local exchange may have existed or the movement of either vessels or contents may have taken place on the basis of the preservation of a *dolium* bearing the stamp TIBISI in the Dpto. de Prehistoria, Historia Antigua, Arqueología at the Universidad de Barcelona, although the exact provenance of this piece is unknown.<sup>263</sup> The grouping of kilns and the apparent isolation of Tivissa from other production sites may further support the use of kilns to satisfy ceramic demands of the immediate vicinity.

The clustering of kilns seems to have been commonplace with a number of sites possessing two or more<sup>264</sup>, however, no site has produced evidence of specialisation as we see elsewhere, for example at Corneilham, and the scale of these complexes remain small - that of L'Aumedina covers only 1,500 m<sup>2</sup>, equivalent only to the smallest potteries in Baetica and Narbonensis. This, together with the lack of specialisation would, therefore, tend towards the concentration of ceramic production in a number of estates which will have sold their surplus production to meet the requirements of neighbouring estates, thus acting as centres of distribution and exchange in a manner not unlike that of urban centres such as Baetulo and Dianium. That a grouping of ceramic production did occur, as for example, we see at Barcino and Caldes de Montbui, is clear, but there does not seem to have been any grouping within the confines of the potteries themselves, with the kilns remaining separate in function and secondary rather than specialist.

The boundary, however, between what constitutes estate production for exchange and distribution, and industrial production is more complex and cannot be qualified in terms of scale alone. A fuller indication is provided by the relative

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<sup>261</sup> A fragment of Arretine Terra Sigillata has been found bearing the stamps C and XANTI, which appears to be associated with the more widely known, XANTIUS, cf Miró i Canals, J, Pallares i Comas, R and Garcia Alonso, F (1987) op. cit. n. 257 p 277-278.

<sup>262</sup> The stamp, TIBISI will be discussed in more detail shortly.

<sup>263</sup> cf Revilla Calvo, V (1993) op. cit. n. 76 p 109 n<sup>o</sup> 250.

<sup>264</sup> eg. L'Aumedina, Torre Llauder, Adarró, Can Feu.

dependency of the kilns and the primacy of ceramic production over other activities taking place on the site. Unfortunately the tendency of archaeology, as we described at the opening of the chapter, to concentrate on the amphora themselves and the kilns that produced them has meant that the structure of the associated economic unit has been ignored. We have already referred to Varro's advice to exploit all aspects of a villa's resources and numerous papyri refer to the leasing of property and the resources of the estate - we have already referred to one such lease of land in return for a share of the produce, and it seems that clay deposits were leased out in a similar fashion. A papyrus from Oxyrhynchus dated to the fifth of September, AD 243 records the leasing for two years of a pottery in the village of Senepta by Aurelius Paesis, a potter who makes wine vessels. In return for the pottery, Paesis undertakes to provide the estate owners with 15,000 4-choes jars, 150 double *ceramia* and 150 2-choes jars.<sup>265</sup> Some potters appear to have possessed kilns in a number of locations, such as the Claudianus who is recorded on two papyri from Oxyrhynchus dated to the 22nd September AD 260 and pre AD 269, as leasing potteries from the ex-gymnasiarch and councillor, Septimius Eudaemon and his sister Aurelia Apia; he is also probably the Claudianus attested in *P.Oxy.* 31. 2616 (post AD 244-249) as requesting 500 jars from a subordinate potter. Such an interdependence may explain the appearance of the same stamp at different potteries, such as the CLV attested at Torre Llauder and El Morrell, GALLIC at both Mas de Coll and Mas de l'Antoni Corts in Tarragona. However, with the state of the evidence as it is, it is impossible to state with assurance whether or not a kiln is directly operated by the estate owner as a subsidiary to the rest of the productive activity or whether they were leased out to a potter to operate as the primary function (ie. an industrial one) of a smaller economic unit.

Despite the problems attested above, it is possible to show the operation of industrial amphora production in the supply of the fish sauce industry in E. Tarraconensis. Although some ceramic production, such as that of Terra Sigillata Hispanica in the area of Tritium Magallum<sup>266</sup>, seems to have been primary, most amphora production seems to have taken place under the auspices of the wider

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<sup>265</sup> cf Cockle, H (1981) "Pottery manufacture in Roman Egypt: a new papyrus" in *JRS* 71 p 87-97.

<sup>266</sup> cf Solovera San Juan, M E (1987) op. cit. n. 175; on Terra Sigillata Hispanica generally, cf Mezquiriz de Catalan, M A (1961) *Terra Sigillata Hispanica* 2 vols (Valencia).

economic activities of the estate. However, in more developed regions of fish sauce production, such as the Bay of Cadiz we see a deliberate concentration upon the manufacture of Dr 7-11 by the kilns in the area<sup>267</sup> and it seems that a similar scale of industrial production existed to supply the fish salting industry based at Carthago Nova.

Although well attested in the literary sources as a centre of fish sauce production, archaeological evidence has only recently come to support this identification. Despite the exportation of these products being attested by the finds of amphorae: 50 % of the vessels found in the harbour at Carthago Nova were classified as Dr 7-11<sup>268</sup>, no kilns have yet been identified within the vicinity, although, a local origin is attested by the find of an amphora storehouse in the area of the ancient harbour<sup>269</sup>: in 1987 a large deposit of Dr 7-11 amphorae were excavated at the *Porteria de las Monjas/Condesa de Peralta* and seem to date to the later First Century AD (fig. 39.7-8). The amphorae were found without any sign of use and were found with a fine-walled vessel (Mayet XXIV) containing ochre - presumably for use in the inscription of *tituli picti*. It would appear, therefore, that the deposit represents a central repository for the storage and control of the exchange of amphorae, with the commodities being brought here from fisheries elsewhere in the hinterland, decanted into the amphorae which were then inscribed with *tituli picti* by customs officials and then exported across the Western Mediterranean. Although it is clear that some form of control existed, it is less clear how the amphorae reached this central point. A stamp was found with the vessels, but none of the extant finds bear any stamp and it is impossible to state whether the amphorae were brought from individual kilns or were produced en mass at a specific location and brought here, perhaps by a *negotiator*<sup>270</sup> who has undertaken to provide the vessels for the shipment of commodities purchased from production sites in the vicinity, although the latter hypothesis would appear to be

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<sup>267</sup> cf Peacock, D P S (1974) op. cit. n. 100; cf Campano Lorenzo, A (1994) op. cit. n. 100; Arteaga, O (1977) "Vorbericht über die Grabungskampagne 1976 auf dem Cerro del Mar" in *MM* 18 p 101-115; Arteaga, O (1985) op. cit. n. 205.

<sup>268</sup> cf Mas, J (1979) *El Puerto de Cartagena. Rasgos geográficos e históricos. Su tráfico marítimo en la Antigüedad* (Cartagena); cf Mas, J (1985) op. cit. n. 109.

<sup>269</sup> cf Martín Camino, M, Ángeles Pérez Bonet, Ma and Roldán Bernal, C (1991) op. cit. n. 80.

<sup>270</sup> cf Paterson, J (1982) op. cit. n. 19.

most likely considering the lack of a necessity to differentiate between amphorae.<sup>271</sup> A similar deposit of Dr 7-11 amphorae have been excavated at Cerro del Mar where a warehouse has been found dated to the First Century AD.<sup>272</sup> Large quantities of fish bones have been found and the site may have served as a central location for the bottling of fish sauces from processing sites in the vicinity prior to their shipment elsewhere. Unfortunately the state of the evidence as it is means that it is impossible to state whether or not these amphorae are the product of primary or secondary production.

As well as primary production to provide amphorae for the fish salting industry, it is also possible to see the operation of kilns as a secondary process to the manufacture of the fish sauce itself. In appearance these kilns will have been little different to those of estate production with the products of the kilns being limited in distribution and wideranging in type - being non-specialist and sporadic, to meet the immediate ceramic requirements of the factory as and when they might occur. One can reasonably envisage that ceramic vessels used purely in the manufacture of fish sauce, such as the strainers found within the fishery at Benalúa (**fig. 39.3**)<sup>273</sup> will have been produced within the immediate vicinity and it seems further reasonable that when such opportunities permitted<sup>274</sup>, other forms of pottery will have been produced as required. A small furnace has been found within the salting complex of Sanlúcar de Barrameda, which would have been used both to heat the fish sauces, thus hastening the preparation process<sup>275</sup>, but also to produce pottery as is attested by the finds of coarse ceramics, amphorae and Terra Sigillata.<sup>276</sup> The apparent specialisation of the kilns in the Bay of Cadiz which have afforded little or no evidence of ceramic production beyond the

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<sup>271</sup> Although a local origin is likely, the excavators noted that the fabric of the vessels paralleled that from Tivissa, cf Martín Camino, M, Ángeles Pérez Bonet, Ma and Roldán Bernal, C (1991) *op. cit.* n. 70 p 279, although lacking the iron oxide inclusions attested by Keay, S J and Jones, L (1982) *op. cit.* n. 79. It is also noted that the fabric composition differs from that of the kiln at Oliva, cf Enguix, R and Aranegui Gasco, A (1977) *op. cit.* n. 33.

<sup>272</sup> cf Arteaga, O (1977) *op. cit.* n. 267.

<sup>273</sup> cf Reynolds, P (1993) *op. cit.* n. 57 ware 11.9.8, p 143.

<sup>274</sup> ie the presence of a kiln, sufficient quantities of clay and expertise.

<sup>275</sup> cf Chapter 1.

<sup>276</sup> cf Esteve Guerrero, M (1952) "Sanlúcar de Barrameda (Cádiz): fabrica de salazón romana en La Algaida" in *NAH* 1-3 p 127.

amphorae associated with salt fish - principally Dr 7-11 and Dr 12 forms<sup>277</sup>, may suggest that these too, are part of the processing of salt fish, being either independent industrial processes supplying amphorae to the fisheries or being operated in conjunction with the fisheries in the possession of the same individuals. Unfortunately, without supporting epigraphic evidence it is impossible to ascribe the kilns of the region to either category of production. It does, however, seem probable with the correlation between fisheries and *villae* and the economic incorporation of the former into the latter as described earlier it must have been natural for the villa owner to apply the principle of self-sufficiency to his fish salting factory with the production of his own amphorae as well as the ceramic forms associated with the manufacture and exchange of salt-fish. Although no kiln has been identified, a number of malformed Dr 7 amphorae are preserved in the collection of Navarro Rubio as having come from Punta de l'Arenal (Javea).<sup>278</sup> Such vessels will have been deformed during firing and will have served no further purpose and been discarded as waste on the kiln site<sup>279</sup>, thus affording proof that the production of Dr 7 amphora was taking place either within the factory itself or in the immediate vicinity of the fish factory at Punta de l'Arenal.

We see, therefore, four methods of amphora production, either for the shipment of your own produce with the production of amphorae only occurring as a secondary activity to that found elsewhere on the site, whether it be a villa or a fish factory. The ceramic production will have been sporadic and unspecialised, merely being concerned with the provision of whatever items the site as a whole will need and whenever it is required. Despite the advice of the agricultural writers to achieve self-sufficiency, there will have been many who did not have either the money, the inclination or the resources to invest in ceramic manufacture and what appears to have been the norm was that a small number of sites produced pottery both for themselves and for sale to neighbouring sites. In view of the greater demand, production will have been less sporadic but equally unspecialised although the increased demand will have enabled the construction of more permanent kiln structures and the ceramics will have achieved a

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<sup>277</sup> cf Peacock, D P S (1974) op. cit. n. 100.

<sup>278</sup> cf Martin, G and Serres, Ma D (1970) op. cit. n. 57; cf also Aranegui Gasco, C (1981) op. cit. n. 33 p 533.

<sup>279</sup> Note the specification of perfect amphorae in lease agreements, cf Cockle, H (1981) op. cit. n. 265.

wider local distribution. The differentiation between such production and what is termed 'industrial' production is based not upon scale but on the primary economic activity of the potter - and thus his degree of independence from the wider villa economy. Unlike other forms of production, industrial ceramic production will have formed the primary economic activity of the site with a resulting specialisation and concentration upon the satisfaction of a specific demand. Unfortunately the definition of these categories is somewhat vague and can only be clarified by an understanding of the individuals concerned and it is to this question that we must now turn.

### 3. THE PRODUCERS AND MERCHANTS

Traditionally - as befitted the character of their commodities - producers and merchants of fish sauce were despised as a base section of society. Such an attitude extended to the wider appreciation of trade itself - its practitioners were not only considered somewhat morally reprehensible, but also to be drawn from the lowest echelons of society. Although the potential wealth gained from commercial activities was recognised, albeit with bad grace, by the Roman aristocracy, they resorted to landowning and money-lending as less sordid sources of revenue as opposed to an unseemly - and illegal in the case of Senators - involvement in trade.

Thus, as we have seen earlier, the accusation that someone was a salt fish dealer could be construed as a direct affront<sup>280</sup>, whilst Diogenes Laertius could describe the father of the Third Century BC philosopher, Bion, a salt-fish dealer, as an ex-slave who possessed no legal standing.<sup>281</sup> This criticism extended to trade as a whole with Aristotle advising that such should be avoided as being ignoble and inimical to virtue<sup>282</sup>, whilst Isocrates says that only the least affluent should involve themselves in farming or trade, and then only as an alternative to a life of crime.<sup>283</sup> This attitude is well attested

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<sup>280</sup> cf Macrobius *Saturnalia* 7.3.6, cf chapter 1.

<sup>281</sup> cf Diogenes Laertius 4.46, cf Curtis, R I (1991) op. cit. n. 5 p 153 n. 21.

<sup>282</sup> cf Aristotle *Politics* 7, 1328b-1329a: "It clearly follows that in the state which is best governed and possesses men who are just absolutely, and not merely relatively to the principle of the constitution, the citizens must not lead the life of mechanics or tradesmen, for such a life is ignoble and inimical to virtue. Neither must they be husbandmen, since leisure is necessary both for the development of virtue and the performance of political duties."

<sup>283</sup> cf Isocrates *Areopagiticus* 44-5: "It was not possible to direct everyone to the same work, because of the differences of circumstances. Our forebears therefore directed each individual to work appropriate to his means. They directed the less affluent to farming and trade in the knowledge that

in the Latin sources. Cicero states that commerce is not so discreditable when undertaken on a large scale<sup>284</sup> - a distinction that is similarly drawn by Tacitus in his description of C. Sempronius Gracchus who *per Africam ac Siciliam mutando sordidas meras sustentabatur*.<sup>285</sup> Philostratus, in differentiating between the merchantile activities of the sophist Proclus of Naucratis, states that evidently unlike more humble merchants, his subject was unmoved by a mean desire for profit.<sup>286</sup> In a society in which status was intrinsically linked with land, acquisition of wealth by other means was to verge on the morally reprehensible and to imply turbulence and threat to the accepted social order.<sup>287</sup> In a famous passage of his Second Verrine Oration Cicero categorises merchants as *homines tenues, obscuro loco nati*<sup>288</sup> - a view which seems to have been the norm in aristocratic circles. However, as we have seen above, if the activities were on a sufficient scale then even *mercatura* could become honourable. Whilst no wealthy investor would describe himself as a humble *mercator*, the more general *negotiator* (man of business) seems to have been acceptable.<sup>289</sup> It is in the wider range of interests exemplified by the *negotiator* that we find the resolution of the hostility of the aristocratic Romans towards commercial activity on the one hand and their apparent willingness to become involved - or at least, as we have seen, for the resources of their estates to be exploited in this fashion. Despite the moral strictures<sup>290</sup> and the statute of

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idleness leads to indigence and indigence to crime. They thought that to eliminate the source of evil was to eliminate the resulting crimes. Those who possessed private means were directed to riding, athletics, hunting and philosophy, in the observation that these activities keep people out of trouble where they do not foster excellence.”

<sup>284</sup> cf Cicero *De Officiis* 1.151.

<sup>285</sup> Tacitus *Annals* 4.13.2: “and later made a living by small trading in Africa and Sicily” (trans. Penguin ed.).

<sup>286</sup> Philostratus *Vita Soph.* 2.21: “On no occasion did he show himself avid of profits, mean-spirited or acquisitive.”

<sup>287</sup> Polybius *Histories* 6.56.1-3: “Again, the Roman laws and customs which concern money transactions are superior to those of Carthage. In the latter country no activity which results in a profit is seen as a cause for reproach, but to the Romans nothing is more disgraceful than to receive bribes or to seek gain by improper means. Just as they whole-heartedly approve the acquisition of money if the sources are forbidden.” (trans. Penguin ed.). The Elder Cato expressed the sentiment that the most admirable man was he who had doubled the size of his estate during his life, cf Plutarch *Cato Maior* 21.8: “That the man truly wonderful and godlike, and fit to be registered in the lists of glory, was he by whose accounts it should at last appear that he had more than doubled what he had received from his ancestors.” (trans. Langhorne ed.).

<sup>288</sup> Cicero *II Verr.* 5.167.

<sup>289</sup> cf D’Arms, JH (1981) op. cit. n. 17 p 24.

<sup>290</sup> cf Livy *History* 21.63.4: *Qaestus omnis patribus indecorus visus*. “Every form of profit seeking was thought unsuitable for senators.”

the Lex Claudia of 219-218 BC, according to which no Senator, or his son could own a ship of more than 300 jars capacity, it is clear that investment in commerce by the Roman aristocracy was commonplace.<sup>291</sup> In order to understand more fully the economic background to the commerce of the fish sauce, we must examine the individuals involved in this trade and to attempt to establish the veracity of the interpretation of the ancient literary sources that such commerce was, although profitable, confined to the lower strata of Roman society as an activity unsuitable for the well-to-do aristocrat.

The most frequent epigraphic evidence on amphorae are the stamps which appear on the spike, body or handles of the vessel; however, many are greatly abbreviated<sup>292</sup> and cannot be attributed to any particular individual. As a rule, however,

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<sup>291</sup> The Lex Claudia was restated by Caesar's Lex Julia de repetundis in 59 BC and was still in force 300 years later, cf Paul's Sententiae; Archi, G G et al. (1956) Pauli Sententiarum Fragmentum Leidense (Leiden), sent. 2 p 5: *Senatores parentesve eorum, in quorum potestate sunt, vectigalia publica conducere, navem in quaestum habere, equosve curules praebendos suscipere proibentur: idque factum repentudarum lege vindicatur.* What was perhaps the biggest deterrent was the risk involved in trade, cf Cato De Agri Cultura 1: *Est interdum praetare mercaturis rem quaerere, nisi tam periculosum sit, et item fenerari, si tam honestum sit.* "It is true that to obtain money by trade is sometimes more profitable, were it not so hazardous; and likewise money-lending, if it were as honourable." (trans. Loeb ed.). The risk inherent in ancient trade is perhaps best exemplified by the oft-quoted tale of Trimalchio who tells that he purchases five ships, loaded them with wine and despatched them to Rome. However, each ship was wrecked at a loss of 30 million HS and it was only by selling off his wife's jewellery that he was able to equip a further fleet which were able to bring in a profit of 10 million HS, cf Petronius Satyricon 76: "Well, as heaven will have it, I became boss in the house, and the old boy, you see, couldn't think of anything but me. That's about it - he made me co-heir with the Emperor and I got a senator's fortune. But nobody gets enough, never. I wanted to go into business. Not to make a long story of it, I built five ships, I loaded them with wine - it was absolute gold at the time - and I sent them to Rome. You'd have thought I ordered it - every single ship was wrecked. That's fact, not fable! In one single day Neptune swallowed up thirty million. Do you think I gave up? The loss honestly wasn't more than a flea-bite to me - it was as if nothing had happened. I built more boats, bigger and better and luckier, so nobody could say I wasn't a man of courage. You know, the greater the ship, the greater the confidence. I loaded them again - with wine, bacon, beans, perfumes and slaves. At this point Fortunata did the decent thing, because she sold off all her gold trinkets, all her clothes, and put ten thousand in gold pieces into my hand. This was the yeast my fortune needed to rise. What heaven wants, soon happens. In one voyage I carved out a round ten million. I immediately bought back all my old master's estates. I built a house, I invested in slaves, and I bought up the horse trade. Whatever I touched grew like a honeycomb. Once I had more than the whole country, then down tools! I retired from business and began advancing loans through freedmen." (trans. Penguin ed.). Perhaps the most significant aspect of Trimalchio's career is that once he had achieved such wealth he gave up his commercial activities in favour of investing in land and money-lending. On the relevance of Trimalchio to equestrian interests more widely, cf. cf D'Arms, J H (1981) *op. cit.* n. 17 chap. 5. It has been suggested that in fact, Habinnas is more representative of Equestrians generally than the exaggerated figure of Trimalchio. Certainly Trimalchio finds a ready parallel in the notoriously self-propagandist Pompeian merchant A. Umbricius Scaurus.

<sup>292</sup> This is not the place for a complete list of the most abbreviated amphora stamps - the reader is referred to Callender, M H (1965) *op. cit.* n. 83 for the fullest list of such. From Tarracensis, cf T

they are more substantial, but in many cases the subject is otherwise unknown and it cannot be divined whether they refer to the potter who produced the vessel, or to the estate owner or producer of the contents of the vessel.<sup>293</sup> Dressel believed that the names were those of the potters themselves, a view recently taken up by Paterson who suggests that the stamps represent the potters or the owners of the workshops (*figlinae*).<sup>294</sup> Such will perhaps have been slaves or freedmen and are evidenced by a number of stamps. A fragment of a Lamboglia 2 vessel from the Grau Vell de Sagunto bears a stamp on the shoulder of the vessel which reads EUTYCES F(icit). The form is generally dated to the First Century BC - First Century AD, although the vessel from Saguntum is unprovenanced, and generally they are associated either with the trade of olive oil from Calabria-Apulia or from Istria, although Aranegui notes that the piece does not appear to have originated from the former.<sup>295</sup> The appearance of single names, often of Greeks, can be taken as indicating a servile potter whilst the association of the stamp with the potter himself is best represented by the appearance of the abbreviation F following a name. The mark denotes the verb *facio*, to do and is translated as 'Eutyces made this'. The appearance of Greek names is relatively common with the stamp ZOT(ilius) on the base of a handle of a Dr 9 similis amphora from the Bas-de-Loyasse<sup>296</sup>; the amphora has a coarse, beige fabric with inclusions of quartz which

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attested from Turia - Callender 1687; S, H, L from Pascual 1 amphora in the Cap del Vol wreck - Foerster, F (1980) "A Roman Wreck off Cap del Vol, Gerona, Spain" in *IJNA* 9 p 244-253; V from Torre Llauder - Pascual Guash, R (1984) op. cit. n. 235 p 247; N, F from Saguntum - Aranegui Gasco, C (1981) op. cit. n. 33 p 3; F from Oliva; P from Daimus - Gisbert Santonja, J A (1987) op. cit. n. 33 p 107; A, B, M, O, P, R, S, T from Oliva - Enguix, R and Aranegui Gasco, A (1977) op. cit. n. 33 p 34; C from Can Venderell - Keay, S J and Jones, L (1982) op. cit. n. 79 p 60, Pascual Guash, R (1977) op. cit. n. 29 p 59-61; X from Empúries - Nolla i Brufau, J Ma (1974) op. cit. n. 59 p 148; R from Cap Bear III, Torre Llauder and Can Pedrerol de Baix - Colls, D (1986) "Les Amphores Leetanies de l'Epave Cap Bear III" in *REA* p 204, Pascual Guash, R (1977) op. cit. n. 29 p 52, 63.

<sup>293</sup> For a discussion of the identity of the names recorded on amphora stamps, cf Beltrán Lloris, M (1970) op. cit. n. 69 p 99-102; Peacock, D P S and Williams, D F (1986) op. cit. n. 2 p 9-11; cf Prevosti, M and Clariana, J F (1987) op. cit. n. 243 p 202-204; cf Remesal Rodríguez, J (1977) op. cit. n. 15.

<sup>294</sup> cf Paterson, J (1982) op. cit. n. 19 p 155.

<sup>295</sup> cf Aranegui Gasco, C (1981) op. cit. n. 33 p 95. The stamp is also attested from Rome, cf Callender, M H (1965) op. cit. n. 83 n. 601b. EUTYCH(es) also appears on a Baetican Dr 20 amphora from Monte Testaccio where it is dated to 223 AD. Also attested is a stamp reading EUTYCHIANI, cf Blázquez Martínez, J M, Remesal Rodríguez, J and Rodríguez Almeida, E (1994) op. cit. n. 209 n. 249 and 250.

<sup>296</sup> cf Dangreux, B and Desbat, A (1988) "Les Amphores du depotoir Flavien du Bas-de-Loyasse a Lyon" in *Gallia* 45 p 115-153.

recalls that of Tarraconensian amphora. The epithet F or *fecit* is well attested upon Spanish amphorae<sup>297</sup>, but is otherwise unknown in Tarraconensian contexts.

More readily attested are stamps alluding to a Greek servile involvement in the production of Tarraconensian pottery, amongst the most widely attested being the various stamps associated with the potter Philodamus. The potter seems to have operated from the villa at El Sot del Camp (Sant Vicenç de Montalt) appearing upon Oberaden 74 and Pascual 1 vessels from the site.<sup>298</sup> He seems to have operated in the late First Century BC-early First Century AD with stamps appearing in Augustan contexts at a number of sites along the Northern frontier, as for example, at Neuss.<sup>299</sup> Callender has posited a date prior to the mid First Century AD and has noted the presence of the stamp at London and Tarragona.<sup>300</sup> Similar stamps are attested on a number of sites within Tarraconensis and elsewhere; PHILE on a Pascual 1 amphora from Celsa, on a Dr 2 from Rome, PHILEM on a Dr 2 from Carthage and from Caesaraugusta, where it is associated with the stamp CELS/HELE.<sup>301</sup> The stamp is

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<sup>297</sup> cf [at]IMETUS FECIT, Antas - Callender, M H (1965) op. cit. n. 83 n° 146; CALLISTUS F(ecit), Corbridge, Rome, Trapani, Saalburg, Peña de la Sal - Callender, M H (1965) op. cit. n. 83 n° 233; HERMES F(ecit), Corbridge, Godmanchester, Richborough, Rome, Autun, Avenches, Ladenburg, Rouen, Juan Barba, Villar de Breves. On Dr 20 oil amphorae - Callender, M H (1965) op. cit. n. 83 n° 700; PATERNUS FE(cit) - this stamp is problematic as Paternus is also attested as the owner of a *figlina*, cf [ex] F(iglinis) PATERNI? - Colchester, Rome, Aretsburg, Wiesbaden, Worms, Poitiers, Clermont, Chassenard, Châtellais de Frémar, Forêt de Compiègne, Cologne - Callender, M H (1965) op. cit. n. 83 n° 1289 it is possible that the Figlina Paterniana had connections with the *societas* of the Iunii Melissi.

<sup>298</sup> cf Miró i Canals, J (1988) op. cit. n. 22 p 41-43; Pascual Guash, R (1977) op. cit. n. 29 p 64-66; Gorges, J G (1979) op. cit. n. 180 B-122; cf Miró i Canals, J (1981) op. cit. n. 39 p 337. The site seems to have principally produced Pascual 1 and Dr 2 4 amphora with a number of stamps attested including PHIL and PHILOD. A variety of fabrics were identified with a bright red colour although those of Philodamus are ocre.

<sup>299</sup> cf Chausa, A (1987) "Presencia de anforas vinarias en Vetera I y Neuss" in El Vi a l'Antiguitat: Economia, Produccio i Comerc al Mediterrani Occidental Actes I Colloqui d'Arqueologia Romana (Museo de Badalona) Mongrafies Badalonines n° 9 p 317.

<sup>300</sup> cf Callender, M H (1965) op. cit. n. 83 n° 1325 a and b.

<sup>301</sup> cf Beltrán Lloris, M (1987) op. cit. n. 35 p 57; the stamp CELS / CE / CELSI is attested upon Dr 2-4 amphorae from the kilns of Can Tintorer and Can Pedrerol de Baix where it is found in conjunction with HELE, cf Miró i Canals, J (1988) op. cit. n. 22 p 16-20; Pascual Guash, R (1977) op. cit. n. 29 p 51-54. The two stamps are found in association at La Chrétienne H with the latter also associated with that of APTI, cf Corsi-Sciallano, M and Liou, B (1985) op. cit. n. 91 p 78-94. CELSI appears at Sud-Lavezzi 3 with the stamp QVAD, cf Corsi-Sciallano, M and Liou, B (1985) op. cit. n. 91 p 130-144. The stamp PHILE is perhaps associated with that of C.PIRANUS / PHILOMUSUS. F(ecit) which appears on *dolia* from the wrecks of Diano Marina and Petit Congloué, and is related to that of C. PIRANUS / PRIMUS. FE(cit) which appears at both Diano Marina and Ile Rousse, cf Corsi-Sciallano, M and Liou, B (1985) op. cit. n. 91 p 106. They are probably associated with the PIRANI attested at Minturnes.

attested on a number of wrecksites, PH and PHIL on Dr 2-4 at Fourmigues; PHIL on Dr 2-4 amphora from La Chrétienne H where it is associated with AC and SC; the same combination of stamps appears at Sud-Lavezzi 3 - which supports at date for the stamp during the first quarter of the First Century AD.<sup>302</sup> The principal diffusion of the form appears, however, to have been to the North, being concentrated in Gallic sites and the bases of the Rhine, appearing at Ensérune, Beziers<sup>303</sup>, Tarragona, Cayla de Mailhac<sup>304</sup>, Ruscino, Laudun<sup>305</sup>, London, Wroxeter, Augst, Windisch, Hofheim, Fins d'Annecy, Geneva, Hoyos de San Sebastian, Trion, Autun, Vienne<sup>306</sup>, Ste Colombe, Nyon<sup>307</sup>, Neuss, Ventimiglia, Albenga, Oberaden, and also at Santa Pola.<sup>308</sup> The distribution of such vessels follows that of other early Tarraconensian wine amphorae. Particularly important is an example attested from Santa Pola on Oberaden 74 (Dr 28) amphorae, which reads: P(hilodamus). FIG(linae). H S (?).<sup>309</sup> The relationship of this stamp to others of Philodamus is unclear but may indicate the scale of Philodamus' production, perhaps representing his operation of a dependant workshop with the management of *figlinae* by freedmen being well known. Despite the widespread appearance of Philodamus on stamps we have no further evidence for the identity of the potter beyond a probable servile Greek origin. It may be related to the L. POMPEI(us) PHILO.... who appears on a *titulus pictus* from Windisch.<sup>310</sup>

<sup>302</sup> cf Corsi-Sciallano, M and Liou, B (1985) op. cit. n. 91 p 66-69; 78-94; 130-144.

<sup>303</sup> cf Tchernia, A (1971) op. cit. n. 24 p 64.

<sup>304</sup> P(?)HILC (or D).

<sup>305</sup> PHILODA... , cf Miró i Canals, J (1981) op. cit. n. 39 p 337.

<sup>306</sup> cf Callender, M H (1965) op. cit. n. 83 n° 1325.

<sup>307</sup> cf Pelichet, E (1946) "A propos des amphores romaines trouvées a Nyon" in Zeitschrift für Schweizerische Archäologie und Kunstgeschichte 8 n° 1048.

<sup>308</sup> cf Sanchez Fernandez, Ma J and Llobregad Collado, Ma T (1984) "Estudio preliminar sobre las anforas Romanas del Portus Illicitanus" in Lucentum 3 p 144. On the distribution of amphorae in Gaul during this period, cf Fitzpatrick, A (1985) op. cit. n. 23.

<sup>309</sup> cf Sanchez Fernandez, Ma J and Llobregad Collado, Ma T (1984) op. cit. n. 308 p 145.

<sup>310</sup> cf Bohn, O (1926) op. cit. n. 84 p 209 n° 16. That Philodamus was a figure of some importance may be supported by the identification of the *titulus* PHIL CLE VE on Dr 6 amphorae bearing the stamps T. H. B. (T. Helvius Basila) and BARBARI (P. Rubrius Barbarus). The daughter of P. Rubrius Barbarus, Quinta may have been the wife of L. Tarius Rufus, the suffect consul of 16 BC and Picentine landowner, cf Paterson, J (1982) op. cit. n. 19 p 153. Syme, R (1989) The Roman Aristocracy (Oxford) p 73, notes that no wife has been identified for Tarius Rufus. That he was involved in commercial activity, cf amphora stamps in his name at Este and Zagreb, cf Syme, R (1963) The Roman Revolution (Oxford) p 362 n. 2.

A further Greek slave is attested by the stamp HILARI on Dr 2-4 from the kiln of El Roser.<sup>311</sup> The stamp is attested at Strasbourg<sup>312</sup>; at La Chrétienne H the stamp HIL is associated with FRIV which is attested at Can Tintorer. A similar source can be envisaged for the stamp HILARI attested on Dr 2-4 amphorae at Diano Marina where it is associated with the stamp CALAM that is also present at Can Tintorer.<sup>313</sup> The abbreviated HIL is known from Perduto 1.<sup>314</sup> Nothing is known of the Greek Hilarus, although as with Philodamus it is possible that he engaged in the trading of amphorae on the basis of a *titulus* on a Beltr'n II b from Fos-sur-Mer, which reads HILA[...] and on the opposite shoulder there is a second cognomen - GERMA, whilst the handle is inscribed CXXXX.<sup>315</sup> Further Greek potters are attested in the region: ..ECHONI and ...OPOL / ..λVIR appear on Africana II vessels from Santa Pola<sup>316</sup>; that of SOSIBIA from Can Pedrerol de Baix is notable for recording a feminine name.<sup>317</sup> A Dr 2-4 wine amphora from Rome bearing a *titulus* recording its contents as Lauronensian wine bears the stamp PHAE.<sup>318</sup> Although the stamp is unattested within Tarraconensis, Tchernia has suggested that Lauro refers to modern Llerona del Valles (Caldas de Montbuy). Similarly Brindisian amphorae imported into the Ebro valley and the North-East (Fuentes de Ebro, Botorrita, Azaila, Empúries) bear the stamps of a number of Greek potters: Perdicas, Apolonus, Vehilus (and C. Vehilus), Abva-Iselus, Scopa and Protemus.<sup>319</sup> Amongst the Dr 20 oil amphorae at Portus Illicitanus is attested the name

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<sup>311</sup> cf Miró i Canals, J (1988) op. cit. n. 22 p 44-45; Pascual Guash, R (1977) op. cit. n. 29 p 67-68; Lopez Mullor, A (1985) "Excavaciones en la Villa Romana del Roser de Calella (El Maresme, Barcelona). Campanas de 1981 y 1982" in *Empúries* 47 p 179-185. A possible origin in N. Italy is suggested for the stamp on the basis of the finding at El Roser of the stamp ACASTI which originates in the Po valley, perhaps from Aco. If Lopez Mullor's hypothesis is correct then this would raise important questions as to the inter-provinciality of production, unfortunately evidence in support of this is lacking, although similar hypotheses will be discussed within the course of this chapter. The only forms attested at El Roser are Pascual 1, Laietana 1 and Dr 2-4 which would point to a local origin, as would its presence in the Diano Marino deposit.

<sup>312</sup> cf Lopez Mullor, A (1985) op. cit. n. 311 p 179.

<sup>313</sup> cf Corsi-Sciallano, M and Liou, B (1985) op. cit. n. 91 p 95-107.

<sup>314</sup> cf Corsi-Sciallano, M and Liou, B (1985) op. cit. n. 91 p 145-147.

<sup>315</sup> cf Liou, B and Marichal, R (1978) op. cit. n. 84 p 139 n° 31. One should also note the *titulus* on a Pelichet 47 vessel from the same site, which reads: VINV O[...] / HILARION[is? / ..]ERRI AB[...]

<sup>316</sup> cf Sanchez Fernandez, Ma J and Llobregad Collado, Ma T (1984) op. cit. n. 308 p 146.

<sup>317</sup> cf Miró i Canals, J (1988) op. cit. n. 22 p 16-18; Pascual Guash, R (1977) op. cit. n. 29 p 51-52 n. 13.

<sup>318</sup> cf Sealey, P R (1985) op. cit. n. 31 p 42; cf Tchernia, A (1971) op. cit. n. 24 p 73.

<sup>319</sup> cf Beltrán Lloris, M (1980) op. cit. n. 235 p 196.

PALISCAC that is otherwise unknown.<sup>320</sup> This use of Greek servile potters seems, therefore, to have been a relatively common occurrence and is well evidenced by amphora stamps. Such conform with the production patterns attested elsewhere on the Roman economy, as in the manufacture of Arretine ware where the use of skilled Greek slaves would appear to be the case on the basis of the frequency of such potters stamps.

Although thus far we have concentrated upon the employment of Greek slaves, it must be noted that not all potters were of servile status. We have already referred to the stamps of C. Piranus Philomusus and C. Piranus Primus which appear on *dolia* at Diano Marino, Petit Congloué and Ile Rousse. The Pirani seem to have formed an important *societas*, perhaps operating from Minturnae. A C. Piranus Felix is recorded as having made *dolia* at Petit Congloué and La Garoupe, where he is associated with C. Piranus / Sotericus. Also at La Garoupe is the stamp, C. PIRANUS / CERDO FEC(it).<sup>321</sup> The *dolia* from Ile Rousse and Diano Marina date the operation of the *societas* to the mid First Century AD with Cerdo, Felix, Sotericus, Primus and Philomusus being freedmen engaged in this commercial activity. The origin of the firm is, however, problematic - although conventionally associated with Minturnae, three of the four wrecks containing *dolia* of the Piranii bear cargoes of Tarraconensian Dr 2-4 amphorae.<sup>322</sup> Beyond the possibility that we discussed earlier of a link with the Tarraconensian stamp PHILE, no Pirani are attested within the region with which this thesis is concerned. The question of the origin of this concern must, therefore, remain unresolved.

The operation of freedmen potters is evidenced within Tarraconensis and would fit the scale of operation that appears to have been undertaken by Philodamus and Hilarus. A number of examples of the stamp of Iulius Theophilus have been found, which although it cannot be ascribed to a specific kiln appears to have originated in NE Tarraconensis. It appears along with M. PORC and QFS on Pascual 1 amphorae from the wreck of Cap del Vol (Gerona) which is dated to c20-15 BC.<sup>323</sup> Examples have

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<sup>320</sup> cf Sanchez Fernandez, Ma J and Llobregad Collado, Ma T (1984) op. cit. n. 308 p 142.

<sup>321</sup> cf Corsi-Sciallano, M and Liou, B (1985) op. cit. n. 91 p 43.

<sup>322</sup> The fourth contains Campanian Dr 2-4, cf Corsi-Sciallano, M and Liou, B (1985) op. cit. n. 91 p 118.

<sup>323</sup> cf Foerster, F (1980) op. cit. n. 292 p 245.

been found at Port-la-Nautique, Novaesium, Narbonne<sup>324</sup> and Vielle Toulouse where it post-dates 40 BC.<sup>325</sup> The stamp also appears on Dr 21-22 amphorae from Port-la-Nautique<sup>326</sup> and Zaragoza.<sup>327</sup> Nothing is known of Theophilus beyond the epigraphic evidence outlined, but he may be related to the Iulius Anicetus found on Pascual 1 amphorae from the villa and kiln at Sant Boi de Llobregat.<sup>328</sup> Examples of this stamp have been found from Vieille Toulouse and Enserune.<sup>329</sup> There is no indication of date beyond the presence of the stamp upon Pascual 1 amphorae. The *nomen* Iulius is extremely widespread thanks to the involvement of Iulius Caesar in the Peninsula, particularly through the recruitment of Spaniards<sup>330</sup>, some of whom appear to have become involved in commerce, such as the C. Iulius Reburus attested on an amphora from Weissenthurm.<sup>331</sup> Whether or not either Anicetus or Theophilus are to be associated with such patrons is unclear, but they are probably to be equated with Easterners of libertine status who engaged in the trading of wine during the Augustan period. Their economic independence may be indicated by the absence of any associated names or qualifying epithets.<sup>332</sup>

Amongst the most problematic of such Tarraconensian stamps is that of ANTH which appears on Dr 8/9 amphorae from a number of sites in North-Eastern

<sup>324</sup> cf Beltrán Lloris, M (1987) op. cit. n. 35 p 61.

<sup>325</sup> On Iulius Theophilus generally, cf Pascual Guash, R (1980) "Sobre algunas marcas anforciats Catalanas" in *RSL* 46, 1-3 p 261-279.

<sup>326</sup> cf Beltrán Lloris, M (1980) op. cit. n. 235 p 212.

<sup>327</sup> cf Pascual Guash, R (1980) op. cit. n. 325 p 275.

<sup>328</sup> cf Miró i Canals, J (1988) op. cit. n. 22 p 15-16; Pascual Guash, R (1977) op. cit. n. 329 p 50; Pascual Guash, R (1974) "Sobre un estampilla anforica de Empúries" in *Miscelanea Arqueologica* 2 p 140.

<sup>329</sup> cf Pascual Guash, R (1977) op. cit. n. 29 p 51; on Iulius Anicetus more generally, cf Pascual Guash, R (1980) op. cit. n. 325 p 264-266.

<sup>330</sup> cf Caesar *The Alexandrine War* 50: 'He [Cassius] enrolled a new legion, the Fifth, and this still further increased his unpopularity, both because of the levy itself and because of the extra expense. A force of 3,000 cavalry was made up and equipped at enormous expense. The province was given no respite.' (trans. Penguin ed.).

<sup>331</sup> cf Callender, M H (1965) op. cit. n. 83 n° 359 - C. IUL. REBURI. C. Iulius Reburus is attested as a veteran of Legio VII Gemina Felix in an inscription from Tarraco (*CIL* ii. 4157, Alföldy, G (1975) *Die Römischen Inschriften von Tarraco* (Berlin) n° 208: (C.) IULIO REBURRO / MIL(iti) LEG(ionis) VII G(eminae) F(elicis) / D(omo) SEGISAMA BRUSA- / CA, AN(norum) LII, A(erum) XXIII, ? LICINIUS RUFUS / MILES LEG(ionis) EIIUSDE[m] / [...]. Dated to the end of the First Century AD/beginning Second Century AD) and Callender has suggested that he entered business after his retirement from military service.

<sup>332</sup> An Anicetus appears amongst the slaves of C. Iulius Albinus who produced Dr 20 amphorae at Malpica during the period AD 120-170 (?), cf Callender, M H (1965) op. cit. n. 83 n° 333.

Tarraconensis, most notably at Empúries<sup>333</sup>, where the stamp is also attested upon a single example of Dr 2-4.<sup>334</sup> No kiln has been identified which can be associated with this production but the concentration of the stamp at Empúries would support a local origin.<sup>335</sup> Unfortunately little can be postulated further concerning the identity of ANTH. His appearance on Dr 8 and Dr 2-4 amphorae would support an origin in Gerona and he is included within the Greek potters attested within the region.<sup>336</sup> Recently, Iwona Modrzewska has suggested that ANTH is associated with the N. Italian stamps, ANTHI.FADI and T. ANTHI<sup>337</sup> which appear on Lamboglia 2/Dr 6A vessels from Venice. The form is generally accepted to have originated in Apulia in the Second Century BC and was being copied a century later in Northern Italy and the Adriatic where it was used for the transport of olive oil, wine and *garum*.<sup>338</sup> The local origin of the Ampuritanian Dr 8 amphorae must, however, tend against the connection with the Italian producer. Further to this is the relative incidence of the *nomen gentile* over the *cognomen* on amphora stamps. Although attested<sup>339</sup>, the use of the *nomen* is more usually qualified by association with the *praenomen*, as is the case of L. VOLTEIL and M. PORCI for example, or by the inclusion of the *cognomen*, such as IULI ANICETI, or an abbreviated form of such, like the AEL. ALB attested on a vessel from Rome.<sup>340</sup> Where a single name is used it appears to have been more common for the *cognomen* to have been cited. It would seem, therefore, on the basis of the above, that ANTH refers to the *cognomen* of a producer based near Empúries,

<sup>333</sup> cf Callender, M H (1965) op. cit. n. 83 n° 86 - Barcelona, Empúries; cf Nolla i Brufau, J Ma (1974) op. cit. n. 59 n° 11, 12, 23, 24, 28, 84, 87, 96, 98, 101; Almagro Basch, M (1952) Las Inscripciones Ampuritanas Griegas, Ibericas y Latinas (Barcelona) n° 222, 223; Tchernia, A (1971) op. cit. n. 24 p 65-69.

<sup>334</sup> cf Tchernia, A (1971) op. cit. n. 24 p 65; Pascual Guash, R (1984) op. cit. n. 235 p 139.

<sup>335</sup> The microscopic fabric analysis of the stamped Dr 8 amphorae proved unable to differentiate between either an origin in NE Tarraconensis or in Baetica, although the authors decided in favour of the former on the basis of archaeological evidence, cf Keay, S J and Jones, L (1982) op. cit. n. 79 p 55, sample n° 2.

<sup>336</sup> cf Pascual Guash, R (1980) op. cit. n. 325 p 275 - ANTH(eus), HILARI(us), PHAE(dimus), PHILOD(amus).

<sup>337</sup> cf Modrzewska, I (1993) "Alcuni Segni e Bolli di Anfori Scelte della laguna di Venezia" in BSAA 59 p 172-174.

<sup>338</sup> cf Peacock and Williams (1986) op. cit. n. 2 p 98-101.

<sup>339</sup> The most famous example being that of the Sestii, cf also MEVI at Baetulo, cf Comas i Sola, M (1985) op. cit. n. 81, [s]EMPR and LICIV[...] or LICIN at Cap Bear III, cf Colls, D (1986) op. cit. n. 292 p 204, and the CALPURNIO attested on Dr 20 amphorae, cf Callender, M H (1965) op. cit. n. 83 n° 234.

rather than the *nomen* of an Italian producer suggested by Modrzewska. A possible claimant for the producer ANTH is the L. Baebius Anthus attested on a Dr 8 amphora from Castro Pretorio.<sup>341</sup> The Baebii are a well attested Tarraconensian *gens* being particularly well evidenced in Valencia around Saguntum.<sup>342</sup> L. Baebius Anthus was involved in the trading of fish sauce from Spain during the First Century AD.<sup>343</sup> He seems to have operated between Empúries and Rome, being responsible for both the production of amphorae and their subsequent shipment - a situation that we have already postulated in the cases of Hilarus and Philodamus. It is impossible to ascertain whether or not Anthus is a member of the senatorial Baebii but it is more likely that, in view of the strictures against senatorial involvement in commerce he was a freedmen of the *gens*. They seem to have formed an important commercial *societas* with a number being attested on Dr 8 amphorae from Rome<sup>344</sup>, one of which is recorded as having contained LACCAT(um).<sup>345</sup> A M. Baebius Claricus is attested on a Dr 10 amphora from Castro Pretorio<sup>346</sup> whilst an involvement in the trading of wine might be evidenced by the appearance of an M. Baebius on a Dr 5 from the same location.<sup>347</sup> There are a number of attested examples of senators from Tarraconensis involving themselves in commerce and there are several important *societates* operating in the shipment of wine, olive oil and fish sauces from Baetica, such as the AA. Atinii and the QQ. Caecilii. It seems probable then that the Baebii represent a similar structure and investment in Tarraconensian produce, as is more readily evidenced to the south.

To conclude, therefore, it has been shown that both slaves and freedmen are recorded on amphora stamps as having been the potter responsible for the production of the vessel. It has also been shown that in a number of cases there was a unity of interest between the producers of the amphorae and the *negotiatores* responsible for the shipment of the vessels. Such freedmen, therefore, cannot have been the potters

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<sup>340</sup> cf Callender, M H (1965) op. cit. n. 83 n° 36.

<sup>341</sup> CIL xv.4704; cf Zevi, F (1966) op. cit. n. 17 p 235-236.

<sup>342</sup> On the Baebii, cf Alföldy, G (1977) Los Baebii de Saguntum TV del SIP 56 (Valencia).

<sup>343</sup> Two of his amphora bear the *tituli* in black on the neck of the vessel: G(ari) F(los), cf Beltrán Lloris, M (1970) op. cit. n. 69 p 226 n° 47.

<sup>344</sup> CIL xv.4735: M.Baebius N... .

<sup>345</sup> CIL xv.4734: M.Baebi.

<sup>346</sup> CIL xv.4750.

<sup>347</sup> cf Beltrán Lloris, M (1970) op. cit. n. 69 p 226 n° 46.

themselves, but must represent the owners of the workshops who will have produced amphorae for their own transit of produce brought in from elsewhere. Such patterns of production would, therefore, best represent the primary forms of ceramic manufacture that we have cited above as having been 'industrial'. As with the production of olive oil in the south of the Peninsula some such activities were affiliated with the concerns of commercial *societates* engaged in the shipment of a range of different products from the regions concerned. Operation through such *societates*, in the form of intermediate freedmen, enabled senatorial families such as the Baebii to circumvent the restrictions on their involvement in commerce<sup>348</sup> - that such an important commodity as fish sauce and salted fish products should be included in these enterprises is shown by the attestation of L. Baebius Anthus.

Philodamus is particularly significant in this regard as it would appear that not only did he produce his own amphorae<sup>349</sup>, but also engaged in the shipment of vessels on behalf of T. Helvius Basila and P. Rubrius Barbarus, who if the hypotheses of the status of Barbarus at least are correct, will have been landowners. Such men may well represent the localised estate production of amphorae, leaving the commerce of such to intermediate figures such as Philodamus. Not all landowners were able to supply their own vessels and a number of *figlinae* would appear to have produced amphorae for several different estates. Such may explain the appearance of stamps at a number of different kiln sites, for example, those of Sex. Domitius attested at both Tivissa and Sant Vinçent de Montalt, the Celsus stamps which appear at Can Tintorer and Can Pedrerol de Baix and which may have been related to the activities of Philodamus.<sup>350</sup>

As well as the diversification of the supply of amphorae we have also seen a lack of specialisation in the range of products exchanged. Commercial enterprises such as those of the Baebii seem to have operated as extensions of the Varronian villa economy. It is perhaps possible that the lack of specialisation and concern to supply all

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<sup>348</sup> Note that although the trading of commodities was frowned upon, the production of such was viewed merely as the achievement of the best possible self-sufficiency from your land and was thus socially acceptable.

<sup>349</sup> It is not clear whether or not he traded these vessels although there is no reason against this.

<sup>350</sup> Connections between these kilns seem particularly well evidenced with the coincidence of stamps between the two - AD, CELS, GRAE, HELE, cf Miró i Canals, J (1988) op. cit. n. 22 p 16-20; cf also Pascual Guash, R (1977) op. cit. n. 29 p 51-54.

aspects of estate production enabled such commercial enterprises to acquire a measure of respectability.<sup>351</sup> These activities enabled the practitioner to acquire the status accrued to a *negotiator* or man of business as opposed to a mere *mercator*.<sup>352</sup> This attention upon diversity is attested not only in larger scale operations, but also amongst other operators of *figlinae*. We have already referred to the practice of leasing out resources of estates and particularly those of potteries. Even when not leased the operation of kilns would, in all probability have been given over to a bailiff. Amongst the most widely distributed attestations to such, both geographically and typologically are those of Lucius Volteilius whose operation from El Sot del Camp is attested by the finding of thirty examples of the stamp from the site.<sup>353</sup> Pascual 1, Dr 2-4, Oberaden 74 and Tarraconense 1 amphorae are attested as having produced at the site with the stamp L. VOLTEIL(ius) being attested upon all forms produced there apart from the Oberaden 74 vessels. The stamps of PHIL, PHILOD and REO seem also to have had a local origin on the basis of the similarity of the vessels concerned with those of L. Volteilius.<sup>354</sup> The question must, therefore, be raised as to the relationship between the production of the vessels of Philodamus and L. Volteilius within the same *figlina*. As we have shown, Philodamus appears to have been operating on a scale larger than that of a mere potter and may well have been involved in the commercialisation of Tarraconensian produce. The relative frequency of his stamps would point to L. Volteilius as being the principal producer at El Sot del Camp, perhaps as the *vilicus* of the *figlina*. Nothing further is known of Volteilius and his *nomen* is otherwise unattested.<sup>355</sup> Within Tarraconensis, a (co)RNELIO VOLTE(iano) is attested at Empúries.<sup>356</sup> The stamp appears as part of the cargo of Tarraconense 1 amphorae at

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<sup>351</sup> cf Cicero *De Officiis* 1.151.

<sup>352</sup> One notes the relative frequency of the title *negotiator* over that of *mercator* in inscriptions - evidently the former possessed a higher measure of regard. It has to be wondered whether or not there was a degree of licence behind the proclamation of the likes of L. Priminus Ingenuus as a *Negotiator Vestiaris* at Xanten, cf Hassall, M W C (1978) op. cit. n. 176 p 43 n° 6; *CIL* xiii.8568.

<sup>353</sup> cf Pascual Guash, R (1977) op. cit. n. 29 p 64-66; Miró i Canals, J (1988) op. cit. n. 22 p 41-43.

<sup>354</sup> cf Pascual Guash, R (1977) op. cit. n. 29 p 66.

<sup>355</sup> Cicero refers to a Volteius in Sicily in 70 BC; a magistrate of the same name appears on coins of 88 BC, cf Babelon, E (1886) *Description historique et chronologique des monnaies de la République Romaine* vol 2 (Paris) p. 562.

<sup>356</sup> cf Almagro, M (1952) op. cit. n. 333 n° 12.

Palamos which is dated to the period 100-50 BC.<sup>357</sup> Further examples have been found at Mataro<sup>358</sup> and Empúries.<sup>359</sup> Beyond the Peninsula the distribution of the mark is concentrated within Western Narbonensis and Aquitania, having been found along the coast at Cap Bear, Port la Nautique and Fos-sur-Mer<sup>360</sup>, and within the interior at Narbonne, Enserune, Cayla de Mailhac, Auterive and Beziers.<sup>361</sup> The stamps have also been found at Mercadel, Mallorca.<sup>362</sup> Beyond the dating of the wreck of Palamos, we have little indication of the date of this stamp, although one in the First Century BC would be supported by its appearance at Enserune and Cayla de Mailhac which were abandoned during the Augustan period. The distribution of Volteilius' amphorae is typical of that of early Tarraconensian vessels being concentrated in the North Western provinces with produce reaching Britain and the Rhine frontier. As with later Tarraconensian commerce which appears to have become aligned towards the markets of the Mediterranean provinces and particularly Italy during the First Century AD, the market seems to have focused, particularly in the case of Pascual 1 amphorae along the Garonne river and thence along the Atlantic coast via Armorica to Southern Britain.<sup>363</sup> As we have seen, the Baebii seem to have traded specifically between the ports of Eastern Tarraconensis and Rome. That such men operated free from official control would seem to be evidenced by the lack of specialisation in the products that they traded, with the markets provided by the concentration of legions along the Rhine during the reign of Augustus being sufficient incentive for private commercial enterprise to develop in that direction. Similarly the opening up of Britain following the invasions of Caesar, particularly to the prestige economy, will have encouraged Tarraconensian producers such as L. Volteilius to develop their commercial activities accordingly.<sup>364</sup>

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<sup>357</sup> cf Foerster, F, Pascual Guash, R and Barberá, J (1987) op. cit. n. 63 p 83-89.

<sup>358</sup> cf Pascual Guash, R (1980) op. cit. n. 325 p 266.

<sup>359</sup> cf Almagro, M (1952) op. cit. n. 333 n° 207.

<sup>360</sup> cf Foerster, F, Pascual Guash, R and Barberá, J (1987) op. cit. n. 63 p 87.

<sup>361</sup> cf Taffanel, O and E (1947) "Marques d'amphores trouvées au Cayla de Mailhac" in *Gallia* 5 p 143; cf also Foerster, F, Pascual Guash, R and Barberá, J (1987) op. cit. n. 63 p 87-88; Pascual Guash, R (1980) op. cit. n. 325 p 277-278; Tchernia, A (1971) op. cit. n. 24 p 74.

<sup>362</sup> cf Pascual Guash, R (1980) op. cit. n. 325 p 277.

<sup>363</sup> cf Fitzpatrick, A (1985) op. cit. n. 23.

<sup>364</sup> The marketing of Tarraconensian produce and the distribution of amphorae will be discussed in more detail later in this chapter.

An early date is also possible for the stamps of L. VENULEI. Although no kiln is identifiable, the frequency of its incidence at Empúries would suggest an origin in the region, although fabric analysis has proved inconclusive.<sup>365</sup> It is attested at Agen<sup>366</sup>, Cap de Creus<sup>367</sup> and Empúries<sup>368</sup> on Tarraconense 1 amphorae and an example has been found on a Dr 24-25 vessel from the latter site.<sup>369</sup>

Also perhaps worth noting in this regard are the stamps of Sextus Domitius from the kiln of L'Aumedina, Tivissa. They appear only on Oberaden 74 amphorae from the site and are found at a number of sites in the interior of Gaul, particularly in relation to the principal rivers - the Garonne and Rhône-Saone, from which they reached the Rhine frontier, although they do not appear to have been traded as far as Britain. Examples of the stamp are attested at Cébezan, Vivios, Ensérune, Vaison, Carpentras, Saint-Pauliuen, Le Puy M., Rodez, Hery, Lyon, Limoges and Périgueux in Gaul, and along the Rhine at Basilea, Nyon, Lugano, Dangstatten, Neuss and Oberaden.<sup>370</sup> Few stamps have been found from the region which contain more than a single name, however, an example from Limoges, dated to the Augustan period reads: SEX. DOMITI / SATURIO.<sup>371</sup> The second name is otherwise unknown, however, it will perhaps be reasonable to suggest that Saturio is the slave responsible for making the amphora - although it should be noted that Sextus Domitius is nowhere associated with another name. There is little further evidence for the identity of the individual concerned. Pascual<sup>372</sup> has noted the presence of the proconsul, C. Domitius Calvinus in the region between 39-37 BC whilst campaigning against the Ceretani<sup>373</sup>, and has suggested that Sextus Domitius would owe his citizenship to Calvinus. A link with the Porcii has also been postulated on the basis of an inscription set up at Barcelona by

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<sup>365</sup> cf Keay, S J and Jones, L (1982) op. cit. n. 79 sample n° 11 p 55.

<sup>366</sup> cf Callender, M H (1965) op. cit. n. 83 n° 977.

<sup>367</sup> cf Nolla i Brufau, J Ma (1987) op. cit. n. 61 p 222.

<sup>368</sup> cf Almagro, M (1952) op. cit. n. 333 n° 215, 216, 247.

<sup>369</sup> cf Keay, S J and Jones, L (1982) op. cit. n. 79 p 55.

<sup>370</sup> cf Revilla Calvo, V (1993) op. cit. n. 76 p 80-82; Pascual Guash, R (1980) op. cit. n. 325 p 266-267; Tchernia, A (1971) op. cit. n. 24 p 64-65; Tchernia, A (1976) op. cit. n. 190 p 974-976; Callender, M H (1965) op. cit. n. 83 n° 1602 - although he does not consider it to have been of a Tarraconensian origin.

<sup>371</sup> cf Revilla Calvo, V (1993) op. cit. n. 76 p 81.

<sup>372</sup> cf Pascual Guash, R (1980) op. cit. n. 325 p 267.

<sup>373</sup> Dio Cassius 48.42.1-6.

Domitia Lucila in honour of her son L. Porcius Celer<sup>374</sup>, although I have been unable to find any further evidence which would support a link between the two *gentes*. A Cn. Domitius Felicio is attested in *tituli picti* on Dr 5 and Dr 7-8 vessels from Castro Pretorio where the contents are recorded on the neck of the vessel as having been MURIA EXCE(lens) FLOS<sup>375</sup>, although it is uncertain whether this can be related to the production of amphorae from Tivissa. The Domitii do, however, appear to have been an important family in the region with a C. Domitius Maternus serving as a member of the *ordo* of Barcelona.<sup>376</sup> It is possible, therefore, that Sextus Domitius owned estates in the vicinity of Tivissa, but his relationship to the stamp TIBISI cannot be ascertained and without further evidence it is impossible to surmise the status of Sex. Domitius, although to judge by the predominance of his stamps at the kiln and the relative frequency of their incidence in Gaul, a higher status may be preferred.

We have already briefly referred to a second class of stamps, namely that which refers to the name of the *figlina* or workshop. These are derived either from the name of the owner of the property or the geographical location. The most well attested examples of these are found in the Guadalquivir valley where large numbers of *figlinae* can be securely identified thanks to the frequency of their stamps within the context of the kiln sites of the region. The frequency of these *figlinae* may imply a predominance of industrial production of amphorae with estate owners leasing their kilns and/or clay deposits to independent potters. Most frequently we see the use of the name of the individual prefixed by the the abbreviation F(iglina), as for example, in the case of the stamps of F. SCIM/NIANO and variants that originated near Astigi in and around 161 AD.<sup>377</sup> The stamp FIG. GEM/ELLIANI<sup>378</sup> may be related to that of GEM attested at

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<sup>374</sup> cf Mariner Bigorra, S (1973) *Inscripciones romanas de Barcelona* (Barcelona) n° 64.

<sup>375</sup> cf Beltrán Lloris, M (1970) op. cit. n. 69 p 234 n° 95. An unknown vessel type from Bonn is attested by Beltrán as having borne the name in conjunction with the *titulus*: MUR(iae) AR(gutae) EXCEL(lentis) F(los).

<sup>376</sup> cf Mariner Bigorra, S (1973) op. cit. n. 374 n° 53.

<sup>377</sup> Numerous variants of this stamps are found, for a summary cf Beltrán Lloris, M (1970) op. cit. n. 69 n° 438. Examples have been found on Beltr'n V vessels from Corbridge, Niederbieder and Denia. The stamp may be associated with the Scimnius Crescens who appears on a Dr 20 amphora from Bolards. cf also Callender, M H (1965) op. cit. n. 83 n° 248 - FCARES, from Rome and York, n° 1289 - F PATERNI; Mariner Bigorra, S (1954) "Notas de Epigrafía Valenciana" in *APL* 5 p 226 the stamp F. SCIM/NIANI appears on a Dr 20 amphora found between Denia and Ibiza, cf also p 227, the stamp originates from Las Delicias.

<sup>378</sup> Callender, M H (1965) op. cit. n. 83 n° 249.

Saguntum. The latter seems to have been a local *negotiator* operating in the First Century or early Second Century AD, with the stamp appearing on a locally produced Dr 2-4 amphora as well as in an inscription: C. GEM, which is present on a lead anchor weight. Evidently, therefore, *navicularii* or shipowners could engage in the production, and also ship their own amphorae. Whether this involvement extended as far as the manufacture of the contents themselves is less clear, although it may well be borne out by the evidence of the activities of such *societates* as the Baebii, a family with whom the *gens Gemina* appears to have been related.<sup>379</sup> Some of these *figlinae* would appear to have been operated by wealthy figures, or at least for the designating epithet to refer to the estate owner himself. Paterson<sup>380</sup> has suggested that the BARBARI stamps which appear on Dr 6 amphorae transporting wine from Northern Italy, refer to P. Rubrius Barbarus, the father-in-law of the Consul of 16 BC, L. Tarius Rufus whom we discussed earlier. It is also possible that the stamp refers to the Fourth Century AD Consul and City Prefect, Barbarus Probianus who appears in *tituli* on Dr 33 vessels containing *liquamen*<sup>381</sup>, although the discrepancy between the dating of the two would exclude any connection. The relationship between the stamp BARBARI and that of F. BARBA<sup>382</sup> is problematic and the *figlina* may have in fact derived its name from a geographical location.<sup>383</sup>

Also attested within Tarraconensis, although they do not appear to have been of a local origin are stamps referring to *Officina* and *Fundi*. The stamp OFIC BILIC is attested at both Tarragona and Windisch where it is dated to the second half of the First Century AD<sup>384</sup>, whilst NOFIC. OLA... NOSAC. OC is attested from Cartagena.<sup>385</sup> Even so the appearance of stamps pertaining to *figlinae*, whether or not they are derived from the owner's name or a geographical location, are rare, as are those which

<sup>379</sup> Perhaps related to these stamps is an example from Beth-Shean which appears upon an unspecified form and reads: GEMO/NNEA, cf Last, R and Porath, P (1993) "A Roman stamped amphora rim from Beth-Shean" in *ZPE* 95 p 52.

<sup>380</sup> cf Paterson, J (1982) op. cit. n. 19 p 153.

<sup>381</sup> cf Zevi, F (1966) op. cit. n. 17 p 226-7: LIQUAMEN BARBARUS PROBIANUS C(larissimus) V(ir).

<sup>382</sup> Callender, M H (1965) op. cit. n. 83 n° 179.

<sup>383</sup> Callender, M H (1965) op. cit. n. 83 n° 160a: II AUR HERACAE // PAT(er) FIL(ius) [ex] F(iglinis) BAR(bensis).

<sup>384</sup> cf Beltrán Lloris, M (1970) op. cit. n. 69 p 51.

<sup>385</sup> *CIL* ii.6254.29; cf Beltrán Lloris, M (1970) op. cit. n. 69 p 169 n° 333.

refer to a geographical location alone and when they are attested within Tarraconensis seem, on the whole, to be found on imported vessels with such epigraphic nomenclature appearing to have been a Baetican innovation. Two, however, can be ascribed to an origin in Tarraconensis and merit some discussion here.

The first consists of the name of the producer or potter as well as that of the location of the kiln. Two variants of this stamp are known and presumably point to the work of separate servile potters. One found at El Puig reads BC MERITIS-SACYNTO<sup>386</sup>, whilst a further example from Rome reads B.C. MATERNI-SACYNTO.<sup>387</sup> Although no examples of the stamp have been found from the excavations at Saguntum, their provenance is assured both by the epigraphic evidence as well as by their appearance upon Dr 2-4 produced in the vicinity of the town. They may also be related to the stamp BC which appears on Saguntine Dr 2-4 vessels from Grau Vell.<sup>388</sup> Possibly related to this is a stamp from Vilaseca which reads ...)BC(...<sup>389</sup> and Mont Beuvray.<sup>390</sup> As to the chronology of these finds, the principal deposit of amphora at Grau Vell lies in the period 40 BC-150 AD (level iii).<sup>391</sup> As yet no kilns have been found which pertain to this production, however, finds of ceramic wasters as well as quantities of stamps of M.P.M and .RINI and other residue point to the existence of kilns in the area of Els Arcs and Las Jovades, where a number of *villae* have already been located.<sup>392</sup> Saguntum seems to have possessed a flourishing ceramic industry in the First Century AD, seemingly in the hands of a small number of producers several of whom seem to have operated as *societates* such as those of [ ]GEM[ ] and BC[ ]. Evidently the production and commerce operating from the city was sufficiently lucrative to attract investment from Senatorial circles (the Baebii).

The mark TIBISI is securely ascribed to the kiln site of L'Aumedina where it is found on Pascual 1, Dr 2-4 and Dr 7-11 amphorae produced on the site.<sup>393</sup> The stamp

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<sup>386</sup> cf Beltrán Lloris, M (1970) op. cit. n. 69 p 123 n° 48; Callender, M H (1965) op. cit. n. 83 n° 184a.

<sup>387</sup> Callender, M H (1965) op. cit. n. 83 n° 184b; cf Mantilla Collantes, A (1987) op. cit. n. 44 p 411.

<sup>388</sup> cf Mantilla Collantes, A (1987) op. cit. n. 44 p 409; Aranegui Gasco, C (1978) "Anotaciones sobre las anforas del nivel de relleno del Grau Vell (Sagunto, Valencia)" in *Saguntum* 13 p 310.

<sup>389</sup> cf Beltrán Lloris, M (1970) op. cit. n. 69 p 123 n° 49.

<sup>390</sup> cf Aranegui Gasco, C and Mantilla Collantes, A (1987) op. cit. n. 33 p 101.

<sup>391</sup> cf Aranegui Gasco, C (1982) *Excavaciones en el Grau Vell (Sagunto, Valencia)* TV del SIP 72 (Valencia).

<sup>392</sup> cf Mantilla Collantes, A (1987) op. cit. n. 44 p 413.

<sup>393</sup> cf Revilla Calvo, V (1993) op. cit. n. 76 p 79-80.

is found at a number of sites along the coast of S. France extending from Cataluña via the Gulf of Lyon to Naples.<sup>394</sup> Despite its incidence little can be said of the relationship of the stamp to others produced on the site, particularly that of SEX.DOMITI or even the identity of the stamp itself. Apart from the linguistic parallels between TIBISI and Tivissa, a link with the island of Ebusus has also been suggested, perhaps recording the Catalan name for the island, Eivissa.<sup>395</sup> Equally, although a geographical toponym is accepted as the most probable definition, the possibility that it refers to the name of an individual has also been raised.<sup>396</sup> It seems most likely, therefore, that the name refers to that of the *figlina* or estate upon which the kilns were located. Unlike the stamps from Saguntum it cannot be reliably linked with a particular *societas* and its exact status remains somewhat unclear.

Thus we appear to have three categories of citation within amphora stamps: firstly, the potters themselves, often of an Eastern servile origin; secondly, and often related to the above, were the *negotiatores* engaged in the trading of their own products - some were merely the freedmen owners of *figlinae* whilst we also see the involvement of members of Senatorial families and other figures of wealth. With the traditional strictures against the involvement of such in commerce, we see the use of freedmen and the employment of *societates*, as are attested on a number of stamps from Tarraconensis. As well as those stamps designating the individuals involved in this production there are those which refer to geographical locations - principally of *figlinae*. The most commonplace form appears to have been those designating the names of the estate owners themselves. As we have seen, senatorial families such as the Baebii were involved in the commerce of goods from the region. With the autarchic preoccupations of the villa economy it is no surprise to see the involvement of such wealthy landowners in the production of amphorae.

The participation of the wealthy is particularly well attested in the Baetican oil industry with a senatorial *gens* such as the Fabii Cilones directly engaging in the production of amphorae to trade the produce from their estates in the Guadalquivir

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<sup>394</sup> Empúries - cf Almagro, M (1952) op. cit. n. 333 n° 206, Nolla i Brufau, J Ma (1974) op. cit. n° 64 p 169; Port-la-Nautique, Fos, Marseilles, Saint-Cyr-sur-Mer, Pompeii.

<sup>395</sup> cf Tchernia, A (1971) op. cit. n. 24 p 69.

<sup>396</sup> cf Tchernia, A (1971) op. cit. n. 24 p 69 n° 80: Ti. Bisi, Tib. Isi(ci) or Tib. I(uli) Si(...).

valley. The production of oil was not the only industry to attract wealthy investment and a number of similar stamps appear in Tarraconensis. The possession of extensive estates will have provided sufficient resources to enable the manufacture of amphorae: larger scale amphora production which will have required an increased investment of time and specialised resources, and a tendency therefore, to acquire a degree of economic independence and thus to come under the operation of freedmen potters. Where landowners are attested the production is more limited coming under the wider sphere of the villa's activities. Their presence need not be limited to merely the production of amphorae for the produce of their own estates and it is evident that large numbers relied on purchasing their amphorae from neighbouring potters and sometimes it would appear, from more than one.

The distinction, epigraphically at least, is difficult to discern between the *tria nomina* of potters and the owners of *figlina* on the one hand, and of the landowners themselves on the other. However, on a number of occasions within Tarraconensis, we find stamps recording the names of individuals of too high a status to have been directly involved in ceramic production and they must, therefore, represent the landowners themselves. Such are the uncertainties of these identifications, however, that there shall be a degree of overlap with what has been said earlier.

Amongst the most often cited in this regard are the stamps of CN. LENTUL / ...RIS which are attested on Pascual 1 amphorae from Empúries<sup>397</sup>, Port-la-Nautique and Auterive.<sup>398</sup> The cognomen Lentulus is most readily associated with the *gens* Cornelia and recently Piero Gianfrotta<sup>399</sup> has shown that the stamps refer to the senator Cn. Cornelius Cn. F. Lentulus Augur, the consul of 14 BC and Proconsul of Asia in 2-1 BC.<sup>400</sup> Although there is no evidence directly linking Lentulus Augur to the possession of estates in the region, nor have the amphorae referred to above been associated with a particular kiln, however, their attestation upon Pascual 1 would point to the ownership of estates in Cataluña, or perhaps Southern France. Links between the region and the

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<sup>397</sup> cf Beltrán Lloris, M (1970) op. cit. n. 69 p 135 n° 107; Almagro, M (1952) op. cit. n. 333 n° 217.

<sup>398</sup> cf Pascual Guash, R (1980) op. cit. n. 325 p 271; Miró i Canals, J (1988) op. cit. n. 22 p 218; Gianfrotta, P A (1982) op. cit. n. 17 p 476 - Auterive: [Cn(aei) Lentul(i)] / AUGURI[s].

<sup>399</sup> cf Gianfrotta, P A (1982) op. cit. n. 17.

<sup>400</sup> The fullest discussion of Lentulus Augur occurs in Syme, R (1989) op. cit. n. 310 p 284-299.

upper echelons of the Roman aristocracy seem to have been close with such notables as Licinius Sura being attested at Tarraco.<sup>401</sup> It seems not unreasonable, therefore, that Lentulus would have possessed estates in the vicinity. Seneca describes him as *divitiarum maximum exemplum* - the most conspicuous example of wealth who owed everything to Augustus<sup>402</sup>, and it seems that he acquired the estates perhaps through marriage, inheritance or through gifts.<sup>403</sup> The appearance of his stamps on Pascual 1 amphorae is dated to the Augustan period, certainly prior to the death of Lentulus in AD 25 at which point Suetonius tells us that his possessions were siezed by Tiberius.<sup>404</sup> Although there is no direct evidence for an Imperial siezure of estates at this point, Gianfrotta cites the existence of a stamp from Port-la-Nautique bearing the letters IMP(eratoris)<sup>405</sup> and suggests that Iulius Anicetus and Iulius Theophilus are Imperial freedmen - an hypothesis for which I have been unable to find any support.

Lentulus Augur is not, however, exceptional and a number of Senatorial names are attested on amphorae. Amongst those produced at the kiln site of L'Almadrava (Setla, Mirarosa, Miraflor) is the stamp C.C.V.LM.F.S which is found on four Dr 30

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<sup>401</sup> cf Fabre, G, Mayer, M and Roda, I (1984) *Inscriptions Romaines de Catalogne I. Barcelone* p 168 n° 125. Fron Sant Andreu de Llavaneres: L(ucio) LICINIO / SECUNDO / ACCENSO / PATRONO SUO / L(ucio) LICIN(io) SURAE / PRIMO SECUND(o) / TERTIO CONSUL(atu) / EIUS IIIII VIR(o) AUG(ustali) / COL(oniae) I(uliae) U(rbis) T(riumphalis) TARRAC(onis) / COL(oniae) F(aventiae) I(uliae) A(ugustae) P(aternae) BARCIN(onis) / C(aius) TROCINA / ONESIMUS / AMICO.

<sup>402</sup> Seneca *De Beneficiis* 11.27: *Cn. Lentulus augur, divitiarum maximum exemplum, antequam illum libertini pauperem facerent, hic, qui quater milies sestertium suum vidit (proprie dixi; nihil enim amplius quam vidit), ingenii fuit sterilis, tam pusilli quam animi. Cum esset avarissimus, nummos citius emittebat quam verba: tanta illi inopia erat sermonis. Hic cum omnia incrementa sua divo Augusto deberet, ad quem attulerat paupertatem sub onere nobilitatis laborantem, princeps iam civitatis et pecunia et gratia subinde de Augusto solebat queri dicens a studiis se abductum; nihil tantum in se congestum esse, quantum perdidisset relicta eloquentia.* "Gnaeus Lentulus, the augur, who, before his freedmen reduced him to poverty, was the most conspicuous example of wealth - this man, who saw his four hundred millions (I have spoken with strict accuracy, for he did no more than 'see' them!), was destitute of intelligence, as contemptible in intellect as he was in heart. Though he was the greatest miser, it was easier for him to disgorge coins than words - so great was his poverty when it came to talking. Though he owed all his advancement to the deified Augustus, to whom he had come with nothing but the poverty that struggling under the burden of a noble name, yet, when had now become chief citizen of the state, both in wealth and influence, he used to make constant complaint, saying that Augustus had enticed him away from his studies; that he had not heaped upon him nearly so much as he had lost by surrendering the practice of eloquence." (trans. Loeb ed.).

<sup>403</sup> He is attested as patron of the *publicani* in Asia and Bithynia, cf Syme, R (1989) op. cit. n. 310 p 295 n° 102; *Inscr. Eph.* iii.658.

<sup>404</sup> Suetonius *Tiberius* 49.1: *metu et angore ad fastidium vitae ab eo actum.*

<sup>405</sup> cf Gianfrotta, P A (1982) op. cit. n. 17 p 478; Bouscaras, A (1974) "Marques sur amphores de Port-la-Nautique" in *Cahiers d'Archeologie Subaquatique* 3 p 109.

vessels from the site.<sup>406</sup> Recently it has been suggested that this stamp refers to a figure of senatorial status - the C.V. of the stamp referring to *clarissimus vir*.<sup>407</sup> The stamp of a C. Antestius is found on Pascual 1 amphora from Baetulo.<sup>408</sup> The same stamp is attested within Augustan levels at Vic-Fesenzac (Gers) whilst C ANT appears at Luni where it is dated to 40-50 AD.<sup>409</sup> The Antestii or Antistii are a well attested Italian *gens* being chiefly found in Central Italy. The most important member of the family was the suffect consul of 30 BC, C. Antistius Vetus, who governed Hispania Citerior in 25 BC. As such it is likely that Antistius was able to acquire property in the region, perhaps in the area of the *mansio Antistiana*.<sup>410</sup> Without the survival of the cognomen on the amphora stamps it is impossible to discern whether or not it refers to the consul himself or to a freedman of the same.<sup>411</sup>

Attested on a Tarraconense 1 amphora from Baetulo is the name C. Muci(us)<sup>412</sup> which predates 30 BC. This *nomen* is most usually associated with the *gens* of the Mucii Scaevolae, a plebian family which achieved *nobilitas* in the Second Century BC thanks to its skill at jurisprudence. A P. Mucius Scaevola is attested at Tarraco<sup>413</sup> and may have served as patron of the town<sup>414</sup> - a function which would presuppose his possession of estates in the vicinity.

Not all landowners were senators, however, or for that matter not all stamps can be associated with an individual of whatever status. Several names which appear on amphorae do seem to refer to the landowners who are otherwise unknown and it seems possible that some at least, of them were men of sufficient substance to serve as *decuriones* in the neighbouring *coloniae* and even on occasion, to have been friends with the Senatorial aristocrats referred to above.

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<sup>406</sup> cf Gisbert Santonja, J A (1987) op. cit. n. 33 p 110.

<sup>407</sup> cf Aranegui Gasco, C and Gisbert Santonja, J A (1992) op. cit. n. 43 p 105.

<sup>408</sup> cf Comas i Sola, M (1985) op. cit. n. 81 p 129.

<sup>409</sup> cf Miró i Canals, J (1988) op. cit. n. 22 p 214-5.

<sup>410</sup> cf Miró i Canals, J (1988) op. cit. n. 22 p 215; cf also Palli, F (1985) *La Vía Augusta en Catalunya* (Bellaterra) p 155-6 - I regret that I have been unable to consult this source directly.

<sup>411</sup> A L. Antistius is also attested at Tarraco, cf Alföldy, G (1975) op. cit. n. 331 n° 507.

<sup>412</sup> cf Comas i Sola, M (1985) op. cit. n. 81 fig. 57.

<sup>413</sup> cf Alföldy, G (1975) op. cit. n. 331 n° 2: P(ublio) MUCIO [.f(ilio)] / SCAEVOL[ae]; Vives, J (1971) n° 1291.

<sup>414</sup> cf Miró i Canals, J (1988) op. cit. n. 22 p 212.

One such figure is L. Herennius Optatus, whose name appears on Pascual 1 and Dr 2-4 amphorae and *tegulae* from the villa and kiln at Torre Llauder.<sup>415</sup> The name is particularly well attested on *tegulae* being found on a number of sites in Valencia: Elche, Valencia, Alicante, Tossal de Manises and Saguntum; within Cataluña at Tarragona, Barcelona and Empúries; and within the Maresme itself, at San Ginés de Vilassar, Can Torradeta, Can Rafart, Pollentia and Torre Llauder itself.<sup>416</sup> It is also found outside the Peninsula at Ventimiglia, Frejus and Rome.<sup>417</sup> The stamps are morphologically similar to those of CASTORIS and MARI which are also attested at Torre Llauder and are dated to the Flavian period, although the appearance of the stamp on Pascual 1 amphorae would support an earlier date and one in the Second-Third Centuries AD has also found favour.<sup>418</sup> Little can be said as to the status of Herennius Optatus, although his ownership of the villa of Torre Llauder might be suggested by the *tegulae* found there.<sup>419</sup> Possibly to be related to these stamps are the OPTAT(i) which appears on Dr 2-4 amphorae from Cavallo 1 and the OPT attested at La Chrétienne H.<sup>420</sup>

As well as L. Herennius Optatus, a number of other Herennii are attested. A T. Heren(nius) appears on Pascual 1 amphorae from Empúries<sup>421</sup>, whilst *tegulae* bearing stamps of L. HERENN and L. HERENNI / HERENNI are found at Baetulo<sup>422</sup>, Tarragona, L'Alcudia de Elche<sup>423</sup>, Bocairent, Frejus and Ventimiglia.<sup>424</sup> The relationship of these to L. Herennius Optatus is, however, unclear. As to the identity of the Herenni, a C. Herennius Optatus and a Herennia Optata are attested at Barcino, whilst the *gens* is also common elsewhere in the region. That they were men of some

<sup>415</sup> cf Ribas, M (1963) op. cit. n. 243 p 30-35; Tchernia, A (1971) op. cit. n. 24 p 61-62; Almagro Basch, M, Serra Rafols, J and Colominas Roca, J (1945) *Carta Arqueologica de Espana: Barcelona* (Madrid) p 132-139.

<sup>416</sup> cf Rico, C (1995) "Índex de les marques epigràfiques sobre tegulae romanes de Catalunya i el país Valencià (antigua Tarraconensis)" in *Saguntum* 28: Homenatge al Professor Dr Miguel Tarradell I Mateu, p 197-215.

<sup>417</sup> cf Tchernia, A (1971) op. cit. n. 24 p 62; Pascual Guash, R (1980) op. cit. n. 325 p 269.

<sup>418</sup> cf Pascual Guash, R (1980) op. cit. n. 325 p 269.

<sup>419</sup> Rico, C (1995) op. cit. n. 416 p 203 has located the source of those stamped MARI at Frejus and believes that those of the Herenni have a similar source.

<sup>420</sup> cf Corsi-Sciallano, M and Liou, B (1985) op. cit. n. 91 p 125.

<sup>421</sup> cf Almagro, M (1952) op. cit. n. 333 n° 207.

<sup>422</sup> *CIL* ii, 6252, 27.

<sup>423</sup> *CIL* ii, 6346, 2-3.

<sup>424</sup> cf Rico, C (1995) op. cit. n. 416 p 202.

status can be seen from C. Herennius Optatus' inscription honouring his friend, Licinius Sura, whilst a M. Herennius Severus was aedile of Iluro.<sup>425</sup> Evidently they were landowners of some substance in the area and it is tempting to view the villa of Torre Llauder as one of their estates in the vicinity of Iluro and that a member of the *gens* engaged in the movement of the produce from their estates seems likely. An Eastern origin and an involvement in commercial activities might be possible for the P. Herennius whose dedication to Serapis survives at Valencia.<sup>426</sup>

A similar function may be attested for the stamps of T. Valerius Rufus which appear on Dr 2-4 and Pascual 1 amphorae from Port-la-Nautique<sup>427</sup> and Vindonissa.<sup>428</sup> The Valerii are a prominent *gens* from Central Italy and they are particularly common in the Iberian Peninsula with a L. Valerius Rufus attested at Barcino and from Salou (Tarragona) an inscription was discovered of a Valerius Rufus who served as *militis frumentarius* of Legio VII Gemina<sup>429</sup>. A T. Valerius Rufus is also attested from Rome.<sup>430</sup> As befits a *gens* as extensive as that of the Valerii, several appear upon amphorae as having been engaged in trade: a M. Valerius Felix is attested as being a *negotiator* engaged in the shipment of fish sauce from Baetica by his appearance in a *titulus* on a Beltr'n IIb amphora from Saint Gervais.<sup>431</sup> The same individual also appears on three amphorae from Pompeii and one from Herculaneum.<sup>432</sup> Perhaps to be related to this enterprise are the M. Valerius Euphemus who is attested on a South Spanish amphora from Castro Pretorio and the M. Valerius Euphiletus on a Dr 20 from Pompeii<sup>433</sup> where a further freedman, M. Valerius Heliadis appears on a Dr 7-13 vessel

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<sup>425</sup> Senatorial status is possible, cf M. Herennius Picens the suffect consul of 34 BC, Proconsul of Asia in 33 BC and father of the suffect consul of AD 1, cf Wiseman, T P (1971) *New Men in the Roman Senate 139 BC - AD 14* (Oxford) p 235 n° 205. Wiseman also cites an M. Herennius Picens as having been a *negotiator* involved in the amphora trade, appearing at Mutina, Rome, Africa, Greece, Spain etc, cf Callender, M H (1965) op. cit. n. 83 n° 1099-1105, Wiseman, T P (1971) op. cit. p 199.

<sup>426</sup> Pereira Menaut, G (1979) *Inscripciones Romanas de Valentia* TV del SIP 64 (Valencia) n° 7: SERAPI / PRO SALUTE P(ublius) / HERENNI SE / VERI CALLINI- / [c]US SER(vus).

<sup>427</sup> cf Bouscaras, A (1974) op. cit. n. 405 p 126.

<sup>428</sup> cf Callender, M H (1965) op. cit. n. 83 n° 1743; cf also Miró i Canals, J (1988) op. cit. n. 22 p 222, Pascual Guash, R (1980) op. cit. n. 325 p 275-276.

<sup>429</sup> cf Pascual Guash, R (1980) op. cit. n. 325 p 276; *CIL* ii, 4170; cf Alföldy, G (1975) op. cit. n. 331 n° 903.

<sup>430</sup> *CIL* vi, 28104.

<sup>431</sup> cf Liou, B and Marichal, R (1978) op. cit. n. 84 p 137: VAR. ATx? / LO or LS / ? / M. VALERI FELICIS.

<sup>432</sup> cf Liou, B and Marichal, R (1978) op. cit. n. 84 p 139.

<sup>433</sup> cf Zevi, F (1966) op. cit. n. 17 p 230.

containing *lymphatum*.<sup>434</sup> It seems likely, therefore, that a *societas* of M. Valerius Felix operated in the shipment of goods between Baetica and Central Italy during the First Century AD with a number of freedmen operating on his behalf at Pompeii and Rome. Although no link can be discerned between the Baetican *negotiatores* and the T. Valerius Rufus operating in Cataluña<sup>435</sup>, the attestation of the family at both Tarraco and Barcino may point to their possession of estates in the vicinity.

A more problematic stamp is that of C. Mussidius Nepos. They are particularly widespread upon Dr 28 amphorae, appearing at Portus Illicitanus<sup>436</sup>, Haltern<sup>437</sup>, Rouen and Rome.<sup>438</sup> The Dr 28 amphorae from Portus Illicitanus appear to have been of a Catalan origin on the basis of comparison with those from Haltern, Tivissa and Oberaden.<sup>439</sup> Such a source is confirmed by the incidence of the same stamp at the wrecksite of Islas Columbretes (Castellon)<sup>440</sup> and at La Longarina, Ostia<sup>441</sup>, where it appears on Pascual 1 amphorae. The location of the original estate in the vicinity of Tivissa may be possible, although no such stamps have been found within the kiln itself: the necks of two Dr 7-11 amphorae have been excavated from Fos-sur-Mer<sup>442</sup>, the first of which bears the stamp TIBISI, and the second C. MUSSIDI NEP(os).<sup>443</sup> The examples from La Longarina and Haltern are dated to the Augustan period, more specifically in the first decades BC and AD. Little is known of the Mussidii although several are recorded as Senators in the Augustan era with a L. Mussidius serving as Proconsul of Sicily. Wiseman cites the Mussidii as having been *negotiatores*, a role for

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<sup>434</sup> cf Zevi, F (1966) op. cit. n. 17 p 232-3: LYMP VET / AIIIA / XVIIIIs / M. VALERII HELIADIS. Callender, M H (1965) op. cit. n. 83 n° 987, records stamps of a L. V(alerius) O(ptatus) from Saguntum at Rome and St Colombe, although I have been unable to find any further trace of this individual within later studies of the amphorae from Saguntum.

<sup>435</sup> A source in Southern France cannot be ruled out.

<sup>436</sup> cf Sanchez Fernandez, Ma J and Llobregad Collado, Ma T (1984) op. cit. n. 308 p 144.

<sup>437</sup> Where the stamp appears variously cited as C. M. USSID(i) NEP(otis) cf Sanchez Fernandez, Ma J and Llobregad Collado, Ma T (1984) op. cit. n. 308 p 144, and MUSS NEP..., cf Miró i Canals, J (1981) op. cit. n. 39 p 338.

<sup>438</sup> cf Beltrán Lloris, M (1987) op. cit. n. 35 p 60.

<sup>439</sup> cf Sanchez Fernandez, Ma J and Llobregad Collado, Ma T (1984) op. cit. n. 308 p 144.

<sup>440</sup> cf Fernandez Izquierdo, A (1982) op. cit. n. 108 p 117.

<sup>441</sup> cf Hesnard, A (1980) "Un depot Augusteen d'amphores a La Longarina, Ostie" in D'Arms, J H and Kopff, E C The Sea-borne Commerce of Ancient Rome: Studies in Archaeology and History MAAR 36 (Rome) p 141-156; Miró i Canals, J (1981) op. cit. n. 39 p 338-339; Fernandez Izquierdo, A (1982) op. cit. n. 108 p 118.

<sup>442</sup> cf Gallia 33, 1975 p 576-577.

<sup>443</sup> The stamp has also been found at Vaison, cf Miró i Canals, J (1988) op. cit. n. 22 p 219.

which I have been unable to find any support beyond their evident role in the production of amphorae.<sup>444</sup> Although a connection with the senatorial Mussidii would point to their having been landowners, the range of attested amphorae upon which the stamps appear would suggest that the scale of operation is greater than mere estate production to satisfy the demands of their own goods. Enhanced status and specialist ceramic production are not, however, to be seen as mutually exclusive: the most well attested example is that of the TT. Mamili, an Equestrian family that engaged in the production of Terra Sigillata Hispanica at Tritium Magallum (modern Tricio).<sup>445</sup>

A possible landowner is the SUL. VEIEN who is attested on Pascual 1 amphorae from the kiln at Llafranc.<sup>446</sup> Amongst the *tegulae* recovered from the site is an example bearing the stamp P. USUL. VEIEN<sup>447</sup> which is undoubtedly associated with the amphora stamp. Unfortunately no epigraphic parallels exist for these stamps and it must remain a supposition that P. Usul( ) Veien( ) possessed estates in the vicinity, if not at Llafranc itself.

Some evidence of the familial structure of the ancient economy may be afforded by the case of Cn. Fulvius Secundus who is attested on Pascual 1 amphorae from Port-la-Nautique, Coutances and Empúries.<sup>448</sup> The *gens Fulvia* is common throughout the Empire but is rarely found in conjunction with the *cognomen* Secundus.<sup>449</sup> The Catalan *gens* have been associated with the Proconsul A. Fulvius Nobilior who campaigned against Numantia in 153 BC<sup>450</sup> although the frequency of the *gens* would tend against such a specific association. Perhaps the most interesting member is the L. Fulvius Numisianus attested from Barcino.<sup>451</sup> The Numisii are particularly common within the region and receive honours in various cities of the Peninsula, particularly in this regard,

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<sup>444</sup> cf Wiseman, T P (1971) op. cit. n. 425 p 199.

<sup>445</sup> The most notable member of the *gens* is T. Mamilius Praesens, cf Haley, E V (1988) op. cit. n. 209; Solovera San Juan, M E (1987) op. cit. n. 175.

<sup>446</sup> cf Badia, J (1966) "Hallazgo de anforas Romanas en Llafranc" in *Empúries* 28 p 265-266; cf Beltrán Lloris, M (1970) op. cit. n. 69 p 193 n° 461. Tchernia, A (1971) op. cit. n. 24 p 56, has raised the possibility that the form is misattributed and should in fact be considered as Dr 2-4.

<sup>447</sup> cf Rico, C (1995) op. cit. n. 416 p 208.

<sup>448</sup> cf Almagro, M (1952) op. cit. n. 333 n° 213; Pascual Guash, R (1980) op. cit. n. 325 p 267-268; Miró i Canals, J (1988) op. cit. n. 22 p 215.

<sup>449</sup> A Fulvius Secundus is attested from Rome, cf *CIL* vi.15639.

<sup>450</sup> cf Pascual Guash, R (1980) op. cit. n. 325 p 268.

<sup>451</sup> cf Mariner Bigorra, S (1973) *Inscripciones romanas de Barcelona* (Barcelona) n° 115.

those at Tarraco and Barcino. They are well known for their commercial activities, particularly for their trading in salt fish products amongst other items from Hispania Citerior. A connection between the two would at least imply aristocratic status for the Fulvii concerned, although it is impossible to discern how close the relationship was between Cn. Fulvius Secundus and the *gens Numisia*.

The Iunii are common within Tarraconensis and may owe their origin to the governors M. Iunius Silanus, the Proprætor of 112 BC and C. Appius Iunius Silanus, the Consul of 28 AD and legate of Tarraconensis in AD 42<sup>452</sup>, the former of whom is recorded on a dedication from Empúries. They are well attested particularly within Tarraco where they served in the local *curia*.<sup>453</sup> A single stamp reading CIVN (C. Iunius) is known on a Tarraconense 1 amphora from Llawaneres.<sup>454</sup> The extreme scarcity of this stamp means that no firm conclusion can be drawn but it is probable that the Iunii are to be included among the landowners of the region. An inscription from Alt Penedes records a Iunia Eutychetus and his daughter Iunia Euthycia.<sup>455</sup> It is possible that Iunius Eutychetus is related to the Eutyches who is attested as a potter on a Lamboglia 2 vessel Grau Vell, Saguntum as well as upon a Dr 20 amphora from Monte Testaccio. The dating of the latter stamp would rule out a connection with that of C. Iunius, but the possibility of a Eutychetus/Eutyches being a freedman of the Iunii engaged in the movement of the produce of the estates of the *gens* cannot be entirely ruled out, although the divergence between the locations of the Catalan inscription and the Baetican and Italian amphora would point against the existence of any such connection.

Much better attested are the stamps of M. Porcius which are widely found over Cataluña and the North.<sup>456</sup> They are particularly common at Baetulo<sup>457</sup> and appear at a number of other sites within the region: Empúries, Can Xammar (Mataró), Tarragona,

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<sup>452</sup> Miró i Canals, J (1988) op. cit. n. 22 p 211.

<sup>453</sup> cf Alföldy, G (1975) op. cit. n. 331 n° 195, 202, 287, 346, 420, 534, 608, 609 and 933.

<sup>454</sup> cf Nolla i Brufau, J Ma (1987) op. cit. n. 61 p 221-222; Pascual Guash, R (1981) op. cit. n° 252 p 240.

<sup>455</sup> cf Fabre, G, Mayer, M and Roda, I (1984) op. cit. n. 401 n° 11; cf also cf Alföldy, G (1975) op. cit. n. 331 n° 534, 933.

<sup>456</sup> For the fullest introduction to this common stamp, cf Roman, Y (1982) "Les amphores de M. Porcius constat d'une divergence et plaidoyer pour une analyse physique et chimique" in Actes du 104e Congrès National des Sociétés Savantes p 81-85.

<sup>457</sup> cf Comas i Sola, M (1985) op. cit. n. 81 n° 30.

Llavaneres.<sup>458</sup> A local origin being confirmed by the limiting of this stamp to Pascual 1 amphorae, whilst it is found with vessels bearing the stamp IULI THEOPHIL in the wrecksite of Cap del Vol (Gerona).<sup>459</sup> Although attested at Pompeii<sup>460</sup>, the principal distribution seem to have centred upon the Narbonne-Bordeaux corridor to the North. A possible route lay along the Rhone to the Rhine frontier at Neuss, being found on Pascual 1 amphorae at Lyon.<sup>461</sup> The examples at Cap del Vol are dated to 30-20 BC<sup>462</sup> whilst those at Vieille-Toulouse are dated to 30-10 BC.<sup>463</sup> He seems, therefore, to have been engaged in the wine trade from Tarraconensis during the final decades of the First Century BC and the frequency of his stamps point to his being a figure of some importance. His enterprise may well have not survived his death as his stamps are striking for not also appearing on Dr 2-4 amphorae.

Although the stamps cannot be directly linked with either a specific kiln or individual, the *gens Porcia* is a common one and its origins within Cataluña may lie with Cato the Censor as governor in 195 BC, and his nephew, C. Porcius Cato, the Consul of 114 BC, who following his exile in 111 BC took refuge in Tarragona, a city for which he was granted citizenship.<sup>464</sup> Their incidence, particularly in the North-East of the province is too widespread to be listed here, suffice it say that they seem to have been a family of some importance both locally, particularly in Tarraco, where we have a Porcius Felix serving as *Vivir*<sup>465</sup>, and in pursuing equestrian careers elsewhere in the Empire, as for example in the cases of M. Porcius Apro[ (?) who served in the East and as *Procurator Augusti ab alimentis* before serving as *Flamen [Divorum Augustorum] (per) provinciae Hispaniae Citerioris*.<sup>466</sup> Similarly an M. Porcius

<sup>458</sup> cf Pascual Guash, R (1981) op. cit. n. 252 p 241-244; on the distribution of M. PORCI stamps, cf Miró i Canals, J (1988) op. cit. n. 22 p 220.

<sup>459</sup> cf Foerster, F (1980) op. cit. n. 292 p 241.

<sup>460</sup> Callender, M H (1965) op. cit. n. 83 n° 1160.

<sup>461</sup> cf Dangreux, B and Desbat, A (1988) op. cit. n. 296 p 121:

<sup>462</sup> cf Foerster, F (1980) op. cit. n. 292.

<sup>463</sup> cf Pascual Guash, R (1980) op. cit. n. 325 p 271.

<sup>464</sup> cf Cicero *Brutus* 34, *Pro Balbo* 11. The association of the Porci with these individuals is raised by Pascual Guash, R (1980) op. cit. n. 325 p 272-274.

<sup>465</sup> cf Alföldy, G (1975) op. cit. n. 331 n° 423: D(is) M(anibus) / PORC(ius) FELIX / V<Iv>ir AUGUST(alis) ET / MAGISTER / [F(ecit)] CORNELIAE / [Vic]TORIAE UXOR[i].

<sup>466</sup> cf Alföldy, G (1975) op. cit. n. 331 n° 300: M. PORCIO M F(ilio) / ANIENS(i tribu) APRO / II VIRO, PRAEFEC(to) / FABR(um), TRIB(un) MILIT(um) / LEG(ionis) VI FERRAT(ae), / PROC(uratori) AUGUST(i) / AB ALIMENTIS / FLAMINI P(rovinciae) H(ispaniae) C(iterioris) / P(rovincia) H(ispania) C(iterior).

Narbonensis rose to be *Praefectus Orae Maritimae*.<sup>467</sup> Although the stamps cannot be linked with a particular member of the *gens*, they clearly possessed estates in the vicinity and one of their number or a freedman thereof was able to profit from the initial expansion of provincial production during the reign of Augustus.

An early date may also be ascribed to the stamps of Sex. Sta(tius) which appear on Tarraconense 1 amphorae from Empúries.<sup>468</sup> The *gens* is not common within the region, but Cicero records a Sextus Staius as a merchant and governor of Cilicia in 51 BC.<sup>469</sup> The family itself is of Central Italian origin.

Despite the existence of legislation intended to curtail aristocratic investment in commercial enterprises, it would appear that the Varronian concentration upon autarchy negated such and that landowners were willing either to produce or purchase amphorae in order to provide a market for their own produce. Some such individuals seem to have formed familial *societates* in order to control the marketing of their produce with the use of freedmen *negotiatores*. Some such *negotiatores* seem to have been free to operate in an independent capacity, both producing amphorae and arranging for their shipment elsewhere. It would appear that some such also engaged in the provision of ships, perhaps as *navicularii*. Not all merchants were also engaged in the production of amphorae and large numbers seem to have purchased both the product and its vessel from the landowner concerned, only playing a role in the shipment of such. This use of a middleman would free the landowners from the stipulations of the Lex Claudia whilst leaving them to enjoy the profits to be garnered therefrom. The volume of production attested within regions such as Cataluña must have been greater than the market requirements of the nearby urban centres leaving considerable opportunities for the onward shipment of cargoes - a role from which, to judge by Trimalchio, considerable profit could be made.

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<sup>467</sup> A curious local military command to control the coastal approaches to Tarraco, cf cf Alföldy, G (1975) op. cit. n. 331 n° 301: M. PORCIO / M F(ilio) GAL(eria tribu) / NARBONENSI / TRIB(uno) MIL(itum) LEG(ionis) XXII, / PRAEF(ecto) ALAE THRAC(um) / HERCLAN(ae), PRAEF(ecto) / ORAE MARITIMAE, / FLAMINI DIVORUM AUG(ustorum) / PROVINCIAE HISP(aniae) CITER(ioris), [p(rovincia) H(ispania) C(iterior)].

<sup>468</sup> cf Almagro, M (1952) op. cit. n. 333 n° 227; Miró i Canals, J (1988) op. cit. n. 22 p 212; Beltrán Lloris, M (1970) op. cit. n. 69 p 191 n° 448; Nolla i Brufau, J Ma (1987) op. cit. n. 61 p 222.

<sup>469</sup> Cicero Ad Att. v, 21.10, vi, 1.

The fullest evidence for the role of merchants comes from *tituli picti* which served as customs records for the goods in transit. As with the producers of the amphorae themselves we appear to be dealing most commonly with freedmen, often of an Eastern origin, although men of a higher social standing also appear. Not only did they operate on their own but a number of *societates* seem to have existed combining the mercantile interests of a particular town or region and familial groupings seem also to have been important. Although the literary allusions to the mean character of the fish sauce merchant are to an extent negated by the social prominence of several such *negotiatores* - perhaps the most notorious being the Pompeian producer and merchant, A. Umbricius Scaurus who decorated the atrium of his house with images of his products<sup>470</sup> - it was evidently viewed not as an end in itself, but as a means to acquiring wealth and thus distinction - one notes the fictional Trimalchio's withdrawal from business and the elevation of the younger Umbricius Scaurus to the *ordo* of Pompeii, serving as aedile and duovir of the town.<sup>471</sup>

The principal source of evidence for these individuals come from the *tituli picti* which, although surviving only rarely, can tell us a great deal about the commercialisation of the individual amphorae. The evidence afforded by them takes a variety of forms, the most important evidence coming from the deposit of Dr 20 amphorae excavated from Monte Testaccio. Rodriguez Almeida has identified five components<sup>472</sup>: the weight of the vessel, the name of the merchant or whoever was responsible for the transport of the amphora, the full weight of the vessel; beneath the handle would be inscribed a variety of fiscal details including the point of embarkation and the consular date; and finally, a number which may pertain to the location of the vessel within the cargo. As well as such utilitarian details, the name of the contents of the vessel would also be recorded should the *pittacum* be lost. Some containers merely provide the essential details, but Curtis has shown that such were widely used as advertising.<sup>473</sup> At this point, however, we are chiefly concerned with the identification of

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<sup>470</sup> cf Curtis, R I (1984) op. cit. n. 5; also Curtis, R I (1988) op. cit. n. 5.

<sup>471</sup> cf Curtis, R I (1988) op. cit. n. 5.

<sup>472</sup> cf Remesal Rodriguez, J (1992) "Instrumentum Domesticum e storia economica: le anfore Dressel 20" in *Opus* 11 fig. 1.

<sup>473</sup> cf Curtis, R I (1984) op. cit. n. 18.

the names attested within *tituli* and attempting to define their role in the commercial transaction.

Three varieties of individual are referred to in this capacity as *navicularii* or *mercatores*: some appear to refer to freedmen, some of whom can be connected with aristocratic families. Others seem to belong to the municipal elites. As well as the names of individuals there are also those of *societates* composed of a number of *negotiatores*, often grouped along familial lines.<sup>474</sup>

Freedmen are widely attested as having operated within the commercial *societates*, several of whom can be associated with prominent aristocratic families such as the *mercator* or *navicularius* Cutius Celsianus<sup>475</sup> who may be related to the Baetican Senator, M. Cutius M. f. Gal. Priscus Messius Rusticus Aemilius Papus Arrius Proculus Iulius Celsus.<sup>476</sup> Bearing in mind the stricture against aristocratic involvement in commerce, the use of freedmen seems to have been common, whether operating on behalf of their patrons or as independent functionaries, perhaps representing the interests of a commercial *societas*. In this regard, we have already referred to a number of individuals who appear to be associated with aristocratic families and are in all probability freedmen.

Amongst the most discussed Tarraconensian merchants are the Numisii who are associated with the production and trade of fish sauce from Carthago Nova. Beltrán Lloris has argued that M. Numisius Nicer and L. Numisius Silo were engaged in this trade, with their freedmen appearing on garum amphorae from Rome.<sup>477</sup> Equally important is the L. Numisius Agathermes who is attested as *Negotiator ex Hispania Citeriore* in Ostia. The Numisii were a family of some prominence in the peninsula holding magistracies in a number of cities, most notably at Carthago Nova and Tarraco.

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<sup>474</sup> cf Curtis, R I (1991) op. cit. n. 5 p 197-200, has established a number of criteria for defining the nature of the names recorded on Campanian fish sauce vessels. Names in the genitive are found to represent the owner or producer of the vessel, the dative case denotes the ultimate recipient of the vessel or an intermediate owner, the use of the ablative preceded by *ab* signifies the consignor of the vessel, the neuter nominative designates a producer or wholesaler of the product, whilst the feminine or masculine nominative refers to the recipient or consumer of the vessel. The abbreviated *tria nomina* appears to identify a further merchant. Unfortunately such extensive *tituli picti* are not found within Tarraconensis and Curtis' criteria cannot, therefore, be applied to the region.

<sup>475</sup> CIL xv.3849.

<sup>476</sup> CIL ii. 1282 a and c, 1283, 1371.

<sup>477</sup> cf Beltrán Lloris, M (1970) op. cit. n. 69 p 597-598; CIL xv. 4708, 4709.

L. Numisius Laetus served as *flamen provincia Hispania Citeriore* at some point during the first half of the Second Century AD<sup>478</sup> and is probably related to the L. Numisius Modestus attested at Tarraco<sup>479</sup>. The *gens* itself is of a Central Italian origin and may have reached the Peninsula in the influx of Italian merchants referred to by Diodorus as having come to exploit the mines of the Peninsula.<sup>480</sup> The organisation of the industrial production of salt fish at Carthago Nova is somewhat problematic. The epithet *Garum Sociorum* which is applied to the produce of the city would appear to indicate the existence of a *Societas* producing and trading the sauce manufactured in the city.<sup>481</sup> Although such is otherwise unknown from Carthago Nova, it has been suggested that the importance of the *garum* produced in the region implies a degree of official involvement, perhaps similar to that which has been envisaged for the production of salt.<sup>482</sup> Its role has been proposed as having been similar to that of the *societas Montis argentarii Ilurconensis*, a mining corporation based in the Sierra Morena. Carthago Nova may thus have possessed a similar primacy over neighbouring fisheries as has been proposed for Gades in the south<sup>483</sup>, although evidence for this is lacking. That there was some imperial involvement in the commercialisation of fish sauce would appear from a *titulus* on a Dr 7-11 amphora from Fos-sur-Mer which reads: [garum] SCOMB(ri) FLOS / AA / [. ]IUNI CILONIS / [e]X OF(ficina) AUGG(ustorum).<sup>484</sup> The trading of the vessel appears to have been in private hands, although the sauce itself would seem to have been produced at an imperial saltery - perhaps recalling the mechanics of the *annona* in which the movement of goods would be granted to private *negotiatores* in return for compensation from the *aerarium Saturni* and immunity from taxation. An inscription from Hispalis of Sextus Iulius Possessor records that the

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<sup>478</sup> cf Ramallo Asensio, S F (1989) *La Ciudad Romana de Carthago Nova: la Documentacion Arqueologica* (Universidad de Murcia) p 89.

<sup>479</sup> cf Alfoldy, G (1975) op. cit. n. 331 n<sup>o</sup> 294, dated to the period AD 140-160.

<sup>480</sup> Diodorus 5.36. On the association of the production of fish sauce with the mining of salt, cf Etienne, R (1970) "A propos du 'Garum Sociorum' in *Latomus* 29 p 297-313. On the organisation of mining, cf Richardson, J S (1976) "The Spanish Mines and the development of Provincial Taxation" in *JRS* 66 p 139-152.

<sup>481</sup> A *titulus* from Pompeii reads *Garum Sociorum* - *CIL* vi, supp. 5659; a number of examples were identified by Dressel from Castro Pretorio, cf *CIL* iv, 5651, xv, 4730.

<sup>482</sup> cf Etienne, R (1970) op. cit. n. 480. The question of salt production and the character of imperial control of this production is discussed in more detail in the appendix.

<sup>483</sup> cf Ponsich, M (1975) "Pérennité des relations dans le circuit du Détroit du Gibraltar" in *ANRW* ii.3 p 655-684.

*navicularii* received a payment for the transport of goods for the *annona*.<sup>485</sup> No other evidence for imperial salteries exists although as we have seen, the Imperial confiscation of property is known within the Peninsula during the First Century AD.

Although the *societas* itself is not attested within Carthago Nova, an inscription dated to AD 10-14 and found at Las Puertas de Murcia in 1875 records a dedication to the duovir C. Laetilius by the guild of *Piscatores et Propolae*. An inscription records the existence of a similar guild from Ostia.<sup>486</sup> Possibly to be related to the production of fish sauces from Carthago Nova are a number of *tituli picti* which record the contents of the amphora as having been *Garum Scombri*<sup>487</sup>; a link with Carthago Nova being shown by its association on a Dr 12 with L. Numisius Silo.<sup>488</sup> The city seems to have been particularly noted for its production of fish sauces made from the Scomber which Strabo says gave the name *Scombraria* to the island off Carthago Nova at which they were caught<sup>489</sup> - the resulting sauces being considered the best in the ancient world.<sup>490</sup> Considering the high repute attached to this variety, it may be the case that the vessels identified as having carried *Garum Scombri* originated from this region, in which case we might also cite the existence of an imperial presence in the commerce of Cartaginensian fish sauce.

Carthago Nova does not, however, seem to have exercised a pre-eminent position over the other salteries of the coast and a number of other *societates* are attested as having been engaged in the trading of fish sauce. A *Corpus Negotiantium Malacitanorum* is attested at Ostia with the *quinquennalis*, P. Clodius Athenio recorded as a *Negotians Salsarius*.<sup>491</sup> Equally within Carthago Nova itself we cannot speak of a monopoly on the part of the Numisii with a number of other names

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<sup>484</sup> cf Liou, B and Marichal, R (1978) op. cit. n. 84 p 131-135.

<sup>485</sup> *CIL* ii, 1180. For the role of the *annona* in the ancient economy, cf Remesal Rodríguez, J (1990) "El sistema annonario como base de la evolución económica del Imperio romano" in *PACT* 27 p 355-367.

<sup>486</sup> *CIL* xiv, 409.

<sup>487</sup> *CIL* xv, 4710; iv, 2588; xi, 4705.

<sup>488</sup> cf Beltrán Lloris, M (1970) op. cit. n. 69 p 244 n° 177.

<sup>489</sup> Strabo 3.4.6; cf also Claudius Ptolemaeus II-6.14, Dioscurides I-54, Galen XII - 634 k.

<sup>490</sup> Strabo 3.4.6; Athenaeus *Deipnosophistae* III.121.

<sup>491</sup> *CIL* vi.9766.

appearing upon garum amphorae from the city: thus A. COR(neli) MOILI is present on a Dr 7/8 amphora.<sup>492</sup>

As with the production of the amphorae themselves, many of the names which appear on *tituli* appear to be freedmen of a Greek origin as, for example, is the case with P. Clodius Athenio.<sup>493</sup> A Pelichet 46 amphora which appears to have contained *Garum Sociorum*, found at Pompeii, bears the name C. Cornelius Hermeros<sup>494</sup>, who seems to have served as a shipper for a number of commodities - wine, fish sauce and Cord(yla).<sup>495</sup>

Similarly attested on Dr 8 amphorae from Rome as having engaged in the trading of Spanish fish sauce is L. Annius Hymnus who is associated with the trade of *Garum Scombri Flos*.<sup>496</sup> The association of a particular producer or recipe of sauce is also attested with the appearance upon a Dr 9 similis containing G(ari) FLO[s] LICINIO[r(um)?] and the name of the shipper L. Terentius Severus.<sup>497</sup>

The involvement of freedmen is well documented outside the Peninsula also with Tib. Claudius Docimus being recorded as a *Negotians Salsamentarius et Vinarius* from Africa who died in Rome.<sup>498</sup> In fact it seems to have been commonplace for Greek freedmen to have been employed as *Negotiatores*, eg. M. Thoranius Euhemerus, Q. Fabius Theogonus, C. Clodius Euphemus, L. Lepidius Hermes and so forth. Unfortunately in many cases it is impossible to identify the patrons of these individuals, although it seems equally probable that freedmen did operate in the movement of goods in their own right.

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<sup>492</sup> cf Beltrán Lloris, M (1970) op. cit. n. 69 p 231 n° 83.

<sup>493</sup> CIL vi.9677: D. M / P. CLODIUS. ATHENIO / NEGOTIANS. SALSARIUS / QQ. CORPORIS. NEGOTIANTIVM / MALACITANORVM. ET / SCANTIA. SUCCESSA. CONIUNXS. EIUS / VIVI. FECERUNT. SIBI. ET. LIBERIS. SUIS. ET / LIBERTIS. LIBERTABUSQUE. SUIS. POTERISQUE/ EORVM / IN FRONTE. P.XIII IN AGRO. P.XII.

<sup>494</sup> CIL iv.5651.

<sup>495</sup> CIL iv.2588, 5683, 5597. In CIL xv. 4691 he appears to have traded G(arum) F(los) LUCR(etianum) which may indicate either a particular recipe or producer of fish sauce.

<sup>496</sup> CIL xv.4692: G(arum) S(combri) F(los) / L. ANNI HYMNI; xiv.4693: G(arum) F(los) / L. A(nni) H(ymni). cf also L. Baebius Anthus on Dr 8 amphorae containing G(ari) F(los).

<sup>497</sup> CIL xv.4690. Also attested on a Dr 8 amphora is M. Aquil[i] Evoc[ati] as having traded in Gar(i) F(los), cf CIL xv.4694.

<sup>498</sup> CIL vi.9676: D.M / TI. CLAUDIUS. DOCIMUS / FECIT SIBI. ET SUIS LIBERTIS / LIBERTABUSQUE / POTERISQUE.EORVM. / NEGOTIANS. SALSAMENTARIUS / ET VINARIARIUS MAURARIUS.

Peter Garnsey has defined independent freedmen in the following terms: firstly, by their possession of wealth, and secondly, by their holding of positions of responsibility in business.<sup>499</sup> Such definitions do not, however, recognise that freedmen would appear to have possessed both wealth and responsibility within the patronal system and the continued obligation of freedmen to their masters is well known. However, freedmen were able to achieve considerable status in their own right, as for example, we see the case of C. Plotius Princeps who dedicated a *cryptam et porticum* at Carthago Nova<sup>500</sup> and several of the freedmen cited above will have operated on their own behalf. Amongst these may be added the L. Iunius Puteolanus recorded on a dedication to Neptune from Suel (Fuengirola, Malaga) who seems to have been engaged in the shipment of salt fish on the basis of the proximity of the inscription to tanks lined with *opus signinum* found at the mouth of the Rio Fuengirola, with the surrounding region also being well provided with salting installations<sup>501</sup>; and the discovery of Dr 12 vessels from Castro Pretorio bearing the *titulus*: G(arum) SC(ombri) F(los) PUTEOLANI.<sup>502</sup> As such a Spanish origin for Puteolanus seems likely, although some commercial contact with his domicile in Italy may have existed. His position as *sevir Augustalis* would also imply a position of wealth and status, thus following the criteria of Garnsey, a degree of economic independence.

Freedmen, therefore, seem to have played an important role in ancient commerce, however, it is clear that, as with other aspects of the commercial process, other social strata are equally represented. Perhaps most problematic are a series of servile names which appear on Spanish amphorae containing fish sauces: Insequens,

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<sup>499</sup> cf Garnsey, P D A (1981) "Independent freedmen and the economy of Roman Italy under the Principate" in *Klio* 63 p 368. Jongman, W (1988) *The Economy and Society of Pompeii* (Amsterdam) p 178, however, asserts that independent freedmen will be less affluent than those operating under the auspices of their patron.

<sup>500</sup> *CIL* ii.3428: C. PLOTIUS. CISSI. L. PRINCEPS / INSULIS. EMPTIS. CRYPTAM / ET/ PORTICUM. D. S. P. FECIT; Beltran, A (1950) "Las lápidas religiosas de Cartagena" in *AEA* 23 p 274 n° 12.

<sup>501</sup> cf Haley, E V (1988) op. cit. n. 209 p 74-75: other installations are known at Torremolinos, Las Bóvedas and Torremuelle or Torre de Benalmádena.

<sup>502</sup> *CIL* xiv.4687-4688.

Artemidorus, Iosippus.<sup>503</sup> However, the incidence of such names appears to have been rare.

More widespread are those names which appear to refer to freeborn individuals. M. Primius Secundianus is attested as *sevir Augustalis* of the *colonia* of Lugdunum, *curator* of a guild of Rhodian *nautae* operating on the Arar, and *negotiator murarius*.<sup>504</sup> In 1970 a number of dedications made by *negotiatores* supplying the Northern frontier were found at Coljinsplaat. The offerings were made to the local goddess Nehalennia by merchants engaged in trade between Gaul, Germania Superior and Britannia during the late Second - early Third Centuries AD. Unlike the south, the Romans attested seem to be citizens and are identified as several varieties of *negotiator*. Two *Negotiatores Allecarii*, L. Secundinius Similis and T. Carinius Gratus, are citizens of an unknown origin but in making a joint dedication to Nehalennia may have been business partners, whilst a third, C. Gatullinius Seggo is of Treverian descent.<sup>505</sup> Attested on a Dr 7 amphora from the Castro Pretorio is a P. Cordius Gratus who is recorded as having shipped MUR(iae) F(los).<sup>506</sup> Gratus seems to have engaged in the shipment of a variety of commodities with his name being found with Mal(acitana) and Sig(ninum) per vet(us) in Dr 7 amphorae from the same site. Although we cannot be certain, these *tituli* would appear to refer to wine.<sup>507</sup> Associated with the former of these is the servile name Domesticus whose role is unknown but may relate to the shipper of the vessel (*navicularius*) or the wholesaler responsible for the sale of the

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<sup>503</sup> CIL xv. 4706: G F / INSEQUENTI. VOLINOXI[ ] ; 4729: MURI(a) ARTEMIDORI; 4731: HAL / IOSIPPI [...]. Perhaps also worth citing in this regard is a Dr 14 vessel which bears the *titulus* LIQ[ / GAMICI[ / ]C[ ], cf CIL xv.4714.

<sup>504</sup> CIL xiii.1966: D. M / ET MEMORIAE AETERNAE / M. PRIMI SECUNDIANI IIIIIIVIR AUG / C.C.C.AUG LUG CURATOR EIUSD. COR / POR NAUTAE RHODANNI ARARE NA / VIGANT CORPORAT INTER FABROS / TIGN LUG CONSIST NEGOTT MURIAR / M. PRIMUS AUGUSTUS FIL ET HERES PATRI KARISSIM PONEND CUR ET SUB ASC DED.

<sup>505</sup> cf Immerzeel, M (1990) "Prodection: Negotiator Allecarius. Fabrication et commerce de sauce de poissons dans le Nord-Ouest de l'Empire Romain" in Oudheidkundige Mededeelingen 70 p 183-192; cf also Hassall, M W C (1978) op. cit. n. 176.

<sup>506</sup> CIL xv.4722. A Gauloise vessel from Fos may perhaps be related to this: the *titulus* reads ...CORDI CALLISTI, cf Liou, B (1987) F 125 p 87.

<sup>507</sup> CILxv.4737, 4740. Beltrán suggests (muria) MAL(acitana). Such a geographical definition is applied only to wine although Gaditana is also cited and some link with fish salting may be possible considering the relative attestations of wine and fish from these two locations. Further to this the use of the epithet *vetus* would suggest a vintage, although both *Garum Flos Scombrum Excellens Vetus*, *Garum Vetus Excellens Antipolitanum* and *Muria Vetus* are attested. The selling of aged sauces may also be indicated by a *titulus* on a Dr 12 amphora from Castro Pretorio which reads: MUR(iae) F(los) / A(nnorum) / IIII / Q. GRANI. IUN... .

sauce at its point of destination. He seems to have been engaged in the commerce of the goods of a number of *negotiatores*, appearing with M. Baebius Claricus and P. Attius Severus on Dr 10 vessels from Castro Pretorio.<sup>508</sup>

A *titulus* upon a Dr 14 amphora from Castro Pretorio records a L. Purellius (or Aurellius?) Gemellus.<sup>509</sup> A. Atilius Macer appears on a Dr 10 amphora from Castro Pretorio<sup>510</sup> where it appears with the servile name Lucanus. The status of these figures is unclear and several of the names cited as freedmen on the basis of aristocratic connections may in fact be freeborn. It does, however, appear that such merchants were able to achieve a degree of social prominence - at least if the best attested examples can be taken as being representative of the group as a whole.

The best studied fish sauce producer is the Pompeian A. Umbricius Scaurus who seems to have possessed a number of dependent workshops and an elaborate residence in *regio* vii, *Insula Occidentalis* 12-15.<sup>511</sup> He may have had commercial interests in Southern Spain with his name appearing alongside that of the *navicularius* M. Valerius Euphemus<sup>512</sup> upon a Spanish amphora. A sepulchral inscription from the Herculaneum gate records that Umbricius Scaurus' son achieved promotion to the aedileship and duovirate presumably on the basis of his father's wealth. The Younger Scaurus is notable, however, for being granted a tomb, 2,000 HS towards his funeral and an equestrian statue in the forum, honours which place him alongside Consulars and Patrons of the city. Such are the honours that it has been suggested that they were in fact intended to honour the elder Scaurus.<sup>513</sup>

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<sup>508</sup> *CIL* xv.4749, 4750. cf also Beltrán Lloris, M (1970) op. cit. n. 69 p 226 n. 48 - Beltrán also cites the appearance of Domesticus with Minucius Rusticus.

<sup>509</sup> *CIL* xv.4719: LIQ(uaminis) FL(os) / EXCEL(lens) / L. PURELLI GEMELLI / M ( ), cf also Pascual Guash, R (1960) op. cit. n. 115 p 205-209 - the *titulus* attested on a Dr 9 amphora from Pecio Gandolfo is similar to that from Castro Pretorio but the identity of the shipper is unclear.

<sup>510</sup> *CIL* xv.4720: L(i)Q(uaminis) F(los) / A. ATIL(i) MACRI / LUCANI.

<sup>511</sup> cf Curtis, R I (1984) op. cit. n. 5; also Curtis, R I (1988) op. cit. n. 5.

<sup>512</sup> cf Curtis, R I (1991) op. cit. n. 5 p 95-96; Manacorda, D (1977) op. cit. n. 118 p 131.

<sup>513</sup> cf Curtis, R I (1988) op. cit. n. 5 p 24. For the inscription, cf p 22. *CIL* x.1024: A. UMBRICIO A F(ilio) MEN(enia) / SCAURO / IIVIR I(ure) D(icundo) / HUIC DECURIONES LOCUM MONUM(ento) / ET HS ∞ ∞ IN FUNERE ET STATUAM EQUESTR(EM) / [in] FJORO PONENDAM CENSUERUNT / SCAURUS PATER FILIO. A further indication of Scaurus' stature is his possible appearance in Petronius *Satyricon* 77.5: *Ad summam, Scaurus cum huc venit, nusquam mavoluit hospitari, et habet ad mare paternum hospitium.* "In fact when Scaurus came he preferred staying here to anywhere else, and he has a family place by the sea." (trans. Loeb ed.). cf Curtis, R I (1988) op. cit. n. 5 p 26-28; Duncan-Jones, R P (1973) "Scaurus at the House of Trimalchio" in *Latomus* 32 p 369.

As well as independent *negotiatores* and freedmen we also see the existence of *societates*, organised both along municipal lines, but also familial - as we have already seen in the case of the Numisii. Otherwise unrelated individuals seem also to have formed corporations as would appear to be the case of L. Secundinius Similis and T. Carinius Gratus. One such firm is attested as having traded in fish sauce from Baetica/Lusitania during the mid First Century AD: a Dr 14 amphora from Fos bears the *titulus*: LIQ(uamen) / EXC(ellens) / SABINI ET AVITI.<sup>514</sup> The two *mercatores* are otherwise unattested.

More important, however, are a number of firms based in Baetica who seem to have been engaged in the shipment of a wide range of goods, not only from the south but also perhaps from the rest of the Peninsula as well. Attested on a Dr 20 amphora from Fos is a *titulus* recording the name AAATI[...]<sup>515</sup> which appears to refer to the Auli Atinii. The Auli Atinii are particularly well attested at Castro Pretorio where they appear upon Dr 20 amphorae bearing oil from Baetica.<sup>516</sup> Their commercial activities were not, however, limited to the oil trade with their name also appearing with vessels containing fish sauces.<sup>517</sup> A Pompeian form VII fish sauce amphora from the site of that name bears the *titulus* ATI[. which may be related to the activities of this *societas*.<sup>518</sup> Although uncertain, it is possible that the A A Atinii were also engaged in the shipment of wine being attested on a Dr 28 amphora from Castro Pretorio.<sup>519</sup> As well as the A A Atinii, two *garum* amphorae from Castro Pretorio bear the *titulus* C C Atinii.<sup>520</sup> Individual members of the *gens* are also attested; from Pompeii a form VII vessel bears the *tria nomina* A. Atinii Crescentis<sup>521</sup> and it has been suggested that the stamp should read M. Atini S[. although this has not been taken up.<sup>522</sup> Little can be said of the *societas*; their appearance on Dr 20 amphorae would point to an origin in Baetica,

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<sup>514</sup> cf Liou, B and Marichal, R (1978) op. cit. n. 84 p 141 n. 32.

<sup>515</sup> cf Liou, B and Marichal, R (1978) op. cit. n. 84 p 112 n. 1.

<sup>516</sup> *CIL* xv.3639-3641.

<sup>517</sup> *CIL* xv.4739, 4744, 4695-4699.

<sup>518</sup> *CIL* iv.2627.

<sup>519</sup> *CIL* xv.4700.

<sup>520</sup> *CIL* xv.4701-4702.

<sup>521</sup> *CIL* iv.5650.

<sup>522</sup> cf Desbat, A, Lequemet, R and Liou, B (1987) "Inscriptions peintes sur amphores: Lyon et Saint-Romain-en-Gal" in *Archaeonautica* 7 p 158.

although comparison with the QQ Caecilii may suggest an Italian origin as would the attestation of the *gens* at Pompeii. Certainly they appear to have had commercial interests in Gaul and Ostia, with an inscription from Arles recording M. Atinius Saturninus as an *apparitor* and shipper<sup>523</sup> whilst a T. Atinas Crescens is present at Narbonne.<sup>524</sup> Perhaps of greater significance is the Atinius who is related in AD 166 to the *codicari naviculari* of Ostia.<sup>525</sup> T. Atinius Felix is recorded with the *dendrophorum Ostiensium*<sup>526</sup> and C. Atinius Atiniarum was a member of the *ordo corporatorum lenuncularior(um) Tabularion(um)* of Ostia in AD 152 although his link with shipping is unclear.<sup>527</sup>

Less widely attested than the above is the *societas* of the QQ Caecilii. They are present on Dr 20 amphorae from Castro Pretorio and upon Dr 9-10 vessels from the same site<sup>528</sup> as well as on a Dr 8 from Lyon.<sup>529</sup> A possible origin in Italy has been suggested<sup>530</sup>, but it seems more probable that they were based in Baetica and engaged in the trading of Spanish goods in the early First Century AD.<sup>531</sup>

Probably related to these stamps are a series which appear upon Dr 20 vessels referring to the Decimi Caecilii who were an important family of *negotiatores olearii* based at Astigi.<sup>532</sup> A Dr 20 vessel from Fos records the name of a freedman, D. Caecilius Abascantus<sup>533</sup> who appears to have operated on behalf of the *societas* of the DD Caeciliorum who appear on Dr 20 amphorae from Fos<sup>534</sup>, Rome<sup>535</sup>, Pompeii<sup>536</sup> and

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<sup>523</sup> CIL xii.718.

<sup>524</sup> CIL xii.6014.

<sup>525</sup> CIL xiv.106.

<sup>526</sup> CIL xiv.2850.

<sup>527</sup> CIL xiv.250. On the Atinii generally, cf Beltrán Lloris, M (1970) op. cit. n. 69 p 223-225.

<sup>528</sup> CIL xv.3646, 4753-4754.

<sup>529</sup> cf Liou, B and Marichal, R (1978) op. cit. n. 84 p 112.

<sup>530</sup> cf Liou, B and Marichal, R (1978) op. cit. n. 84 p 113, on the basis of a *titulus* of CIL xv.4754 which reads: QQ Caecilis / P Mar.....dari / Roma(e?) [...]o Iun[ci]a[no].

<sup>531</sup> The Dr 8 vessel from Lyon is dated to AD 20-30, cf Liou, B and Marichal, R (1978) op. cit. n. 84 p 112 n° 9bis.

<sup>532</sup> On the Caecilii, cf Tchernia, A (1964) "Amphores et marques d'amphores de Bétique à Pompei et à Stabies" in MEFRA p 437-439; Tchernia, A (1981) op. cit. n° 209 p 155-160; S. Panciera (1980) "Olearii" in D'Arms, J H and Koff, E C (eds) The Seaborne Commerce of Ancient Rome in MAAR 36 p 242-245.

<sup>533</sup> Liou, B (1987) p 56 F 82.

<sup>534</sup> Liou, B (1987) p 57 F 83.

<sup>535</sup> CIL xv.3791-3792.

<sup>536</sup> CIL iv.9480.

Amiens. A *titulus* from Rome refers to the freedmen Hospitalis and Maternus<sup>537</sup>, as well as to the *negotiator* L. Aelius Optatus.<sup>538</sup> The relationship of the DD Caecilii to Aelius Optatus is unknown as the definition of the names in *tituli picti* is unclear.<sup>539</sup>

What is most striking about the *negotiatores* attested is their lack of specialisation in the range of products involved - a question resolved in part by the identities of those recorded in *tituli*. Only rarely do such records record the specific role of the individuals concerned and their identification has remained the object of a great deal of controversy. The *navicularius* would appear to coincide on a number of occasions with the proprietor of the ship, with the logical result that they engaged on occasion in the trading of goods from their ships - as perhaps we can see in the case of GEM - and a connection between the two may have been common. Thus the Codex Theodosianus can speak of the conjunction between the two.<sup>540</sup> Strabo speaks of *navicularii* as having engaged in the trading of goods as part of the *annona*<sup>541</sup>, however, Horace refers to such as *mercatores*.<sup>542</sup> Cicero, however, appears to equate the terms with a *navicularius* functioning as a *mercator*.<sup>543</sup> To judge by the statutes enacted against *exercitores* or shipowners in the Digest of Justinian<sup>544</sup>, the shipowner or captain could lease the vessel to a *mercator*, although the definition of legal ownership in such a situation would remain unclear. The latter would, therefore, sell his cargo to a *navicularius* who would be responsible for the shipment of the commodity to its point of demand where its sale would come under the auspices of a *negotiator*. Although some such would seem to have engaged in the commerce of the individual commodities, the definition of a *negotiator* would appear to carry with it a wider commercial involvement. That there was a considerable degree of overlap between the

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<sup>537</sup> CIL xv.3769-3781.

<sup>538</sup> CIL xv.3795: [d] D CAECILIOR(um) / [et l.] AELI OPTATI.

<sup>539</sup> Beltrán Lloris, M (1970) op. cit. n. 69 p 227 n. 56, does not believe the QQ Caecilii to be related to the DD Caecilii who he states as having come from Pompeii.

<sup>540</sup> Codex Theodosianus xiii.v.26: *Comperimus navicularios susceptas species in negotiatoris emolumenta convertere, eo quod abutantur Constantinianae legis indulto, quae his ex die susceptarum specierum concluso biennio securitates reportare permisit....* cf also Digest 4,5,12: *navicularii et mercatorem olearii qui magnam partem patrimoni ei contuderunt, intra a quinquennium muneris publici vacationem habent.*

<sup>541</sup> Strabo 3.2.4.

<sup>542</sup> Horace Ode iii,24,35; cf also Codex Theodosianus 9.32.2.

<sup>543</sup> Verr. 55,137; Manil. 5,9; cf also Tacitus Annals 55.

<sup>544</sup> Digest 14.

various categories of merchants would appear to have been the case with even *magistri* engaging in trade.<sup>545</sup> That each of these are found upon *tituli* would seem to be the case.

That commerce was a profitable concern would be evidenced by cases such as that of Umbricius Scaurus and the Numisii with merchants often rising to positions of wealth and distinction in their communities. The Caecilii seem to have been of importance at Astigi, whilst a Numisia Mercantilla could leave 100,000 HS in her will.<sup>546</sup> C. Aelius Fabianus is attested as having been aedile, duovir and flamen at Corduba.<sup>547</sup> L. Aponius Cherea would seem to have engaged in an extensive trade in the Western Mediterranean being attested as augur, quaestor and aedile of Narbonne, as well as receiving similar honours from several cities in Sicily.<sup>548</sup> L. Numisius Agathermes, the *negotiator*, is attested as *sevir Augustalis* at Ostia. However, although such figures were clearly men of wealth, an involvement in commerce - as evidenced by the tale of Trimalchio - was a risky one and beyond the financial capacity of many of its practitioners who appear to have remained comparatively poor. The essentially small scale of much Roman commercial transactions is shown by the unspecialised nature of many cargoes and for many, the membership of a commercial *societas* was probably a necessity. Some of these were organised along familial lines but many seem to have been grouped according to a specific geographical location or role, although some seem to have been limited to individual merchants as, for example, L. Postumius Pollio, Laetus Niger and Cornelius Lupus.<sup>549</sup> Freedmen appear and it should be noted that many appear to have been of an Eastern origin, although Gauls, Spaniards, Italians and even women are also attested. Many seem to have formed *societates* under the patronage of a local notable as, for example, is the case of the Roman citizens engaged in commerce from Bracara Augusta, who in 42-44 AD made a dedication to their patron C. Castrenius c.f. Camilia tribu Miccio who is attested as *Legatus Augusti (iuridicus) Hispaniae Citerioris, Proconsul Provinciae Baeticae, Praefectus Aerarii*

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<sup>545</sup> *Digest* 14.

<sup>546</sup> cf Beltrán Lloris, M (1970) op. cit. n. 69 p 263.

<sup>547</sup> cf Beltrán Lloris, M (1970) op. cit. n. 69 p 263.

<sup>548</sup> cf Beltrán Lloris, M (1970) op. cit. n. 69 p 265: Syracuse, Thermo, Himera and Panormus.

<sup>549</sup> cf Beltrán Lloris, M (1970) op. cit. n. 69 p 262.

*Militaris* and *Praefectus reliquorum exigendorum populi Romani*.<sup>550</sup> Similarly the community of Eastern *negotiatores* at Malaga was presided over by Tiberius Clodius Iulianus<sup>551</sup> and we have already cited C. Laetilius the patron of the guild of *Piscatores et Propolae* of Carthago Nova.

Not all *negotiatores* were in such a dependent position and several were able to serve as patrons in their own right, as for example is the case of M. Primius Secundinus at Lyon. The *navicularius* Sex. Fadius Secundus is attested as patron of the *Fabri Subaediani*, a firm of interior decorators<sup>552</sup>, whilst P. Olitius Apolonius is recorded as *navicularius* and *sevir Augustalis* at Narbonne.<sup>553</sup>

Although it is not possible to generalise as to the scale of trade in the Western Mediterranean with both small-scale individual operations and aristocratic corporations being attested, it would appear that much of the commercial activity, at least prior to the Severan confiscations, was undertaken on a comparatively limited scale. The requirements of the Roman state, either as taxation, or the *annona* may, however, have caused the growth of long distance trade, to which Strabo<sup>554</sup> attaches considerable profit. The growth of Roman demand and the development of an alternative source of consumption in the form of the Rhine frontier through the *annona militaris* will have encouraged the growth of a more accessible source of supply in the Western Provinces - particularly within Narbonensis and Tarraconensis; a process that is reflected in the appearance of Pascual 1, to which we shall turn shortly.

#### 4. NON-AMPHORA BORNE PRODUCE

Thus far we have spoken almost exclusively of the commerce of fish sauce as evidenced by amphorae, an emphasis that is not inexcusable considering the state of our knowledge. However, the range of exported commodities was far greater, with animal skins and barrels being amongst those vessels used in place of amphorae<sup>555</sup>, whilst over

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<sup>550</sup> CIL ii.2423.

<sup>551</sup> cf García y Bellido, A (1966) "Los 'Mercatores', 'Negotiatores' y 'Publicani'" como vehiculos de Romanización en la España Romana Preimperial" in *Hispania* 26 p 506.

<sup>552</sup> cf Beltrán Lloris, M (1970) op. cit. n. 69 p 265.

<sup>553</sup> cf Beltrán Lloris, M (1970) op. cit. n. 69 p 265.

<sup>554</sup> Strabo 3.2.4.

<sup>555</sup> cf Ponsich, M (1988) op. cit. n. 14 p 55.

shorter distances ceramic or glass *ampullae* appear to have been used. Any understanding, therefore, of the commerce of fish sauce must consider the use of these vessels or of necessity provide a biased interpretation; an interpretation which concentrates upon the vessels used in long distance exchange and ignores those used otherwise will exaggerate the scale and development of the economic unit with a tendency towards the 'modernist' economy as exemplified by Rostovtzeff. The current interpretation of the ancient economy as an essentially regional series of micro-economies only loosely orbiting a larger economic unit, rests upon a recognition of these alternate systems of economic transfer and it is with the application of these to E. Tarraconensis that we are now concerned.

Unfortunately little work has been done on this important aspect of the ancient economy and only in Curtis' work from Pompeii do we possess a reliable picture of the operation of the local fish salting industry. Although well discussed elsewhere<sup>556</sup>, it is perhaps worth expressing the principal pertinent points here. Significantly of 200 vessels from Pompeii and Herculaneum which bear *tituli picti* recording their contents as having been fish sauces, only 36 are amphorae. The remaining vessels are most predominately Pompeian form VI *urcei*. These small vessels take the form of a ceramic, single-handled container with an ovoid body, a long neck with a pronounced lip and a short flat base. In this they are similar to a series of vessels such as *unguentarii* which are included within the generic title *ampullae*.<sup>557</sup> Such vessels were more usually associated with the sale of medicines and perfumes, however, the close relationship of salt fish products to these has led to the supposition that *garum* was also carried in such containers.<sup>558</sup> In spite of competition from imported (amphora-borne) Spanish sauces<sup>559</sup> enough of a market existed to enable the widespread local production and trade of salted fish products, perhaps even attracting a market as far afield as Rome.<sup>560</sup> That

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<sup>556</sup> cf Curtis, R I (1979) "The Garum shop of Pompeii" in *Cronache Pompeiane* 5 p 5-23; Curtis, R I (1988) op. cit. n. 5; Curtis, R I (1991) op. cit. n. 5.

<sup>557</sup> cf Taborelli, L (1992) "Sulle 'Ampullae Vitreae' Spunti per l'approfondimento della loro problematica nell'ottica del rapporto tra contenitore e contenuto" in *Archeologia Classica* 44 p 313-314.

<sup>558</sup> cf Taborelli, L (1992) op. cit. n. 557.

<sup>559</sup> cf Manacorda, D (1977) op. cit. n. 118.

<sup>560</sup> I believe that the incidence of Pompeian fish sauces of Umbricius Scaurus at Fos-sur-Mer is an aberration - a consequence of the provisioning of a Pompeian merchant ship rather than a concerted trade between the two regions, cf Liou, B and Marichal, R (1978) op. cit. n. 84 p 165-167.

Pompeii was unexceptional in possessing such an extensive local trade seems to be a reasonable assumption, although evidence for such is lacking. What appears to have been a *garum* shop has been excavated at Regio i.xii.8 in Pompeii.<sup>561</sup> Within the peristyle of the house were excavated six *dolia* of which five contained remains of *allec*, perhaps having been brought here, decanted and prepared to meet the specifications of individual customers. A parallel to this is perhaps to be located in the Neapolis of Empúries, where what has been traditionally cited as the “Fish Factory” was excavated.<sup>562</sup> The complex consists of a central patio along one side of which are found four basins used in the preparation of the sauces, whilst abutting onto the street is a room believed to be for the sale of the resulting product.<sup>563</sup> Although other fish factories are known from the interior of towns, they tend to be located on the fringes of the urban centres, both perhaps to provide better access to the raw materials and to alleviate the unpleasantness of such upon the populated area. Further to this, the scale of the complex at Empúries may tend to support the view that it could not undertake the primary processing of fish and in all probability it served a function similar to that of the shop at Pompeii. The fish sauce would be brought into the shop, decanted for its final preparation to conform to a particular recipe and then sold in the immediate area. Unfortunately we have no evidence as to what form this sale took, although a localised market would seem likely on the basis of the location of the shop which would entail the use of vessels other than amphorae. Although, as we have seen, the use of barrels is known in Gaul, there is no evidence for such within E. Tarraconensis<sup>564</sup>, rather it would appear that ceramic and glass vessels were used in the local movement of fish sauces.

The use of ceramic vessels in the production of fish sauces is well attested<sup>565</sup>, as they were used to hasten the maturation of the mixture of salt and fish with the application of artificial heat. Such vessels were in all probability produced locally

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<sup>561</sup> cf Curtis, R I (1979) op. cit. n. 556.

<sup>562</sup> The interpretation is not without its critics and I have been unable to consult the original reports of the excavation.

<sup>563</sup> cf Sanmartí Grego, E and Nolla i Brufau, J M (1988) *Empúries* (Barcelona) p 30.

<sup>564</sup> Unlike ceramic and glass artifacts, barrels have a poor survival rate in the archaeological record being attested only in water-logged conditions that are not prevalent within Eastern Spain. Their absence may, therefore, be a consequence of the deficiencies of the archaeological rather than a real one.

<sup>565</sup> cf Chapter 1.

considering the inclusion of kilns and/or ovens within the factory. That these vessels could have been used for short-distance exchange is possible but cannot be reliably attested within the archaeological record. Gabriella Martin noted the presence of indigenous coarse ceramic bowls at Punta de l'Arenal which she considered to have been used in the production of salt fish.<sup>566</sup> Ponsich has noted the appearance of coarse ware forms with the necropoleis adjoining fisheries. These vessels are of a deep bodied form, often for use with a lid and possess a flat, blackened base, perhaps indicating a use for cooking. Such containers could, therefore, have been used for the second, and quicker, method of *garum* production.<sup>567</sup> Cooking vessels are relatively common within the necropoleis associated with fish factories, as are glass *unguentarii* which are also possibly used in the movement of fish sauces. From the necropolis of Muntanyar which adjoins the saltery at Punta de l'Arenal, have been excavated a conical glass *unguentario*, blue-green in colour and conforming to form Isings 58, whilst a small bronze, cylindrical sauce pan and a metal lid which may be associated, have been found in a second tomb.<sup>568</sup> Comparable evidence is lacking from the fishery itself, but a Rigoir 2 vessel found appears to have been a locally produced copy of Palaeo-Christian wares.<sup>569</sup>

A number of globular cooking pots have been found at sites in Alicante and Valencia: Benalúa, Parque de las Naciones (La Albufera), Ermita de Fontcalent, Santa Pola, L'Alcudia de Elche, Villa de la Alcoraya, Baños de la Reina (Calpe), Denia (Hort de Morand) (**fig. 40.1**).<sup>570</sup> The fabric of the vessels is hard and granular, generally red/brown in colour with inclusions of quartz and mica - perhaps originating in Murcia. What is striking about these vessels is their markedly coastal distribution being almost entirely absent from inland sites.<sup>571</sup> They are present alongside Fourth Century African Red Slip (ARS) at Santa Pola, and absent from the Third Century deposits at Tossal de

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<sup>566</sup> cf Martin, G and Serres, Ma D (1970) op. cit. n. 57 p 38.

<sup>567</sup> cf Ponsich, M (1988) op. cit. n. 14 p 61.

<sup>568</sup> cf Bolufer i Marques, J (1986) "La Necropolis del Muntanyar" in *Xabiya* 1 p 116 - Isings 58 vessel from Tomb 15, bronze vessels from Tomb 6. The necropolis is dated to the First-Seventh Centuries AD.

<sup>569</sup> cf Bolufer i Marques, J (1988) "Cerámiques fines tardanes de la Punta de l'Arenal" in *Xabiya* 4 p 41.

<sup>570</sup> cf Reynolds, P (1993) op. cit. n. 57 p 151. Classified as HW 7.1.

<sup>571</sup> It is totally absent from El Monastil and only rare at L'Alcudia.

Manises, thus giving a date in the later Third-Fourth Centuries AD. Although no evidence exists to link these vessels to fish sauce manufacture, their coastal distribution may point to a function associated with such, whilst their appearance at a number of fish factories within the region may support this conjecture.

A similar function might be envisaged for Reynolds W1.18 vessels (**fig. 40.2-5**).<sup>572</sup> These take the form of a single-handled mixing bowl, generally globular in shape with a spout on the shoulder of the vessel. Variations of this form date back to the early Imperial period being found in a pre-Third Century context at L'Alcudia, Elche. They are widely found in the Western Mediterranean<sup>573</sup>, and a similar form, Rigoir 29 was produced in Southern Gaul in the Fifth-Sixth Centuries AD. Reynolds has noted the existence of four variants of this form: type A is a globular vessel with an angular rim which appears to be of a Visigothic date on the basis of finds from L'Alcudia. Type B is similar to the above but possesses a more horizontal rim and is probably a variant of type A.<sup>574</sup> Type C is also found at Benalúa and consists of a carinated body, a pronounced shoulder and rolled rim. Type D possesses the same body shape as this form but is surmounted by a vertical rim. The situation of all three at Benalúa points to a date in the Fifth Century AD. Little can be said as to the origin of these vessels: their fabric is ochre in colour with inclusions of red ochre, lime and quartz. As such it is too indistinctive to be securely ascribed to a particular region, although it is identical to that of locally produced Dr 2-4 amphorae.<sup>575</sup>

The function of these bowls is unclear but it is evident that they were used to mix and pour a liquid of some kind, perhaps fish sauce?<sup>576</sup> Similar spouted vessels have been found at Carteia where they are associated with Iberian and Campanian pottery of a Republican date.<sup>577</sup> The proximity of the fish factory would suggest a similar function.<sup>578</sup>

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<sup>572</sup> cf Reynolds, P (1993) op. cit. n. 57 p 104-105.

<sup>573</sup> Vilaroma, Ibiza, Ventimiglia, Menorca, Mallorca, Morocco and Tarragona.

<sup>574</sup> from Avenida Oscar Esplá (Benalúa, Alicante).

<sup>575</sup> cf Reynolds, P (1993) op. cit. n. 57 p 101.

<sup>576</sup> cf Reynolds, P (1993) op. cit. n. 57 p 104.

<sup>577</sup> cf Woods, D E, Collantes de Terán y Delorme, F and Fernández-Chicarro y de Dios, C (1967) *Carteia* EAE 17 (Madrid) p 36-37.

<sup>578</sup> cf Woods, D E, Collantes de Terán y Delorme, F and Fernández-Chicarro y de Dios, C (1967) op. cit. n. 577 p 23-27.

Similarities exist between the coarse ware deposition at Almuñeçar and Cotta which may suggest a use associated with the fish factories located therein. Amongst the vessels attested are the rims of a number of coarse ware bowls lacking any typological or morphological uniformity.<sup>579</sup> Also found from the site of Almuñeçar are a number of necks and handles of small globular jugs with a generally striated external face.<sup>580</sup> Although no indication of their use exists they are found in levels associated with three tanks lined with *opus signinum* and which were used in the preparation of fish sauce, the largest being found to contain a layer of fish remains.<sup>581</sup> The ceramic deposits found resemble those of N. African sites with Terra Sigillata Clara D being abundant, the assemblage being dated to the Fourth Century AD. A number of grey ceramic cooking vessels have been found. They are characterised by a broad mouth and body with a single handle attached to the lower section of the lip, recalling similar vessels found at Punta de l'Arenal and elsewhere.<sup>582</sup>

Well attested within the ceramic deposits associated with fish factories and their adjoining necropoleis are *ampullae* and *unguentarii* which, as we have seen at Pompeii, can be associated with the movement of fish sauce. Vessels similar to Pompeian VI *urcei* have been found at a number of fisheries within E. Tarraconensis and are worth citing here as possibly serving a similar function to the Pompeian vessels. A single handled *spatheion* was recovered by Rico Garcia from his excavations at Benalúa<sup>583</sup> and has also been found at the Baños de la Reina at Calpe (**fig. 39.1**). These vessels possess a tapering body with a single handle abutting onto a narrow neck. The lip is elongated, deep and conical in profile. They date from the Fourth-Fifth Centuries AD and although we have no evidence as to their function, the limited incidence of this form in the fisheries at Benalúa and Calpe may suggest a role in some way connected with this industry.<sup>584</sup> The fabric is buff and granular in appearance with red/brown-black inclusions of iron oxide, quartz and lime. A similar fabric is attested within the

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<sup>579</sup> cf Sotomayor, M (1971) "Nueva factoria de salazones de pescado en Almuñeçar" in *NAH* 15 p 153 nrs 15-27.

<sup>580</sup> cf Sotomayor, M (1971) op. cit. n. 579 p 171-172.

<sup>581</sup> cf Sotomayor, M (1971) op. cit. n. 579 p 167-168.

<sup>582</sup> cf Sotomayor, M (1971) op. cit. n. 579 p 75; Martin, G and Serres, Ma D (1970) op. cit. n. 57 p 38, 54 fig. 28; Ponsich, M (1988) op. cit. n. 14 p 55.

<sup>583</sup> cf Reynolds, P (1993) op. cit. n. 57 p 128-129, W3.16.

<sup>584</sup> An unprovenanced example is preserved at Elche.

vessels produced at the villa of la Ermita de Fontcalent which may suggest a local source, although it also appears in Baetican amphora forms.<sup>585</sup> A similar fabric has been identified in a number of coarse ware vessels excavated from the cisterns of the fish factory at Santa Pola (fig. 39.2).<sup>586</sup> They date to the Fourth Century AD and appear to have been used in the heating of the fish sauce, being blackened on the outside.<sup>587</sup>

It seems reasonable to associate a number of coarse ware forms found on sites with the processing of fish sauce and in some cases, as with the incidence of strainers at Carteia and Benalúa, this hypothesis is assured. One would expect that such unspecialised forms would have been locally produced, however, the extent to which such strainers were exchanged is striking with a Palestinian example having been found at Marseilles.<sup>588</sup> Even so, the extent to which these vessels were used in trade is impossible to quantify. That ceramics were exchanged within the confines of the region is beyond doubt - Figueras Pachero records the abundance of Mesetan pottery within the Roman levels at Isla de Campello.<sup>589</sup> A number of locally produced jugs and small amphorae have been found distributed within the hinterland of Tarraco and may relate to this form of exchange.<sup>590</sup> Although these vessels cannot be attributed to a specific

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<sup>585</sup> cf Reynolds, P (1993) op. cit. n. 57 p 126-127.

<sup>586</sup> cf Reynolds, P (1993) op. cit. n. 57 p 128, W3.6.

<sup>587</sup> A number of jars have been excavated from the Punic necropolis of Cerro de San Cristóbal (Almuñechar) - tombs 12, 13, 19, 20 - cf Pellicer Catalan, M (1962) Excavaciones en la necrópolis púnica 'Laurita' del Cerro de San Cristóbal (Almuñechar, Granada) EAE 17 (Madrid) p 20, 22, 38 and 40, however, I can cite no link with the processing of fish sauce and they are better viewed as imported vessels from the Near East.

<sup>588</sup> cf Reynolds, P (1993) op. cit. n. 57 p 143.

<sup>589</sup> cf Figueras Pachero, F (1934) Excavaciones en la Isla del Campello (Alicante 1931-1933) JSTA 34 (Madrid) p 23. On the exchange of pottery within the region as a whole, cf Aguarod Otal, (1991) Cerámica Romana importada de cocina en la Tarraconense Institución Fernando el Católico 1281 (Zaragoza); on that of Terra Sigillata, cf Mezquiriz de Catalan, M (1961) op. cit. n. 266.

<sup>590</sup> cf Carreté, J Ma, Keay, S J, Millett, M (1995) A Roman Provincial Capital and its Hinterland: The Survey of the Territory of Tarragona, Spain, 1985-1990 JRA Supp. Ser. 15 (Ann Arbor) p 141 type 4, a small jar or amphora characterised by a pronounced everted rim, with a wide, undifferentiated scattering of vessels and no indication of date. Type 5 found at the villa of La Creu de Salom / Mas de Serapi, Constantí was the rim of a jar or small amphora, 'S' shaped in profile. The fabric is hard and buff coloured with few inclusions of lime and ironstone, and is probably of a local origin. p 15 type 6, a rim and handles of a jug of unknown type recalling those from Puig Rodon which are dated to the Third Century AD. The fabric is hard and rough with a fine orange clay. There are moderate inclusions of quartz, felspar, limestone, hornblende, mica and granite, and it seems likely that it originated locally. p 141 type 2, consists of a single-handled jug with an ovoid rim which has been found at the villa of El Munts and may be early imperial in date. A bottle form with an ovoid rim and single handle has been found in a number of Tarraconensian contexts, including the Circus at Tarragona. Parallels in Girona point to a date in the post-Augustan period. An undated, everted rim of a small amphora was excavated from site 2.3, as was a more triangular rim which appears to belong to

origin their diffusion within the region is the consequence of the existence of localised trade routes to which those of the fish sauce vessels must be added.

Without a greater quantification of coarse ware types, it is impossible to gauge the scale of this activity. Amongst the site reports used in this study, I have been unable to discern evidence for the exchange of fish sauces with the *villae* in the immediate hinterland through the use of coarse ware vessels. Even so, the evidence would appear to support the hypothesis that Pompeii is not exceptional in possessing an important local market for fish sauce. Coarse vessels were used in the manufacture of fish sauce, some of whom at least were produced locally. As such it would have been probable that these containers will have been employed in the local movement of goods. Although its importance cannot be reliably quantified, the existence of these patterns of distribution must be borne in mind when we consider the extent of ancient commerce.

## 5. MECHANISMS OF COMMERCE

The amphora production of Tarraconensis is characterised by the wide range of kilns and of forms attested. Much of this production seems to have been based within the villa economy and centred upon a series of urban commercial *emporía* - Empúries, Barcino, Iluro, Barcino, Tarraco, Dianium, Portus Illicitanus, Tossal de Manises, L'Albufereta and Carthago Nova to name but the most important. Such centres provided outlets both for the exchange of goods into and out of the region as well as resources for the movement of goods beyond the province. The distribution of the amphorae employed in this exchange can, therefore, be used to provide an indication both of the scale and direction of commercial contact. Much exchange was, however, unrelated to the use of amphorae, both in the purely localised movement discussed above, but also in the bulk movement of non-liquid commodities and in the use of other forms of containers such as barrels and skins. In this regard notice must be taken of the existence of 'Secondary Cargoes' and the use of such to define the exchange of goods otherwise undetectable in the archaeological record.

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a small jug and is perhaps Imperial in date. A similar chronology is assigned to a circular, everted rim of a small amphora identified from site 4.4. The fabric of these vessels is fine, hard and pink in colour. It is characterised by regular inclusions of quartz and limestone, mica and calcite are also more scarcely attested.

Amongst the most widely attested finds are those of fine ware pottery such as *Terra Sigillata* which provides an indication of commercial contact otherwise undetected.<sup>591</sup> Although commonplace within the archaeological record, there does not seem to have been a trade in fine ware pottery in its own right - the wide distribution that these wares were able to achieve was rather the consequence of the other economic activities of the region - through which fine ware producers would have been able to gain access to otherwise closed markets. Pottery would be stowed as a supplement to the primary cargo of the vessel, its exchange being dependant upon that of the wider commodity.<sup>592</sup> Thus we see in the first two Centuries BC that the distribution of Italian ceramics is widespread being widely attested at a number of sites in E. Tarraconensis - coincident with Italy's dominance of overseas trade in bulk commodities carried in Dr 1 and Lamboglia 2 amphorae.

Similarly the diffusion of African Red Slip (ARS) coincides with the increased African dominance of oil exports and the incidence of kilns producing Africana Piccole oil amphorae in the areas of Neapolis, Hadrumentum, Leptis Minor and Sullectum in the mid Second Century AD.<sup>593</sup>

We have already spoken of the diffusion of Punic amphora forms dating as early as the Sixth Century BC: it is during the early Second Century BC, however, that we see the arrival of Italian imports<sup>594</sup> with Republican I amphorae attested at Torre de la Sal (Cabanes, Castellon)<sup>595</sup>, Tossal de Manises, Lavezzi dated to 130-100 BC, and those from Antheor dated to 170-130 BC.<sup>596</sup> This trade is further evidenced by the

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<sup>591</sup> Recently John Hawthorne has argued against the use of fine wares as an economic indicator and suggested that changes in the patterns of distribution of particular forms is a consequence of changes in eating habits rather than a result of economic criteria, cf Hawthorne, J (1996) "Commensalism and common sense: a new approach to archaeological ceramics" in *Assemblage 1*.

<sup>592</sup> Pucci suggests that the primary cargo of the Riou 1 wreck was pottery, cf Pucci, G (1983) "Pottery and Trade" in Garnsey, P D A, Hopkins, K and Whittaker, C R (eds) *Trade in the Ancient Economy* (Berkeley) p 111.

<sup>593</sup> Africana Piccole begin to appear in sites of the W. Mediterranean in the period 160-180 AD, cf Caradini, A (1983) "Pottery and the African Economy" in Garnsey, P D A, Hopkins, K and Whittaker, C R (eds) *Trade in the Ancient Economy* (Berkeley) p 149

<sup>594</sup> A degree of caution is worth noting in the attribution of all such cargoes to an Italian origin. It may be found that some originated elsewhere, cf the cargo of Greco-Italic amphorae at La Ciotat A which may have originated in NE Spain on the basis of associated ceramic finds, cf Parker, A J (1992) op. cit. n. 4 p 144-145 n° 312.

<sup>595</sup> cf Wagner, J (1978) "El Yacimiento Submarino de Torre la Sal, Cabanes (Castellon)" in *CPAC* 5 p 306.

<sup>596</sup> cf Wagner, J (1978) op. cit. n. 595 p 308.

appearance of Campanian A wares produced in the area of Naples which begin to appear in the Peninsula in the Second Century BC and are particularly evidenced at Empúries c150 BC<sup>597</sup> where Proto-Campanian wares are evidenced as early as 250-225 BC.<sup>598</sup> The frequency of Campanian A wares over B at the site may be a consequence of Cato's presence in the vicinity in 195 BC. Similarly Tarraco imported Campanian A and other fine ware forms by the mid Second Century BC.<sup>599</sup> The association between the army and commerce is well attested and the conquest of the Peninsula will have provided Italian goods with a valuable resource and market. Thus Diodorus speaks of the influx of Italian merchants in the Second Century BC to exploit the mineral resources of the Peninsula<sup>600</sup> and this would appear to reflect a wider trend of Italian immigration during this period.<sup>601</sup> Defining the origin of families within the Peninsula is difficult as the coincidence of *gentes* may not relate to direct immigration and the epigraphic evidence available is most abundant in the Second Century AD. That Italian merchants did arrive within the Peninsula during the Second Century BC would appear to be the case - one should note the Etruscan origin of the Numisian *gens* and a particularly close relationship may have existed between Tarraconensis and Campania.

Commercial contacts seem to have increased towards the end of the Second Century BC with the abundant presence of Dr 1 amphorae transporting wine from the region of Pompeii. They are present within the wrecksite of Torre de la Sal (Cabanès, Castellón)<sup>602</sup> dated to the period 175-75 BC. Dr 1 B and C forms have been found off the coast of Benicarló<sup>603</sup> whilst their presence at Azaila must date to the early First Century BC. Those from the wrecksite of Piedras de la Barbada (Benicarló) are dated to the late Second - early First Century BC.<sup>604</sup> The Dr 1 A amphorae from Benicasim,

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<sup>597</sup> cf Nieto Prieto, F J and Nolla i Brufau, J Ma (1985) op. cit. n. 107 p 146.

<sup>598</sup> cf Pena, M J (1992) p 65; cf also Sanmartí Grego, E (1978) La Cerámica campaniense de Emporion y Rhode vol 2 (Barcelona) p 610-611.

<sup>599</sup> Nieto Prieto, F J (1993) "De la Dragendorff 29 a la Hayes 8: consideraciones sobre el comercio marítimo en los siglos I y II d C" in Cypsela 10 p 77-85.

<sup>600</sup> Diodorus 5.37.

<sup>601</sup> On immigration, cf Haley, E V (1991) op. cit. n. 221; Marin Diaz, Ma D (1988) op. cit. n. 221.

<sup>602</sup> cf Wagner, J (1978) op. cit. n. 595 p 315.

<sup>603</sup> cf Ribera Lacomba, A and Ripolles Alegre, P (1977) "Anforas de Benicarló y su zona costera" in CPAC 4 p 166.

<sup>604</sup> cf Fernandez Izquierdo, A (1990) "El yacimiento de 'Piedras de la Barbada' (Benicarló, Castellón). Campaña 1989" in CPAC 15 p 405. A similar context is attested at Oropesa, Benicasim and Almazora.

Punta Escalleta and La Ciotat are dated to 150-140 BC and the form is abundant at a number of wrecksites along the South Coast of France - Dramont A and Cap l'Esterel; they appear in contexts dated to c100 BC at Grand-Ribau A and Baie de Cavalière.<sup>605</sup> Unlike Dr 1 A and C, Dr 1 B are more isolated and do not appear to have been traded within the region in any quantity.<sup>606</sup>

Although Italian wine, as attested by Greco-Italic and Dr 1 amphorae achieves a dominance of the market of the Western provinces during the last two Centuries BC, the trade in other Italian products appears to have been more limited.<sup>607</sup>

This trade seems to have concentrated upon the more Romanised provinces in the North-East of the Peninsula and some supply of the Roman forces based at Emporiae and Tarraco in the early Second Century BC is likely.<sup>608</sup> Cataluña seems to have seen the establishment of a Romanised pattern of villa settlement from the mid Second Century BC and it is possible that the early growth of Romanised centres at Baetulo and Emporiae was in part a consequence of the need to distribute commodities to and from these *villae*.<sup>609</sup> It has, however, been suggested that the late Second Century BC saw the replacement of the Iberian agrarian structure with the more Romanised villa system based upon a series of urban centres such as Baetulo and Iluro which seem gradually to have replaced the pre-existing Iberian centres.<sup>610</sup> A number of these centres such as Cabezo de Alcalá, Ullastret and so forth seem, however, to have remained in occupation until the mid First Century BC and to have been abandoned as a consequence of the civil wars and not on purely economic motives. Recent survey work has shown that these communities received Italian imports comparable to those of the urbanised Roman centres<sup>611</sup> and it is perhaps premature to speak of the eclipse of the

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<sup>605</sup>cf Fernandez Izquierdo, A (1982) op. cit. n. 108 p 116.

<sup>606</sup> cf Fernandez Izquierdo, A (1982) op. cit. n. 108 p 116.

<sup>607</sup> Brindisian amphorae carrying oil have been found at Valencia and Santa Pola, cf Fernandez Izquierdo (1984) op. cit. n. 45 p 98 - dated to the late First Century BC-early First Century AD.

<sup>608</sup> cf Richardson, J S (1996) *The Romans in Spain* (Oxford) has argued that Italian immigration and Romanisation taking place at this time was a consequence of the Roman military presence rather than a direct policy of occupation.

<sup>609</sup> Baetica seems to have only begun to develop a Romanised pattern of settlement in the second half of the First Century BC - perhaps a consequence of the sustained fighting that took place in the South and East of the Peninsula both during the Sertorian war and the campaigns of Caesar in 49-45 BC.

<sup>610</sup> cf Prevosti, M (1991) op. cit. n. 168 p 139.

<sup>611</sup> cf Carreté, J Ma, Keay, S J, Millett, M (1995) op. cit. n. 590.

pre-Roman systems of exchange, rather they seem to have co-existed for a period during the Second - First Centuries BC.

By c80-70 BC, however, the villa economy was sufficiently well established in the region to see the beginning of the production of Dr 1 Laietana forms carrying locally produced wine. This wine seems to have been intended for a purely local consumption being found almost exclusively within Cataluña, a situation which continues through the mid-First Century BC with a similarly limited distribution of Tarraconense 1 forms.<sup>612</sup> Some trade to the North is possible with the appearance of examples at Toulouse, Agen and Vienne. Abundant Italian imports, however, show the continued dominance of provincial markets by Italian goods during the First Century BC.

Late in the First Century BC, however, there appears to be a shift with a decline of Italian products in favour of provincial goods, particularly attested by the incidence of Pascual 1. The change seems not to have been an immediate one but rather the culmination of the more gradual Romanization with those regions such as Cataluña engaging in the production of Pascual 1 vessels, whilst those to the south do not seem to have participated in this economy. It is significant that several of the potters attested on Dr 1 Laietana and Tarraconense 1 also appear on Pascual 1 amphora such as L. Volteilius from El Sot del Camp.<sup>613</sup> The immediate cause of the development of an interprovincial exchange of Tarraconensian products would appear, however, to be linked with the politico-military situation of the Augustan era.

Pascual 1 amphorae possess a wide distribution across much of North-Western Europe reaching Southern Britain and the Rhine frontier. The dramatic increase in their incidence over a comparatively short space of time must reflect a comparable increase in vine cultivation as well as the operation of more localised mechanisms of exchange bringing the wine from points of production to those pertaining to the supply of amphora with the expansion of entrepôts such as Iluro and Baetulo being a corollary of this development. Nieto has recently suggested that exchange took place through the media of primary and secondary ports<sup>614</sup> citing in this regard the relationship between

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<sup>612</sup> cf Miró i Canals, J (1988) op. cit. n. 22 p 120-123; Nolla i Brufau, J Ma (1987) op. cit. n. 61 p 219.

<sup>613</sup> cf Miró i Canals, J (1988) op. cit. n. 22 p 213-214.

<sup>614</sup> cf Nieto Prieto, F J (1993) op. cit. n. 599 p 77-85.

Empúries and Marseilles. Long distance exchange, therefore, would concentrate upon a number of large scale urban centres from which products would be shipped out to secondary ports by smaller coastal vessels enabling a more focused distribution of goods. Thus a number of centres in E. Tarraconensis, such as Carthago Nova, seem to have acted as redistributive centres for smaller ports - an hypothesis which may go some way to explaining the comparative absence of amphora deposits within Castellon. Also important is the coincidence of the distribution of Tarraconensian stamps with several being identified within the same deposits: as for example, we see at Neuss where SEX.DOMITI, M.PORCI and TIBISI appear; most notable is the distribution of finds at Port-la-Nautique which appears to have operated as a nodal point for exchange up to the Rhône valley.<sup>615</sup> This lack of a monopoly on the part of any single producer is matched by the lack of such exercised by Tarraconensian products as a whole.

The exportation seems to have been geared towards the supply of Northern markets with a marked concentration of Pascual 1 finds along the coasts of Southern France extending up the Rhône/Garonne corridors to the North. Particularly important seems to have been the Garonne from which vessels reached Cape Finistere with particular concentrations of amphorae at Vieille-Toulouse and Quimper.<sup>616</sup> From this point the amphorae reached southern England, particularly Dorset and Hampshire, where Hengistbury Head seems to have been an important redistributive centre to the neighbouring sites, although by the early First Century AD the principal point of entry for goods into the island seems to have shifted to Kent.<sup>617</sup> Vessels seem also to have reached a number of Augustan bases along the lower reaches of the Rhine: Neuss, Xanten, Haltern and Holsterhausen.<sup>618</sup> The lack of finds from bases along the upper reaches of the Rhine is striking and points to the Atlantic trade-routes over the Rhône-Rhine. Those of the Rhône are particularly concentrated at Lyon and Vienne from

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<sup>615</sup> cf Bouscaras, A (1974) op. cit. n. 405 p 109-114: SEX.DOMITI, TIBISI, M.PORCI, CN.LENTULI AUGURIS, CN. FUL. SEC, C. MUSSIDI NEP, ...I. FULVI, IULI THEOPHIL, QFS, RUG.

<sup>616</sup> On the distribution of Pascual 1 amphorae, cf Miró i Canals, J (1988) op. cit. n. 22 p 123 - 143; cf also Fitzpatrick, A (1985) op. cit. n. 23.

<sup>617</sup> cf Cunliffe, B (1988) Greeks, Romans and Barbarians (London); Millett, M (1991) The Romanization of Britain (Cambridge).

<sup>618</sup> cf Miró i Canals, J (1988) op. cit. n. 22 p138-139; Ettliger, E (1977) "Aspects of amphora-typology seen from the North" in in Methodes Classiques et Methodes Formelles dans l'étude des amphores p 9-16.

which the route appears to have followed the Loire to the sea. An interpretation of the destination of these vessels is hampered by the concentration upon amphora deposits in an urban context. The relationship between urban centres and their rural hinterland is consequently impossible to discern. Pascual I amphorae are almost entirely lacking from native settlements along the Rhine frontier and within Gallia Belgica pointing to their use specifically to satisfy the requirements of the military garrison without any subsequent redistribution. Revilla Calvo<sup>619</sup> has suggested that this economic focus is particularly related to a number of kilns located in the Ebro valley which seem to have maintained close economic relations with the Rhine bases with the produce of l'Aumedina attested at Neuss, Oberaden, Dangstetten, and that of Mas del Catxorro at Haltern.

This concentration upon the satisfaction of a specific demand, namely the *annona militaris*, would seem to have provided the impetus behind the growth of Tarraconensian wine production in the late First Century BC. The focus of Dr 2-4 production, however, shifts towards the supply of Italy with particular concentrations of amphorae at Pisa, Settefinestre, Ostia and Rome.<sup>620</sup> Concentrations of wrecksites containing Dr 2-4 point to the Gulf of Lyon and the Balearics - Straits of Bonifacio as having been the principal routes by which these vessels reached Rome.<sup>621</sup> The frequency of the finds of Dr 2-4 points to a large-scale expansion of Tarraconensian wine production in the Julio-Claudian - Flavian periods. Whereas earlier amphora production is confined to Cataluña, we now see the opening up of the regions to the south with kilns identified at Orley<sup>622</sup>, Saguntum<sup>623</sup>, Oliva<sup>624</sup>, Daimuz, Potries, Oliva, Ondara, Jesus Pobre<sup>625</sup>, L'Almadrava<sup>626</sup>. The majority of the wrecksites so far attested seem, however, to come from the North-East, particularly in the area of the Baix

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<sup>619</sup> cf Revilla Calvo, V (1993) op. cit. n. 76 p 165.

<sup>620</sup> cf Miró i Canals, J (1988) op. cit. n. 22 p 151-152.

<sup>621</sup> cf Corsi-Sciallano, M and Liou, B (1985) op. cit. n. 91.

<sup>622</sup> cf Beltrán Lloris, M (1987) op. cit. n. 35 p 58; Aranegui Gasco, C and Mantilla Collantes, A (1987) op. cit. n. 33 p 101; Fernandez Izquierdo, A (1982) op. cit. n. 108 p 118-119.

<sup>623</sup> cf Aranegui Gasco, C and Mantilla Collantes, A (1987) op. cit. n. 33.

<sup>624</sup> cf Enguix, R and Aranegui Gasco, A (1977) op. cit. n. 33; Aranegui Gasco, C (1981) op. cit. n. 33 p 531; Gisbert Santonja, J A (1987) op. cit. n. 33 p 106-107.

<sup>625</sup> cf Gisbert Santonja, J A (1987) op. cit. n. 33 p 107-108.

<sup>626</sup> cf Gisbert Santonja, J A (1987) op. cit. n. 33 p 109; Abascal, J M and Gisbert Santonja, J A (1991) op. cit. n. 33 p 135-136; Reynolds, P (1993) op. cit. n. 57 p 83.

Llobregat, thus we see, for example, at La Chrétienne H that 21% of the cargo originated at the kilns of Can Pedrerol and Can Tintorer.<sup>627</sup> Scatters of Dr 2-4 amphorae at El Saler<sup>628</sup>, Burriana and Ben-Afeli<sup>629</sup> point to the inclusion of the SE litoral in this exchange - a role confirmed by the identification of a number of wrecksites along the coast containing Dr 2-4, as at San Ferreol (Cabo de Palos, Cartagena)<sup>630</sup> and Benicarló<sup>631</sup>: however, the distribution of amphorae in the vicinity is scattered and does not point to their having composed the entire cargo of these vessels. Fernandez Izquierdo has suggested<sup>632</sup> that such individual finds of amphorae were the consequence of the off-loading of cargoes from merchant ships to smaller coastal vessels for their distribution along the coast. Such redistributive processes are alluded to on a number of occasions with goods being brought to the primary harbour and transferred to smaller barges for movement beyond, as for example, seems to be the case at Riells-La Clota.<sup>633</sup> Nieto has suggested that such can be identified from the relative composition of the cargo of the vessels with direct trade between primary ports being characterised by homogenous cargoes composed of products from the same point of origin although it does not imply a unity of products. Routes of redistribution on the other hand are characterised by a heterogenous cargo composed of commodities drawn from a variety of regions as, for example, we see at Culip IV and Benicarló.<sup>634</sup> Particular concentrations of amphorae, therefore, as at Riells-La Clota, Ben-Afeli, El Saler and Cabo de Palos may have served as redistributive centres within the area.<sup>635</sup>

We see, therefore, the operation of a series of interprovincial and local ports through which goods will have been shipped and redistributed. Such distributive nodes

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<sup>627</sup> cf Santamaria, C L (1984) "L'épave de la Chrétienne H à Saint-Raphäel (Var)" in *Archaeonautica* 4 p 9-52; Revilla Calvo, V (1993) op. cit. n. 76 p 166.

<sup>628</sup> cf Ribera Lacomba, A and Fernandez Izquierdo, A (1985) op. cit. n. 41 p 88; Martin, G and Saludes, J (1966) op. cit. n. 45 p 166.

<sup>629</sup> cf Fernandez Izquierdo, A (1982) op. cit. n. 108 p 119.

<sup>630</sup> cf Mas, J (1985) "Excavaciones en el yacimiento submarino de San Ferreol (Costa de Cartagena)" in *VI CIAS*, Cartagena 1982 (Cartagena) p 189-223.

<sup>631</sup> cf Fernandez Izquierdo, A (1990) op. cit. n. 604.

<sup>632</sup> cf Fernandez Izquierdo, A (1982) op. cit. n. 108 p 113-114.

<sup>633</sup> cf Nieto Prieto, F J and Nolla i Brufau, J Ma (1985) op. cit. n. 107 p 158.

<sup>634</sup> cf Nieto Prieto, F J (1993) op. cit. n. 614; cf also Fernandez Izquierdo, A (1982) op. cit. n. 108 p 114.

<sup>635</sup> Although these seem to have been dependant upon larger ports elsewhere such as Narbonne, cf Nieto Prieto, F J (1993) op. cit. n. 614.

can be seen both in the production and shipment of commodities and may be taken to imply a centralising agent in the local economy.<sup>636</sup> It would appear that certain regions such as the Baix Llobregat were able to gain a predominant position in the supply of goods to both the *limes* and to Italy. The less urbanised regions of Castellon and Valencia may have concentrated rather upon the satisfaction of local demand with amphorae being found at a number of locations within the hinterland: El Puig<sup>637</sup>, Tossalet de les Mondes<sup>638</sup>, Ventonillo de Carabases (Elche)<sup>639</sup>, L'Alcudia<sup>640</sup>, Villena<sup>641</sup>, Elda<sup>642</sup>, Punta de los Molinos<sup>643</sup>, La Teulera, Jesus Pobre<sup>644</sup>, Denia<sup>645</sup> and Valencia<sup>646</sup>, although the Dr 2-4 amphorae recovered from the wreck of Cala Vellana appear to have originated from Oliva.<sup>647</sup>

One must beware, therefore, of adjudging the province to have been an economic unit. Clearly different regions were better able to capitalise upon the opportunities afforded by the *annona* and the *annona militaris*. Such may in part have been based upon the presence of an established villa economy revolving around the interdependence of urban and rural settlement and with it the existence of developed mechanisms and routes of exchange. Thus E. Tarraconensis found itself supplied by four forms of commerce (**fig. 42**). Firstly, although a number of centres seem to have formed points of supply within the region, much of the coast particularly in Castellon/Valencia will have relied upon redistribution of goods from these centres through coastal barges carrying a diversified cargo as outlined by Fernandez Izquierdo. Secondly, we see the movement of goods along the coast of Cataluña to the Rhone from which it could continue to Italy or head north to Gaul and the Rhine frontier. Such routes are particularly prevalent in the case of Catalan produce but the N-S movement

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<sup>636</sup> cf Revilla Calvo, V (1993) op. cit. n. 76 p 167.

<sup>637</sup> cf Aranegui Gasco, C (1981) op. cit. n. 33 p 531 - from Saguntum: BC MATERNI SACYNTO.

<sup>638</sup> cf Gisbert Santonja, J A (1980) "El yacimiento romano del Tossalet de les Mondes (Pego)" in *Saguntum* 15 p 221-223 - perhaps originating from Oliva.

<sup>639</sup> cf Reynolds, P (1993) op. cit. n. 57 p 60.

<sup>640</sup> cf Reynolds, P (1993) op. cit. n. 57 p 63.

<sup>641</sup> cf Reynolds, P (1993) op. cit. n. 57 p 79-80.

<sup>642</sup> cf Reynolds, P (1993) op. cit. n. 57 p 74-75.

<sup>643</sup> cf Fernandez Izquierdo, A and Gisbert Santonja, J A (1992) op. cit. n. 45 p 82.

<sup>644</sup> cf Gisbert Santonja, J A (1992) op. cit. n. 33 p 92.

<sup>645</sup> cf Gisbert Santonja, J A (1992) op. cit. n. 33 p 96.

<sup>646</sup> cf Fernandez Izquierdo, A (1984) op. cit. n. 45.

<sup>647</sup> cf Parker, A J (1992) op. cit. n. 4 p 92.

also explains the appearance of more isolated examples of Baetican amphorae within the region.<sup>648</sup> Local production seems to have been sufficiently well established to exclude Baetican imports, even though Tarraconensian oil production does not appear to have been on a sufficient scale to capture overseas markets.<sup>649</sup> Their appearance in the region would appear to have been a corollary of the shipment of Baetican oil along the coast to Gaul/Italy in which capacity it is possible that they served a redistributive role taking on and off loading cargo at various points along its route. It is also perhaps significant that Reynolds has suggested that the Dr 20 at Punta de l'Arenal may be of a local origin.<sup>650</sup> Equally we have little evidence of southward exchange. Although there are examples of Gallic amphorae within the region, for example the incidence of Gauloise 4 at El Saler<sup>651</sup>, there seems to have been little systematic trade from the North with the lack of Catalan amphorae in SE Tarraconensis being striking.<sup>652</sup> Local demand seems to have been satisfied by Tarraconensian production excluding the importation of commodities from elsewhere. Thirdly, we see the movement of goods from Cataluña to the Balearic islands via Columbretes, a commerce attested by the incidence of both Pascual 1 and Dr 2-4 amphorae within the islands. Such exchange may also be explained by the fourth route from Tarraconensis to Rome - that which

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<sup>648</sup> Dr 20 amphorae are attested at Sitges, cf Granados, J-O and Rovira, C (1987) "Tres nous centres de produccio d'amfores a l'ager de la Colonia Barcino" in *El Vi a l'Antiguitat: Economia, Produccio i Comerç al Mediterrani Occidental Actes I Colloqui d'Arqueologia Romana* (Museo de Badalona) *Monografies Badalonines* n. 9 p 129; El Saler, cf Ribera Lacomba, A and Fernandez Izquierdo, A (1985) op. cit. n. 41 p 86-87; Pinatar (Cabo de Palos), cf Mas, J (1985) op. cit. n. 109 p 162; Punta de l'Arenal (Javea), cf Martin, G and Serres, Ma D (1970) op. cit. n. 57 p 52, 63, 74, 107; Grau Vell, cf Mantilla Collantes, A (1987) op. cit. n. 44 p 397, cf also Aranegui Gasco, C (1978) op. cit. n. 388 p 313; Riells-La Clota, cf Nieto Prieto, F J and Nolla i Brufau, J Ma (1985) op. cit. n. 107 p 150; Columbretes, cf Fernandez Izquierdo, A (1982) op. cit. n. 108 p 122; Tossalet de les Mondes, cf Gisbert Santonja, J A (1980) op. cit. n. 638 p 233; Rosas, cf Nolla i Brufau, J Ma (1984) "Excavaciones recientes en la Ciudadela de Rosas: el edificio bajo-imperial" in Keay, S J, Jones, R F J and Blagg, T *Papers in Iberian Archaeology* BAR Int. Ser. 193 p 434; Balsa de la finca de Castillo, cf Reynolds, P (1993) op. cit. n. 57 p 469; Santa Pola, cf Sanchez Fernandez, Ma J, Blasco, E and Guardiola, A (1989) op. cit. n. 105 p 422; Denia, cf Fernandez Izquierdo, A and Gisbert Santonja, J A (1992) op. cit. n. 45 p 84; La Androva, cf Fernandez Izquierdo, A and Gisbert Santonja, J A (1992) op. cit. n. 45 p 85; Playa de los Mariños, cf Fernandez Izquierdo, A and Gisbert Santonja, J A (1992) op. cit. n. 45 p 84; La Teulera, cf Gisbert Santonja, J A (1992) op. cit. n. 33 p 96; L'Almadrava, cf Abascal, J M and Gisbert Santonja, J A (1991) op. cit. n. 33 p 135.

<sup>649</sup> cf Fernandez Izquierdo, A (1982) op. cit. n. 108 p 122.

<sup>650</sup> cf Reynolds, P (1993) op. cit. n. 57 p 85.

<sup>651</sup> cf Ribera Lacomba, A and Fernandez Izquierdo, A (1985) op. cit. n. 41 p 85. One must, however, bear in mind the possibilities of local production as was referred to earlier.

<sup>652</sup> cf Fernandez Izquierdo, A (1982) op. cit. n. 108 p 124.

runs from Cabo de la Nao to the Straits of Bonifacio - a route that would go some way to explaining the lack of Baetican vessels in E. Tarraconensis.

Thus we see that Tarraconensis acts as a nodal point for a number of trade routes upon which local produce will have been distributed through the medium of secondary cargoes. Further to this the localised exchange of products, although unquantifiable seems to have functioned as an entity to the exclusion of external imports. Particular points seem to have been important as centres of supply being characterised by distributions of particular commodities, whilst much of the region seems to have received a more variable assemblage of amphorae through redistribution from these points of supply.

This regionalism is perhaps particularly evident in the distribution of *garum* amphorae. Fish sauce containers are widely found across much of the Western Mediterranean with 60% of Spanish wrecks carrying such.<sup>653</sup> The intensity of the trade in fish sauces is best seen by their predominance within the archaeological record at Carthago Nova where 50% of the vessels recovered from the harbour were classified as Dr 7-11.<sup>654</sup> They occur frequently within coastal contexts but the recent identification of Tarraconensian production has meant that archaeologists have almost exclusively classified them as having originated in Baetica, making any understanding of the relative scale of production between the two provinces an impossibility (**fig. 41**). Some deposition clearly represents shipment along the N-S axis of the coast from Baetica to the North: thus the Dr 7-11 amphorae found at El Saler appear to be related to those from Cerro de los Martires<sup>655</sup>, whilst the fabric of those from Tossalet de les Mondes points to a source in the South.<sup>656</sup> However, the readiness of archaeologists to ascribe finds of Dr 7-11 amphorae to a Baetican source would appear to be premature with increasing numbers of amphorae being attributed to a more northerly origin.

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<sup>653</sup> That the Spanish fish sauce trade extended as far as Palestine would appear to be the case from the finds of unspecified amphorae pertaining to such from the harbour at Caesarea Maritima, cf Blakely, J A (1988) "Ceramics and Commerce: Amphorae from Caesarea Maritima" in BASOR 271 p 31-50.

<sup>654</sup> cf Mas, J (1985) op. cit. n. 109.

<sup>655</sup> cf Ribera Lacomba, A and Fernandez Izquierdo, A (1985) op. cit. n. 41 p 88-89, cf also Martin, G and Saludes, J (1966) op. cit. n. 45 p 163, 165.

<sup>656</sup> cf Gisbert Santonja, J A (1980) op. cit. n. 638 p 223-229, though the excavator notes that three fabrics were found.

A Dr 7-11 vessel found at Fos-sur-Mer bears the stamp C. MUSSIDI NEP(os)<sup>657</sup> whilst a similar vessel bears that of TIBISI.<sup>658</sup> That these goods were traded as far as Italy would appear to be shown by the appearance of a Dr 2-4 or Dr 7-11 amphora at Pompeii bearing the same stamp.<sup>659</sup> Hesnard has noted that three of the Dr 9 amphorae from La Longarina have the same fabric as associated Tarraconensian vessels - Pascual 1 and Dr 2-4.<sup>660</sup> Also present are eight Dr 10 vessels reminiscent of those of Palamos and Empúries.<sup>661</sup>

A number of wrecksites have further shown the existence of an exportation of Tarraconensian Dr 7-11. The employment of the route along the southern coast of France would appear to be evidenced by the incidence of a number of wrecks containing Tarraconensian vessels. A desposit of amphorae has been located at Cap Gros C. The bulk of the vessels pertain to Lamboglia 2 although an origin of the cargo in NE Spain seems likely on the basis of finds of individual Pascual 1, Dr 2-4 and Dr 9.<sup>662</sup> It is not clear, however, if the site represents a wreck or an alternative form of deposition.

Included within the cargo of Dr 2-4 amphorae at La Chrétienne H are three Dr 9-10 amphorae and a single example of a Dr 7.<sup>663</sup> The Dr 2-4 amphorae have been shown to have originated from the Baix Llobregat on the basis of the fabric of the vessels, an hypothesis supported by the attested stamps, 16% of which come from the kiln of Can Tintorer.<sup>664</sup> As to the Dr 9-10 amphorae, petrological similarities with the other Tarraconensian products point to a similar origin<sup>665</sup>, although that of the Dr 7 amphora is unclear. The wreck as a whole appears to have dated to the early First Century AD.<sup>666</sup> To those from La Chrétienne H might also be added the looted wreck

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<sup>657</sup> cf Liou, B (1975) "Directions des recherches archéologiques sous-marines" in *Gallia* 33 p 577.

<sup>658</sup> cf Tchernia, A (1971) op. cit. n. 24 p 67.

<sup>659</sup> cf Tchernia, A (1971) op. cit. n. 24 p 65; cf also Tchernia, A (1979) "Il Vino: Produzione e Commercio" in Zevi, F (ed.) *Pompei 79* (Naples) p 92 fig. 41.

<sup>660</sup> cf Hesnard, A (1980) op. cit. n. 87 p 147-148.

<sup>661</sup> Amongst the cargo of Dr 2-4 amphorae from the wreck of Dramont B (Saint-Raphaël, Var) is a Dr 10 amphora recalling those from Palamos, cf Corsi-Sciallano, M and Liou, B (1985) op. cit. n. 91 p 71.

<sup>662</sup> cf Parker, A J (1992) op. cit. n. 4 p 104 n° 190.

<sup>663</sup> cf Santamaria, C L (1984) op. cit. n. 627.

<sup>664</sup> cf Santamaria, C L (1984) op. cit. n. 627 p 32.

<sup>665</sup> cf Santamaria, C L (1984) op. cit. n. 627 p 40.

<sup>666</sup> cf Santamaria, C L (1984) op. cit. n. 627 p 52.

of La Chrétienne I which seems to have carried resin as well as Dr 9-10, Dr 28 and Dr 26 amphorae.<sup>667</sup>

The wreck site of Mateille B (Gruisan) carried Dr 7-11 amphorae which seem to have been produced somewhere in E. Tarraconensis.<sup>668</sup> The mixed cargo from Pointe Debie A may also have been of a similar provenance on the basis of finds of Tarraconensian Dr 2-4 along with Dr 7-11, Gallic amphorae and a single handle of a Dr 20 amphora.<sup>669</sup> Dated to the period AD 50-70 is the wreck of Pointe Lequin C which carried Tarraconensian Dr 2-4, Gallic and Dr 7-11 amphorae.<sup>670</sup> That this trade reached the Italian peninsula can be seen by the wreck of Diano Marino dated to the mid First Century AD.<sup>671</sup> The principal cargo of the wreck seems to have been Dr 2-4 bearing stamps which give their origin as the Baix Llobregat, specifically the kiln of Can Tintorer. Also amongst the cargo were fourteen *dolia* bearing a number of stamps pertaining to the PIRANI and two Dr 7-11 amphorae, one of which bears the graffito ANTHE.

As well as the northerly route from Cataluña to Italy, fish sauce amphorae also appear to have followed the more southerly route from Cabo de la Nao/Columbretes to the Balearics and thence to the Straits of Bonifacio from where they reached Ostia/Rome and Campania. As one would expect, evidence of commerce is plentiful from the waters of Mallorca, Ibiza, Corsica and Sardinia and it would be reasonable to view this as the principal route between SE Spain and Italy. Finds of fish sauce amphorae are well attested and a wreck containing Dr 9 amphorae has been found at Sant Antoni (Ibiza) and has been dated to the early First Century AD.<sup>672</sup> A cargo of Dr 2-4 and Dr 7-11 amphorae have been found at Marritza along with Terra Sigillata Clara A although there is no evidence as to the provenance of the vessel.<sup>673</sup> A Tarraconensian origin for the Sud-Lavezzi C wreck seems assured with finds of Tarraconensian Dr 2-4,

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<sup>667</sup> cf Parker, A J (1992) op. cit. n. 4 p 143-144 n. 308.

<sup>668</sup> cf Parker, A J (1992) op. cit. n. 4 p 271 n. 683; Solier, Y (1981) p 224-227.

<sup>669</sup> cf Parker, A J (1992) op. cit. n. 4 p 322 n. 841.

<sup>670</sup> cf Parker, A J (1992) op. cit. n. 4 p 324 n. 848.

<sup>671</sup> cf Corsi-Sciallano, M and Liou, B (1985) op. cit. n. 91 p 95-107.

<sup>672</sup> cf Parker, A J (1992) op. cit. n. 4 p 383 n. 1029. On amphora finds in general, cf Pilar Serrano, M (1963) "Anforas Romanas en las Costas de Mallorca" in *AEA* 36 p 207-210.

<sup>673</sup> cf Parker, A J (1992) op. cit. n. 4 p 262 n. 659.

Pascual 1 and Dr 14 fish sauce amphorae<sup>674</sup> and is dated to AD 15-25. The origin of Sud-Perduto B is less certain with a cargo composed of amphorae and lead ingots. The ceramics found consisted largely of Dr 7 and Dr 9, many of which contained remains of mackerel, although some of the Dr 9 seem to have contained wine. The rest of the cargo consisted of Dr 28, Dr 12, Dr 10 and Oberaden 83 vessels which suggest an origin in Southern Spain.<sup>675</sup> The route seems to have been particularly prevalent for the trading of fish sauces from Southern Spain<sup>676</sup> and Carthago Nova<sup>677</sup>, however, many such vessels appear to have served a role as agents of redistribution rather than merely supply taking on and off loading cargoes along the vessel's route. Such is well evidenced by the Capo Graziano C wreck dated to the period AD 1-10, the principal cargo of which consists of Dr 20 amphorae, although late Republican, Dr 7, Dr 2-4 vessels and a horn-handled form are also found.<sup>678</sup> A similar cargo is found in the wreck of Tiboulen de Maïre containing not only Dr 20 but also Dr 28, Dr 14, Beltrán IIa and IIb amphorae from Baetica, Dr 2-4 vessels from Tarraconensis and Gauloise 4 amphorae from Gaul. The vessel must have thus put into at least a harbour on the southern coast of Gaul, if not into a Tarraconensian port as well.<sup>679</sup> That of Ponte d'Oro contains Dr 2-4, Haltern 70, Dr 7-11, Camulodunum 186 and Dr 20 vessels.<sup>680</sup>

Such examples must suffice to show what appears to have been a widespread occurrence, namely the diversification of cargoes - recalling those of the fictional Trimalchio. Despite the obvious scale of production, particularly of wine within the region, the transport of commodities appears to have remained more limited in scope. What is striking about the distribution of Tarraconensian fish sauce vessels is their association with wine amphorae, particularly Dr 2-4 of the same origin, as for example,

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<sup>674</sup> cf Corsi-Sciallano, M and Liou, B (1985) op. cit. n. 91 p 130-144.

<sup>675</sup> cf Parker, A J (1992) op. cit. n. 4 p 416 n. 1121.

<sup>676</sup> cf for example, Lavezzi B: Parker, A J (1992) op. cit. n. 4 p 239 n. 585.

<sup>677</sup> The Cabrera 5 wreck may have originated at Carthago Nova, cf Colls, D, Domergue, C and Guerrero Ayuso, V (1986) "Les lingots de plomb de l'Epave Romaine Cabrera 5 (Ile de Cabrera, Baléares)" in *Archaeonautica* 6 p 31-80. Six amphorae were recovered from the site: five Dr 7 and one Dr 10 (recalling those of Titan, Grand Congloué 3, Planier 5, Cabrera 4 and Palamos), the bulk of the cargo, however, was composed of lead ingots which may have originated in the Sierra Morena on chronological grounds - although the exact provenance and thus the relationship of the cargo to either Baetica or Carthago Nova must remain unclear.

<sup>678</sup> cf Parker, A J (1992) op. cit. n. 4 p 118 n. 235.

<sup>679</sup> cf Parker, A J (1992) op. cit. n. 4 p 424 n. 1148.

<sup>680</sup> cf Parker, A J (1992) op. cit. n. 4 p 327 n. 863.

we see at Pointe Lequin C, Diano Marino and Ostia. Such should not come as a surprise when considering what we have said earlier as to the existence of *negotiatores* and *societates* engaged in the trading of a range of commodities including both wine and fish sauce. Men such as the *Negotians Salsamentarius et Viniarius*, Tib. Claudius Docimus clearly proclaimed their involvement in such commerce, whilst such *societates* as those of the Baebii, AA Atinii and QQ Caecilii seem to have had similarly diversified interests. The development of the trade of Tarraconensian Dr 2-4 during the first Century AD will have provided fish sauces with access to markets that were otherwise unobtainable. *Navicularii* will have carried fish sauce amphorae as a secondary cargo to that of wine, enabling the incidence of Tarraconensian fish sauces across the Western Mediterranean and Italy. Certainly it would appear that some Tarraconensian fish sauces, such as *Garum Sociorum* were sufficiently prized to attract a market in its own right - as would be evidenced by the incidence of Dr 7-11 in the harbour at Carthago Nova. However, the opportunity afforded by the expansion of Tarraconensian trade in this period would appear to have been exploited by the fish sauce merchants.

The trading of Tarraconensian wine, as attested by the finds of Dr 2-4 amphorae appears, however, to have entered a decline by the close of the First Century AD - perhaps as a consequence of Domitian's legislation on vine cultivation in the Italian peninsula. Unfortunately the reasons for the gradual disappearance of Dr 2-4 amphora from the archaeological record are unclear and a variety of reasons have been put forward: that they were replaced by another amphora form; that the use of amphorae gave way to that of other forms of containers such as wine skins or barrels; or that the production of wine, and thus its trade ceases.

Such an hypothesis seems also to be applied to both Dr 7-11 and to other fish sauce amphora forms which are dated almost exclusively to the First Century AD.<sup>681</sup> Such a decline is not, however, matched either by the evidence of amphora kilns or by the occupation of fisheries. Thus, for example, the kiln at Llafranc remained in use at least until the second half of the Third Century<sup>682</sup> whilst fisheries such as Santa Pola and Rosas may have remained in use as late as the Seventh Century AD. Although

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<sup>681</sup> Dr 33 production may have continued to the Fourth Century AD, cf Barbarus Probianus.

<sup>682</sup> cf Miró i Canals, J (1988) op. cit. n. 22 p 49-50.

some continuity of amphora production is possible with Almagro 53 vessels being an evolved form of Dr 21-22, there would have seemed to have been a cessation in the trading of salt fish by the early Second Century AD. Any identification of later production is difficult to discern as no subsequent kilns have been excavated pertaining to late Imperial amphora production.<sup>683</sup> When further production does appear the economic focus seems to have shifted away from the villa economies to the North to a series of kilns producing amphora forms specifically related to the fish factories of SE Tarraconensis, a topic which must, however, be left until the coming chapter.

Competition from African exports with the increased incidence of N. African amphora forms may well explain the decline in Tarraconensian exports and without its 'primary cargo', locally produced fish sauce was unable to supply foreign markets. Production of such, however, although seeming to enter a period of change, seems to have continued and appears to have shifted towards local production with the appearance of non-amphora ceramic vessels for local exchange and the exclusion of Africana amphora forms reflects this. Such a role may go some way to explain the lack of Tarraconensian fish sauce amphorae from locations in the interior. Clearly internal routes: both roads like the *Via Augusta*, and the Rio Ebro - enabling the development of important entrepôts such as Caesaraugusta and Celsa, were important in the exchange systems of the region, however, the dependence of Tarraconensian inter-provincial trade upon official supply may explain the concentration upon the two routes between Spain and Italy as the principal routes of supply. *Villae* were established in relation to routes of communication into order to access the essentially urban based redistributive mechanisms bringing in and exporting produce to and from points of supply from which they would be shipped out to more localised points of redistribution either along the coast or by means of inland roads and rivers. It is the breakdown of the former which caused Tarraconensian production to turn to more localised distribution from the Second Century AD. The exchange of fish sauce was a parasitic, not causative factor in the province's economy being forced into eclipse as the principal commercial routes shifted to the African provinces, only to reappear, albeit in a very different form,

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<sup>683</sup> cf Keay, S J (1984) op. cit. n. 11 p 401.

when the wider economic structure of the Empire, and thus the interrelationship between points of supply and redistribution had begun to break down.

## CONTINUITY AND CHANGE IN THE LATE EMPIRE

### 1. 'THE THIRD CENTURY CRISIS'

Conventionally the Third Century AD is seen as a period of violent economic collapse with the destruction of urban centres and the gradual shift away from towns as economic centres in favour of semi-independent rural *villae* free from the exactions of the Imperial government and leading to the economic fragmentation of the Western Empire. Central to this hypothesis is the interpretation of a series of invasions that ravaged, particularly the eastern coastline of the Iberian Peninsula during the later Third Century. Although Probus is accredited with measures to restore the economy of the provinces thus devastated, trade seems never to have recovered, the markets now being swamped by North African exports. Included within this bleak picture were the fisheries of the South and East Coasts which seem never to have recovered their prior importance. More recently, archaeologists have increasingly underplayed the importance of the barbarian invasions in favour of a process of more gradual social and economic change, the expansion of the empire causing the centres of production to move to the peripheral provinces whilst economic contraction appears within the provinces of the core of the empire.<sup>1</sup>

Although the essential details remain agreed upon, the relative emphasis to be put upon either the invasions or economic change is widely disputed with the traditional interpretation of the devastating effects of the barbarian invasions remaining a pervasive one.<sup>2</sup> It seems clear, however, that the period from the mid Second Century AD to the late Third Century AD was one of considerable social and political instability the import of which to the breakdown to the relationship between town and country that formed,

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<sup>1</sup> cf Reece, R (1981) 'The Third Century: crisis or change?' in King, A and Henig, M (eds) The Roman West in the Third Century: contributions from Archaeology and History BAR Int. Ser. 109 (Oxford) p 34.

<sup>2</sup> cf Keay, S J (1988) Roman Spain (London).

as we have seen, the underlying economic structure of the Early Empire, may well have been great. Although there appears to have been a restoration of political and to a lesser extent, economic stability from the Tetrarchic period onwards, the economic structure of the region seems to have been very different from that which went before. A number of fisheries seem only to have continued at a residual level whilst from the Fourth Century AD we see the establishment of concentrated salt fish installations more reminiscent of the Baetican installations of the first two Centuries AD than their Tarraconensian precursors. Such factories seem to have thrived with a restoration of economic vibrancy, at least on a purely local level within the region during the Late Imperial and Visigothic periods, although the evidence for these sites is too limited to enable the establishment of conclusive theories as to the conclusion of fish salting within Tarraconensis, although that of Baetica continues into the Medieval period. We shall, therefore, first consider the effects of the invasions of the Third Century AD before turning our attention to the renaissance of fish salting production during the Late Imperial and Visigothic periods.

A number of literary sources refer to an invasion of the Franks during the reign of Gallienus which destroyed Tarraco before continuing to Africa.<sup>3</sup> The sources agree that Tarraco was sacked by the invaders and that, if Orosius is to be believed, the ruins were still visible in the Fifth Century AD. Aurelius Victor also refers to the invaders having been Franks who wrought a path of destruction across both Gaul and Spain before crossing by boat to Africa. None of the sources, however, describe the scale and

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<sup>3</sup> cf Aurelius Victor 33.3: *Gallienus rem Romanam quasi naufragio dedit... adeo uti... Francorum gentes, direpta Gallia, Hispaniam possiderent, vastato aca paene direpto Tarraconensium oppido, nactisque in tempore navigiis, pars in usque Africam permearet*; Eutropius 8.8.2: *(sub Gallieno) Germani usque ad Hispanias penetraverunt et civitatem nobilem Tarraconem expugnaverunt*; Orosius 7.22.7-8: *Germani ulteriores abrasa potiuntur Hispania... exstant adhunc per diversas provincias in magnarum urbium ruinis parvae et pauperes sedes, signa miseriarum et nominum indicia servantes, ex quibus nos quoque in Hispania Tarraconem nostram ad consolationem miseriae recentis ostendimus*; 7.41.2: *inruptae sunt Hispaniae, caedes vasatationesque passae sunt: nihil quidum novum, hoc enim nunc per biennium illud, quod hostilis gladius saevis sustinere a barbaris, quod per ducentos quondam annos passae fuerant a Romanis, quod etiam sub Gallieno imperatore per annos propemodum duodecim Germanis exceperunt*; Hyeron. *Chron.* 1830: *Germanis Hispanias obtinentibus Tarraco expugnata est*; Prosper of Tyre *Epit. Chron.* 441, 879: *Germanis Hispanias optinentibus Tarracona expugnata est*. cf also Arce, J (1988) *España entre el mundo Antiguo y el mundo Medieval* (Madrid) p 59; Blázquez Martínez, J M (1968) 'La Crisis del Siglo III en Hispania y Mauretania Tingitania' in *Hispania* 28 p 5; Padilla Monge, A (1989) *La Provincia Romana de la Betica (253-422)* (Seville).

effect of this incursion at anywhere other than Tarraco, nor do they give a date for the disturbance. However it has long been a point of agreement that large parts of the south and east of the Peninsula were devastated and that there is considerable archaeological evidence to support this.

The reduction in the population of the Neapolis at Empuries and the reuse of much of the settled area as a necropolis has been dated to the second half of the Third Century AD, whilst part at least of Baetulo was destroyed or abandoned at some point post AD 263.<sup>4</sup> Barcelona and Gerunda seem also to have been destroyed during this period.<sup>5</sup> A number of villa sites within the North-East also point to destruction at this time, at Can Sans, Tossa del Mar, Sabadell, Adarró, San Cugat del Vallés, Els Munts (Altafulla), Porporas (Reus), Calafoll and Vilauba amongst others.<sup>6</sup> The scale of the destruction caused may be indicated by Paulinus' description of the ruins of Ilerda, Bilbilis and Calagurris,<sup>7</sup> whilst the decline of the socio-political structure of these towns may be indicated by the inclusion of monumental remains within the walls of Caesaraugusta, Iruña, Conimbriga and Palencia<sup>8</sup> - a feature also seen within the communities of Northern Gaul and which is commonly associated with the restorations of Probus.<sup>9</sup>

From the evidence of destruction the invaders appear to have followed the route of the *via Heraclea* from Tarraco to the south. Destruction levels have been evidenced from a number of sites through Alicante and Valencia, those at Elche being associated

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<sup>4</sup> cf Blázquez Martínez, J M (1968) op. cit. n. 3 p 6-7; Nieto Prieto, F J (1981) "Acerca del progresivo despoblamiento de Empuries" in *RSL* 47.1-4, Omaggio a Nino Lamboglia 5 p 35-51.

<sup>5</sup> cf Balil, A (1964) *Colonia Iulia Augusta Paterna Faventia Barcino* (Madrid); García i Bellido, A (1965) "Retratos romanos hallados en las murallas de Barcelona" in *AEA* 37 p 55; cf also Blázquez Martínez, J M (1968) op. cit. n. 3 p 7.

<sup>6</sup> cf Blázquez Martínez, J M (1968) op. cit. n. 3 p 8-9, also included in Blázquez's list is the villa at Torre Llauder (Mataró) which the excavator believed was destroyed in the early Fifth Century AD, the rejection of which Blázquez does not support, cf Ribas i Beltrán, M (1963) *La Villa Romana de Torre Llauder de Mataró* EAE 47 (Madrid) p 5. cf also Castañer i Masoliver, P, Tremoleda i Trilla, J and Roure i Bonaventura, A (1990) "Un conjunt ceràmic de finals del segle III d.C. a Vilauba (Camós, Pla de l'Estany)" in *Cypsela* 8 p 157-191.

<sup>7</sup> *Epistulae* 29.57-59: *Birbilis aut haerens scopulis Calagorris habebit aut quae deiectis iuga per scruposa ruinis arida torrentem Sicorim despectat Hilerda?* cf also 223-225: "Nam quod in eversis habitacula ponis Hibera urbibus et deserta trio legis oppida versu montanamque mihi Calagorrim et Birbilim acutis pendentem scopulis collemque iacentis Hilerdae exprobras. *Parentalia* 2.3.4 on Ilerda: *parvula quem latebris fouit Hilerda suis.*

<sup>8</sup> cf Blázquez Martínez, J M (1968) op. cit. n. 3 p 10.

<sup>9</sup> cf also Richmond, I A (1931) "The Town Walls in Hispania Citerior" in *JRS* 21 p 86-100.

with coinage of Philip I, Philip II and Trebonianus Gallus with Ramos Folqués pointing to the town having been destroyed as a consequence of military action with finds of weapons and catapults from the site.<sup>10</sup> Such destruction may also explain the contraction of sites such as Dianium and Cullera. Tossal de Manises seems to have been destroyed c230 AD<sup>11</sup>, although some form of occupation appears to have continued in the vicinity of Monte Tossal de Manises<sup>12</sup> with houses being located in the vicinity of the walls of Torres del Toro and de la Termas, and burials have been found within the town dated to the Fourth Century AD. *Villae* such as Torre de la Cruz, la Quintilla (Lorca), Huerto de Paturro, Las Torrejones may also date to this period whilst the extent of the unrest may be indicated by the shift of settlements such as Las Maridiez, Salto de la Novia and Begastri to more defensible sites.<sup>13</sup> As well as levels of destruction within several centres of the region, Blázquez has noted that Valencia appears to have entered a period of decline on the basis of finds from the Bortella necropolis<sup>14</sup> - an hypothesis that is supported by finds from Les Foies (Manuel).<sup>15</sup>

A further indication of the devastation caused by the incursions of the 260s AD is afforded by the deposition of coin-hoards which have long been used as such for Gallic sites. A number of such hoards have been located along the East Coast: at Rosas, Altafulla, Tarragona, Castellon de la Plana, Jimena de la Frontera, as well as further inland at Jaén and Valverde del Camino.<sup>16</sup> The dating of these hoards lies in the reign of Gallienus and has been concentrated in the period 258-262 AD,<sup>17</sup> with Balil dating the invasion to c 262 AD.<sup>18</sup> A number of hoards are, however, dated to the reign of

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<sup>10</sup> cf Ramos Folqués, R (1963) "Unos pozos manantiales de época romana en La Alcudia de Elche" in *AEA* 36 p 234; cf also Blázquez Martínez, J M (1968) op. cit. n. 3 p 11.

<sup>11</sup> cf Rosser Liminaña, P (1994) "Nuevas aportaciones a la problemática de la Antigüedad Tardía en Alicante" in *LQNT* 2 p 70-71.

<sup>12</sup> cf Rosser Liminaña, P (1994) op. cit. n. 11 p 81.

<sup>13</sup> cf Ramallo Asensio, S F (1989) *La Ciudad Romana de Cartago Nova: la documentación arqueológica* (Murcia) p 151; cf Blázquez Martínez, J M (1968) op. cit. n. 3 p 10-11.

<sup>14</sup> cf Blázquez Martínez, J M (1968) op. cit. n. 3 p 10.

<sup>15</sup> cf Sentandreu Gimeno, M C (1966) "La Necrópolis romana de 'Les Foies' (Manuel, Valencia)" in *APL* 11 p 197.

<sup>16</sup> cf Sagredo, L (1985) "Las invasiones del siglo III d.C. en Hispania a la luz de los tesorillos monetales" in *HA* 11-12 p 91-93; Blázquez Martínez, J M (1968) op. cit. n. 3 p 19-21.

<sup>17</sup> cf Sagredo, L (1985) op. cit. n. 16 p 94

<sup>18</sup> cf Balil, A (1959) "Hispania en los años 260 a 300 d.C." in *Emerita* 27 p 270-271.

Probus<sup>19</sup> and it has been suggested that these represent a second invasion of the Peninsula dated to c278 AD that is otherwise unattested in the literary sources.<sup>20</sup> Caution must, however, be exercised in considering the existence of coin hoards as being an indication of economic and other social disturbances which may better fit the now more popular interpretation of gradual economic change.

One should not, however, ignore the economic consequences of the disruption caused: the destruction of *villae* and towns must have resulted in a decline of net capital available within the region and one can point to a decline in industrial investment at this time. What is particularly apparent is the contraction of amphora production from the first two Centuries AD, thus for example, we see the cessation of Dr 30 production at L'Almadrava during the period 275-285 AD although some form of residential settlement seems to have continued.<sup>21</sup> Fish sauce production may have also been adversely affected with the destruction of a number of fisheries: at Cerro del Trigo, Villavieja, Carteia, Belo, Lixus, Cotta, Kuass, Tahadart, Sahara and Alcazarseghuer.<sup>22</sup> The fish factory at Punta de l'Arenal appears to have been destroyed during the second half of the Third Century AD,<sup>23</sup> although occupation on the site appears to have continued until the late Fourth-early Fifth Centuries AD if not beyond.<sup>24</sup> Unfortunately, we have no indication of the continuation, or otherwise of industrial activities on the site at this date, although the continuity of settlement appears

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<sup>19</sup> cf Balil, A (1959) op. cit. n. 18 p 281-282: Reus, Liédena, Clunia, Fragas do Piago, Santo Thyrso, Almodóvar, Peal de Becerro, Linares, Santa Elena, Seville - although those of Linares and Seville include pre-reform coinage of Diocletian and that of Clunia, issues of Numerian and Carinus, cf also Sagredo, L (1985) op. cit. n. 16 p 102-103: Liedena, Sangüenza, Clunia, Valsadorrin, Honcalada, Cauca and Petavonium. cf also Arce, J (1988) op. cit. n. 3 p 65.

<sup>20</sup> cf Blázquez Martínez, J M (1968) op. cit. n. 3 p 22-23.

<sup>21</sup> cf Abascal, J M and Gisbert Santonja, J M (1991) "Numismática y evidencia arqueológica en el alfar Romano de la Almadrava (Setla-Mirarosa-Miraflor)" in *Lucentum* 10-11 p 136-137.

<sup>22</sup> cf Blázquez Martínez, J M (1968) op. cit. n. 3 p 14, 18-19.

<sup>23</sup> cf Martin, G and Serres, Ma D (1970) *La Factoria Pesquera de la Punta de l'Arenal y otros restos romanos de Javea (Alicante)* in *TV del SIP* 38 (Valencia) p 88.

<sup>24</sup> cf Arroyo Ilera, R and Bolufer i Marques, J (1988) "Anàlisi Numismàtica del conjunt monetari de la Punta de l'Arenal" in *Xàbiya* 4 p 26-37; Bolufer i Marques, J (1988) "Ceràmiques fines tardanes de la Punta de l'Arenal" in *Xàbiya* 4 p 40-53. The presence of Terra Sigillata Clara D, Terra Sigillata Clara 'Lucente', Paleochristian Grey Wares and Late Roman C pottery provides a chronology extending as late as the Seventh Century AD, whilst coinage continues until c530 AD.

to have been a feature of coastal communities such as Cullera, Isla de Tabarca, Portitchol, Calpe and elsewhere.<sup>25</sup>

Blázquez has argued that the economic repercussions brought about the decline of Baetican oil production and mining activities at Carthago Nova and elsewhere in comparison to the rise of African exports.<sup>26</sup> Probus' lifting of Domitian's restrictions on vine growing<sup>27</sup> may have served to encourage the revival of provincial production in the aftermath of 262 AD, although one has to ask to what extent Domitian's legislation will have still been effective two hundred years later? Rather it appears that, whilst the invasion of 262 AD did have grave consequences upon the distribution of wealth within the province it is merely a component in a longer history of unrest and resulting dislocation spanning the mid Second Century AD to the beginning of the Fourth Century.<sup>28</sup>

What is perhaps most striking is the apparent selectivity of the destruction with the survival of *villae* alongside those that were apparently destroyed, several of such, as that of Bell-Loch seem to have been at their most prosperous during this period. Whilst a decline in the importance of towns seems to have occurred, we see the growth of wealthy *villae* such as those at Pared Delgada, Vilarrenc and Torre Llauder.<sup>29</sup> The continuity of much settlement through this period is attested by the appearance of Terra Sigillata Clara C from c200/225 AD and Terra Sigillata Clara D from 280/290 AD<sup>30</sup> and we have already referred to the survival of settlement at several of the fisheries after the supposed termination of activity on the site.<sup>31</sup> What seems to have occurred was not that many of the sites were destroyed as a consequence of the invasion of 262

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<sup>25</sup> cf Mateu i Llopis, F (1973) 'Bronces romanos imperiales y vándalos en l'Illa de Cullera' in *APL* 13 p 241-256.

<sup>26</sup> cf Blázquez Martínez, J M (1968) op. cit. n. 3 p 26. On mining in the Late Roman Empire, cf Edmondson, J C (1989) 'Mining in the Later Roman Empire and beyond: continuity or disruption?' in *JRS* 79 p 84-102.

<sup>27</sup> SHA *Vita Probi* 18.8.

<sup>28</sup> It is worth noting that a precise dating of many of the sites traditionally associated with 262 AD is impossible, cf Arce, J (1988) op. cit. n. 3 p 61. Thus, for example, it is impossible to date the levels of abandonment at Empuries beyond the second half of the Third Century AD, with the Neapolis having been given over to a necropolis during the Fourth Century AD.

<sup>29</sup> cf Keay, S J (1984) 'Decline or continuity? The coastal economy of the Conventus Tarraconensis from the Fourth Century to the Late Sixth Century' in Blagg, T, Jones, R and Keay, S J (eds) *Papers in Iberian Archaeology* BAR Int. Ser. 193 (Oxford) p 553.

<sup>30</sup> cf Rosser Liminaña, P (1994) op. cit. n. 11 p 80.

<sup>31</sup> cf chapter 3.

AD, but that there was a growing economic recession and a relocation of wealth away from the economic centres of the region into the hands of self-sufficient rural estates. Although we shall look at the gradual movement of wealth in the coming section, it is perhaps worth considering at this point that 262 AD was merely part of a longer period of unrest within the Peninsula which will have served to constrict the available economic resources and bringing about the collapse of the external markets of the goods of the region.<sup>32</sup>

Speaking during the Second Century AD, Aelius Aristides could proclaim Spain as being at its most prosperous and splendid,<sup>33</sup> a view that is echoed by the author of the *Vita Pii*.<sup>34</sup> By the reign of Antoninus Pius, however, we begin to see signs of unrest within the Peninsula, the continuity of which will have impeded economic recovery.<sup>35</sup> A fragment of the *Fasti Ostienses* records events of the year 145 AD including the marriage of M. Aurelius and Faustina, a *congiarium* given by Antoninus Pius, the celebration of the *ludi taurei quinquennales in circo flaminio* refers to the judgment before the senate of Cornelius Priscianus: *De Cornelio Prisciano in sen[atu iudicium] / [cor]am factum quod provinciam Hispaniam hostiliter / [inqu]ietaverit.*<sup>36</sup> According to the SHA, Cornelius Priscianus committed suicide following an abortive revolt.<sup>37</sup> Unfortunately little further is known either of Priscianus' background or the causes of his revolt: he may have been of an Hispanic origin<sup>38</sup> and to have been the governor of Tarraconensis, although the province in possessing only Legio VII Gemina will have been ill-suited as a base for revolt.<sup>39</sup>

Better attested are the incursions of the Mauri in AD 170/171 and 177/178 which devastated the province of Baetica.<sup>40</sup> The first of these incursions appears to

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<sup>32</sup> cf Balil, A (1959) op. cit. n. 18.

<sup>33</sup> cf *Enc. Rom.* 11.

<sup>34</sup> SHA *Vita Pii* 7.2: *Provinciae sub eo floruerunt.*

<sup>35</sup> For this period, cf Arce, J (1988) op. cit. n. 3, Blázquez Martínez, J M (1976) "Hispania desde el año 138 al 235 d.C." in *Hispania* 36 p 5-87.

<sup>36</sup> cf Arce, J (1988) op. cit. n. 3 p 35.

<sup>37</sup> SHA *Vita Pii* 7.2: *perit et Priscianus reus adfectatae tyrannidis, sed morte voluntaria.*

<sup>38</sup> perhaps being related to the Cutii and Messii, cf Arce, J (1988) op. cit. n. 3 p 37.

<sup>39</sup> cf Birley, A (1987) *Marcus Aurelius: a biography* (London) p 91-92. The revolt may be related to that of the otherwise unknown Acilius Titianus and may have arisen as a consequence of the deployment of troops in Mauretania at this time.

<sup>40</sup> cf Arce, J (1988) op. cit. n. 3 p 38-46; SHA *Vita Marci* 21.1: *Cum Mauri Hispanias prope omnes vastarent, res per legatos bene gestae sunt; Vita Severi* 2.4: *quod Mauri Baeticam populabantur.*

have taken place in the year 171 AD being suppressed by the appointment of the legate Aufidius Victorinus shortly thereafter. The causes of the invasion remain unclear although the relative wealth and lack of defenses for the region may have proved attractive. The effects are difficult to discern, although towns such as Munigua appear to have been attacked. An inscription from Vipasca records the procurator Beryllus as being engaged in the restoration of the mines, perhaps in 173 AD.<sup>41</sup> A further incursion would appear to have taken place in c178 AD on the basis of inscriptions from Singilia Barba and Italica recording the restoration of peace by the procurator C. Vallius Maximianus. Perhaps related to this is a reference in the *Vita Marci* to unrest in Lusitania.<sup>42</sup>

In 186 AD Herodian<sup>43</sup> records the revolt in Gaul of a deserter, Maternus who is said to have ravaged Gaul and Spain.<sup>44</sup> It is impossible to gauge the extent of the Peninsula that was affected by the revolt, but the presence of a vexillation of Legio VII Gemina at Empuries may be related to this,<sup>45</sup> although the centre of the unrest seems to have been Gaul.<sup>46</sup> It has been suggested that the military exactions of this period may have had a causative effect.<sup>47</sup> A decade later the region was included in the realm of the usurper Clodius Albinus<sup>48</sup> and to have continued the conflict after the battle of Lugdunum in 197 AD with Tiberius Claudius Candidus being recorded as campaigning in the Peninsula during 198-199 AD against the governor L. Nonius Rufus.<sup>49</sup> Although archaeological evidence pertaining to the extent of this unrest is difficult to discern, a number of estates appear to have been confiscated by the Severans which may have served as a further drain on the economic resources of the region. It has been suggested

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<sup>41</sup> cf Richardson, J S (1996) *The Romans in Spain* (Oxford) p 232.

<sup>42</sup> SHA *Vita Marci* 22.11: *compositae res et in Hispana, quae per Lusitaniam turbatae erant*; cf also Arce, J (1988) op. cit. n. 3 p 46.

<sup>43</sup> 1.10.1-9.

<sup>44</sup> cf Arce, J (1988) op. cit. n. 3 p 47-50.

<sup>45</sup> cf Blázquez Martínez, J M (1976) op. cit. n. 35 p 69.

<sup>46</sup> cf Thompson, E A (1974) 'Peasant Revolts in Late Roman Gaul and Spain' in Finley, M I (ed) *Studies in Ancient Society* (London) p 304-320.

<sup>47</sup> cf Blázquez Martínez, J M (1976) op. cit. n. 35 p 69.

<sup>48</sup> cf Arce, J (1988) op. cit. n. 3 p 50-52.

<sup>49</sup> cf Alföldy, G (1975) *Die Römischen Inschriften von Tarraco* Madrider Forschungen 10 (Berlin) n. 130; Fitz, J (1966) 'Réflexions sur la carrière de Tib. Claudius Candidus' in *Latomus* 25 p 831-846. cf also Blázquez Martínez, J M (1976) op. cit. n. 35 p 72-73.

that mismanagement of these estates may have played a part in the decline of oil production in the Peninsula.

Unrest seems to have continued within the province in the aftermath of 262 AD also with the Vita Probi referring to the revolt of Proculus and Bonosus, although the account is vague and contradictory.<sup>50</sup> Spain may also have been affected by the piratical raids which ravaged several Mediterranean provinces at this time although I have been unable to find any evidence in support of this.<sup>51</sup> Maximianus appears to have campaigned within the peninsula, perhaps against the Bagaudae,<sup>52</sup> whilst Nazarianus' Panegyric to the Emperor Constantius refers to further unrest.<sup>53</sup> Although the scale of these revolts cannot be defined with any surety, their scale and duration must have greatly hampered the ability of the region to recover and to have exacerbated the economic changes that beset the region from the late Second Century AD.

## 2. 'THE THIRD CENTURY CHANGE'

During the First Centuries BC-AD, as we have seen, the region was marked by the establishment of rural *villae* engaged in the production of resources, some of which will have been exchanged with the towns and *villae* of the vicinity, whilst further quantities will have been exchanged beyond the towns themselves, either as a consequence of provincial taxation<sup>54</sup> or as an ancillary of such. Central to this construct is the relationship between town and country. Towns provided not only the market, but also the wealth, man-power and any raw materials which the rural production centres lacked.<sup>55</sup> This estate economy - within which the fisheries of the East coast were included - seems to have begun to breakdown during the Second Century AD, with the disappearance of locally based amphora forms at this time<sup>56</sup> attesting to a decline in

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<sup>50</sup> SHA Vita Probi 18.5: *deinde cum Proculus et Bonosus apud Agrippinam in Gallia imperium arripuissent, omnesque sibi iam Britannias, Hispanias et Bracatae Galliae provincias vindicarent barbaris semel iuvantibus vicit.* cf also Balil, A (1959) op. cit. n. 18 p 282-283.

<sup>51</sup> cf Balil, A (1959) op. cit. n. 18 p 285-286.

<sup>52</sup> cf Balil, A (1959) op. cit. n. 18 p 287-288.

<sup>53</sup> Nazarianus Paneg. Constant. Aug. 17.1: *Franci ipsi praeter ceteros truces quorum vis cum ad bellum efferveret ultra ipsum oceanum aesta furoris evecta, Hispaniarum etiam oras armis infestae habebant.*

<sup>54</sup> cf Hopkins, K (1980) "Taxes and Trade in the Roman Empire" in JRS 70 p 101-125.

<sup>55</sup> for more detail, cf chapter 4.

<sup>56</sup> Dr 2-4, Dr 28 and Dr 39 all disappear by the end of the Second Century AD, although some forms appear to have survived on a limited scale, cf Dr 21-22, Dr 30/Pelichet 47.

long distance trade from the region - the most pronounced example of which is Baetican oil production which shows a dramatic fall in exports during the period 160-200 AD. Keay<sup>57</sup> has suggested that this was caused by the collapse of towns such as Tarraco as market centres with the increasingly developed rural estates producing more for their own requirements and those of the immediate vicinity, than for urban consumption and the wider inter-provincial economy. Although by the Fourth Century AD towns were still important as administrative, political and increasingly ecclesiastical centres they appear to have lost their role as economic nuclei - a process described by Rosser Liminaña as the 'ruralization' of towns.<sup>58</sup>

To some extent the decay of provincial towns was an inevitable consequence of the provincialization of Rome. From the reign of Augustus we see a gradual movement of wealth away from Tarraconensis to Rome through the hand of men such as Lentulus Augur, a process that was particularly prevalent with the growth of a powerful Spanish faction in the Senate during the reigns of Nerva and Trajan. One should note the involvement of a number of Senatorial *gens* such as the Baebii in the production of amphorae from the region, whilst senators such as Lentulus Augur, P. Rubrius Barbarus, C. Domitius Calvinus, C. Antistius Vetus, the Mucii Scaevolae, M. Iunius Silanus, C. Appius Iunius Silanus, M. Porcius Cato, C. Porcius Cato and the otherwise unknown C.C.V.LM.F.S from L'Almadraba amongst others may well have acquired estates within the province. As well as Italian senators investing in Tarraconensis, we also see a gradual movement by families such as the Baebii, the Fabii Cilonis and the Minicii to Rome. Such men were required to invest a third of their wealth in Italian land<sup>59</sup> the net result of which must have been a gradual drain of wealth away from the Peninsula towards Italy.<sup>60</sup> Not only was adlection to the Senate attractive in itself but it

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<sup>57</sup> cf Keay, S J (1991) "The *Ager Tarraconensis* in the Late Empire: a model for the economic relationship of town and country in eastern Spain?" in Barker, G and Lloyd, J (eds) Roman Landscapes: Archaeological Survey in the Mediterranean Region (London) p 85.

<sup>58</sup> cf Rosser Liminaña, P (1994) op. cit. n. 11 p 80-81. Rosser argues that towns during the late Empire decline in importance whilst peripheral *villae* continue as centres of population. Within this semi-urban periphery one should locate production centres such as that at Benalúa which continue to function beyond the apparent cessation of the associated urban centres.

<sup>59</sup> cf Pliny Epistulae 6,19.4.

<sup>60</sup> cf Balil, A (1959) op. cit. n. 18 p 293-294: the consul of 137 AD, P. Cornelius Balbinus came from Italica and may have been an ancestor of the short-lived emperor Balbinus; Nummius Aemilius Dexter, the consul of either 259 or 263 AD and Proconsul of Asia may have come from Barcino.

also enabled those concerned to escape from the increasingly onerous imperial requisitions or *munerae* which fell upon an ever shrinking provincial aristocracy - a process exacerbated by the proscriptions following the revolt of Albinus. Gradually the local aristocracy chose to withdraw to their increasingly independent rural estates thus severing the interdependence of supply between towns and their hinterland. As we saw in chapter four, much of the trade from the region, both in fish sauce and other commodities was in the hands of local aristocrats such as L. Herennius Optatus whose family may have included L. Licinius Sura amongst its friends and most notably in the case of fish sauce the Numisii who must have been amongst the worst hit by the decline of the local aristocracy in the face of increasing imperial exactions and it is perhaps significant that *gens* such as the Numisii and Baebii are not attested after the end of the Second Century AD. In withdrawing to their estates these men will have ceased investing in towns, but rather in the development of increasingly elaborate estates and the production of commodities to meet their own requirements without regard for wider commercialization, as for example, we see at Centcelles, Pared Delgada (Villaronga del Camp), San Boi de Llobregat, Els Munts, Vilarrenc and Torre Llauder.<sup>61</sup> Particularly significant in this regard is the suggestion we propounded in the previous chapter that the villa at Torre Llauder was owned by L. Herennius Optatus and seems to have been at its most prosperous during the Severan period.<sup>62</sup>

This decline in wealth available to be invested in towns and inter-provincial commerce was further exacerbated by the increasing efforts of the Imperial government to appropriate what remained of municipal revenue for its own use with the result that we see increasing signs of urban poverty. As early as the Second Century AD we see the appearance of *curatores* and *correctores* responsible for overseeing the finances of Emerita<sup>63</sup> and Hispalis<sup>64</sup>, whilst Rosser Liminaña has suggested that plague may also

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<sup>61</sup> cf Menéndez i Pablo, X and Solias i Aris, J Ma (1985) ‘Problemes entorn del Baix Imperi al curs inferior del Llobregat’ in *Pyrenae* 21 p 161-163; Ribas i Beltrán, M (1963) op. cit. n. 6 p 21; Keay, S J (1991) op. cit. n. 57 p 85.

<sup>62</sup> cf Prevosti, M (1995) ‘La Villa Romana de Torre Llauder (Mataró, Barcelona) in *JRA* 8 p 292-297; Prevosti, M and Clariana, J F (1987) ‘El Taller de anforas de Torre Llauder: nuevas aportaciones’ in *El Vi a l’Antiguitat: Economia, Produccio i Comerc al Mediterrani Occidental* Actes I Colloqui d’Arqueologia Romana (Museo de Badalona) Monografies Badalonines n. 9 p 199-210.

<sup>63</sup> *CIL* ii.484.

<sup>64</sup> *CIL* ii.1180.

have been a factor in the decline of Lucentum with the identification of black rats at Parque de las Naciones.<sup>65</sup> Although centres such as Dianium, Empuries, Baetulo and perhaps Ilerda appear to have been effectively abandoned by the end of the Third Century AD, the process was to an extent abated within towns of administrative or political importance<sup>66</sup> - a factor behind the demise of Emporiae, Iluro and Baetulo being perhaps their replacement by Barcino and Gerunda as administrative centres. Some management of local finances was evidently necessary at Tarraco with the attestation of Messius Marianus as Curator Rei Publicae Tarraconensis, although some maintenance of public buildings seems to have continued until the Fourth Century with the restoration of the *Thermae Montanarum* at this time,<sup>67</sup> the construction of the *Porticum Iovis*<sup>68</sup> and it is also possible that the theatre was restored.<sup>69</sup> However, although official sponsorship seems to have had a limited effect it was unable to alter the prevalent dynamic of a decline in the wealth of towns and the abandonment of civic centres. Thus, for example, we see the abandonment of lavish dwellings within Tarraco, at the modern *Placa de Toros* and the *Tabalcera* which were converted into a necropolis. The lower forum seems to have been destroyed by fire in the mid Fourth Century AD and there does not seem to have been any attempt at restoration. Parts of the administrative quarter of the upper town seem to have fallen into disuse by the end of the Fourth Century AD with the circus also being abandoned at this time.<sup>70</sup> Even where construction seems to have been carried out, as for example in the cases of the walls built at Gerunda between 290-300 AD and at Barcino in 270-310 AD as well as in the restoration of the harbour at Tarraco in the later Fourth Century AD<sup>71</sup> this will have been met with dwindling resources and must have been increasingly difficult to complete and maintain.

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<sup>65</sup> cf Rosser Liminaña, P (1994) op. cit. n. 11 p 74-76. Plague is attested within the empire during the reign of Marcus Aurelius, as well as being recorded as the cause of the deaths of the emperors Hostilian and Claudius II.

<sup>66</sup> cf for example, Bomgardner, D L (1981) "The Revolt of the Gordians and the Amphitheatre at Thysdrus (El Djem)" in King, A and Henig, M (eds) The Roman West in the Third Century: Contributions from Archaeology and History BAR Int. Ser. 109 (Oxford) p 211-214.

<sup>67</sup> cf Alföldy, G (1975) op. cit. n. 49 n. 155.

<sup>68</sup> cf Alföldy, G (1975) op. cit. n. 49 n. 91.

<sup>69</sup> cf Keay, S J (1984) op. cit. n. 29 p 554.

<sup>70</sup> cf Keay, S J (1984) op. cit. n. 29 p 554.

<sup>71</sup> cf Keay, S J (1984) op. cit. n. 29 p 555-556.

Bibilis seems to have entered a period of decline from the Second Century AD with the baths being abandoned by the end of the Third Century AD.<sup>72</sup> Similarly levels of abandonment are attested at Caesaraugusta in the Third Century AD<sup>73</sup> with the theatre seeming to have gradually fallen into disuse through the mid Third Century AD-mid Fourth Century AD. A similar date seems likely for the abandonment of Osca<sup>74</sup> and the baths excavated at Pompaelo were abandoned prior to the use of the site as a necropolis during the Fourth Century AD.<sup>75</sup>

Carthago Nova appears to have suffered a reduction in area during the Third Century AD with the absence of late Imperial ceramics from much of the east of the town.<sup>76</sup> During the Third and Fourth Centuries AD, however, we see the construction of a series of fortifications<sup>77</sup> although the town's recovery following the Third Century AD appears to have been a long one with the relative absence of Terra Sigillata Africana C compared to A and D wares and levels of destruction have been identified with C forms - predominately Hayes 50 wares - during soundings at Cuatro Santos nº 4. It seems to have been only during the second half of the Fourth Century AD that the town recovered its earlier prosperity - although the evolution of the town during this period remains paradoxical, its having been elevated to the status of a provincial capital during the reign of Diocletian.<sup>78</sup> Similarly within Valentia we see the abandonment during the Fourth Century AD of an industrial area devoted to the manufacture of glass.<sup>79</sup>

One must not, however, overplay the depiction of the Iberian Peninsula during late antiquity as having been marked purely by growing poverty and economic decline<sup>80</sup> and Ausonius and Avienus attest to Barcino and Bracara having been flourishing

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<sup>72</sup> cf Aguarod Otal, C (1991) Ceramica Romana Importada de Cocina en la Tarraconense (Zaragoza) p 25-26.

<sup>73</sup> cf Aguarod Otal, C (1991) op. cit. n. 72 p 27-31: Plaza de Santa Maria, C/ Torre Nueva 6. Necropoleis have been identified at Pº Echegaray y Caballero and C/ Predicadores 26.

<sup>74</sup> cf Aguarod Otal, C (1991) op. cit. n. 72 p 36-37.

<sup>75</sup> cf Aguarod Otal, C (1991) op. cit. n. 72 p 37.

<sup>76</sup> cf Ramallo Asensio, S F (1989) op. cit. n. 13 p 77-78.

<sup>77</sup> cf Ramallo Asensio, S F (1989) op. cit. n. 13 p 155-156 - associated materials, however, include Byzantine ceramics.

<sup>78</sup> cf Ramallo Asensio, S F (1989) op. cit. n. 13 p 158-159.

<sup>79</sup> cf Albiach Delsals, R and Soriano Sánchez, R (1991) 'Estudis de una 'domus' romana de Valentia y de los niveles que la amortizaban' in Saguntum 24 p 75-95.

<sup>80</sup> cf Curchin, L A (1991) The Local Magistrates of Roman Spain (Toronto) p 115-120.

centres at this time.<sup>81</sup> The growth of luxurious *villae* attest to the survival of a wealthy aristocracy within the region<sup>82</sup> although it is perhaps worth noting that although the wealth of these *villae* appears to have increased, their numbers are far fewer than those attested during the First Century AD<sup>83</sup> and as Curchin has pointed out if the local aristocracies were attempting to evade their responsibilities - for which considerable concern appears to have been expressed in the Theodosian Code - then their flaunting of their wealth through their construction of luxurious estates would surely have proved self-defeating.

Whether caused by the barbarian incursions of the Third Century AD or as a consequence of a more gradual drain of wealth away from urban centres, the most striking economic trend of the late Empire is the growing dominance of the N. African provinces in the markets of the Western Mediterranean. Although this would imply that sufficient wealth and interest remained in the towns of the region to import such commodities it must also raise into question the debilitation of local production.

The extent of North African commerce is particularly well attested with the appearance of African Red Slip pottery which is the most abundant imported ceramic form within the region from the First Century AD.<sup>84</sup> The earliest form, Terra Sigillata Africana A appears to have originated in the area of Carthage and to have begun to be exported to Italy prior to AD 79, appearing in Tarraconensis from the reign of Domitian.<sup>85</sup> The vessels become particularly prevalent, however, from the late Second to Third Centuries AD, before being replaced from the Antonine-Severan period by Terra Sigillata Africana C wares the diffusion of which coincides with that of Africana I Piccola amphora from c AD 160. Africana C forms dominated the Mediterranean market from the Third to the Fifth Centuries AD and are particularly prevalent within

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<sup>81</sup> cf Avienus OM 520; Ausonius Urb. 13, Par. 15.26.11-12.

<sup>82</sup> cf Balil, A (1965) "Aspectos sociales del Bajo Imperio" in Latomus 24 p 886-904.

<sup>83</sup> cf Curchin, L A (1991) *op. cit.* n. 80 p 119-120.

<sup>84</sup> cf Reynolds, P (1993) Settlement and Pottery in the Vinalopó valley (Alicante, Spain) AD 400-700 BAR Int. Ser. 588 (Oxford) p 10-11.

<sup>85</sup> cf Carandini, A (1983) "Pottery and the African Economy" in Garnsey, P D A, Hopkins, K and Whittaker, C R (eds) Trade in the Ancient Economy (Berkeley) p 145-162; cf also Hayes, J W (1972) Late Roman Pottery (London) p 13-18; Aquilué Abadias, J (1987) Las Cerámicas africanas de la ciudad romana de Baetulo (Hispania Tarraconensis) BAR Int. Ser. 337 (Oxford) p 10-13, 203; Tortorella, S (1986) "La ceramica fine da mensa africana dal IV al VII secolo d C" in Giardini, A (ed) Società Romana e Impero Tardo-antico: Le Merci gli Insediamenti (Bari) p 211-225.

coastal sites of *Tarraconensis*. *Terra Sigillata Africana D* appears to have been most widespread during the mid Fourth to mid Fifth Centuries AD with a more southerly production- that of *Terra Sigillata Africana E* also being identified at this time. Although this is not the place to attempt to catalogue all the attested finds of *Terra Sigillata Africana* within Eastern *Tarraconensis*, the ubiquity of these vessels is an indication of the dominance that amphora-borne African products were able to achieve.

As well as fine wares, African trade can also be adjudged by the distribution of coarse ware vessels. These appear to have been produced in the vicinity of the kilns devoted to the manufacture of *Terra Sigillata Africana*, although their import into *Tarraconensis* begins in the Augustan period and continues until the Seventh Century AD.<sup>86</sup> Vessels are concentrated within the coastal regions of the province extending up the R. Ebro to *Vareia* and *Pompaelo*. Finds within the interior are more sporadic and rare. Production seems to decline during the Fifth Century AD and to shift away from trade with Rome to that of the East. Contacts with the sites of *Cataluña* and the Levant seem to have continued through the Vandal period and to have only ended with the Byzantine restoration of the *annona* in the Sixth Century AD.<sup>87</sup>

Such ceramics will have been carried as a secondary cargo to a staple amphora-borne commodity and it is through the exchange of these vessels that we have the fullest evidence for the exchange of North African products - principally oil and fish sauce. *Tripolitana I* amphora first appear at the end of the First Century BC and survive into the Fourth Century AD being distributed across the Eastern Mediterranean.<sup>88</sup> By the Antonine period distributions of olive oil were introduced at Rome with a *Procurator ad olea comparanda per regionem Tripolitanam* being attested by the reign of Severus or Severus Alexander,<sup>89</sup> a process that is reflected in the introduction of *Tripolitana III* amphorae. These vessels are dated by deposits from Ostia to the Second-Third Centuries AD and are normally associated with the transport of olive oil

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<sup>86</sup> cf Aguarod Ojal, C (1991) op. cit. n. 72 p 235-240.

<sup>87</sup> On the effects of the Vandal and Byzantine invasions on the economy of North Africa, cf Fulford, M (1980) 'Carthage: Overseas Trade and the Political Economy, c AD 400-700' in Reading Medieval Studies 6 p 68-79.

<sup>88</sup> cf Peacock, D P S and Williams, D F (1986) Amphora and the Roman Economy (London) p 166-168.

<sup>89</sup> cf Keay, S J (1984) Late Roman Amphorae in the Western Mediterranean: A typology and economic study. The Catalan evidence BAR Int. Ser. 196 (Oxford) p 406-408.

from the region of Leptis Magna and Oea.<sup>90</sup> Examples of the form are found at a number of sites within Tarraconensis: Placa Rovellet, Torre de Audiencia and San Fructuoso in Tarraco itself, at Barcino and the Palaiapolis of Empuries.<sup>91</sup> The presence of the form within the cemetery of Pere Martell, Tarraco is dated to the first half of the Third Century AD whilst those from San Fructuoso postdate the early Fourth Century AD. Those from early Sixth Century AD levels within the Palaiapolis of Empuries are probably residual.<sup>92</sup>

More indicative of the rise of African production are those amphorae produced in the Sahel region of Tunisia: principally Africana I Piccola and Africana II Grande forms. Olive oil from the region begins to appear in Rome during the mid Second Century AD with Juvenal referring to its presence during the reign of Hadrian<sup>93</sup> - a date that matches the incidence of Ostia LIX and XXIII amphora at Ostia.<sup>94</sup> The earliest to appear within the region are Africana I Piccola amphora which are attested at Empuries from the Third Century AD, although they appear at Ostia from 140-180/190 AD.<sup>95</sup> Although there is no direct evidence for the contents of these amphorae, stamps record their production within the ports of Hadrumentum, Sullectum and Leptis Minor<sup>96</sup> with several being found associated with fish vats at Sullectum bearing the stamp ASYLL.<sup>97</sup> Their use in the transport of oil has also been suggested.<sup>98</sup>

More widely attested within the Peninsula are Africana II Grande vessels, although Keay has noted there is a wider degree of typological variations within this form which may reflect a more diversified production area.<sup>99</sup> They are most commonly associated with the transport of olive oil and their absence from the Roman town at Empuries suggests that they arrived post the later Third Century AD.<sup>100</sup> Keay V

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<sup>90</sup> cf Peacock, D P S and Williams, D F (1986) op. cit. n. 88 p 169-170.

<sup>91</sup> cf Keay, S J (1984) op. cit. n. 89 p 407.

<sup>92</sup> cf Keay, S J (1984) op. cit. n. 89 p 136.

<sup>93</sup> Juvenal *Satires* 5. 88.

<sup>94</sup> cf Keay, S J (1984) op. cit. n. 89 p 408.

<sup>95</sup> cf Keay, S J (1984) op. cit. n. 89 p 100-109; cf also Zevi, F and Tchernia, A (1969) "Amphores de Byzacène au Bas-Empire" in *Antiquités Africaines* 3 p 173-214.

<sup>96</sup> cf Zevi, F and Tchernia, A (1969) op. cit. n. 95 p 177-184.

<sup>97</sup> cf Foucher, L (1968) "Note sur l'industrie et le commerce des Salsamenta et du Garum" in *93e Congrès national de Sociétés Savantes: Tours 1968* p 17-21.

<sup>98</sup> cf Keay, S J (1984) op. cit. n. 89 p 108.

<sup>99</sup> cf Keay, S J (1984) op. cit. n. 89 p 411.

<sup>100</sup> cf Keay, S J (1984) op. cit. n. 89 p 111-113.

(Africana II A) amphora may, however, date to the late Second Century AD.<sup>101</sup> The relative scarcity of the form from the Paleochristian cemetery at Tarraco would suggest that exports declined from the Fourth Century AD, although they are attested at Vilauba from Sixth Century levels and from the late Fourth-early Fifth Century AD at Saguntum.<sup>102</sup> Although the form is most usually associated with oil, production is attested within the vicinities of Leptis Minor, Sullethum and Hadrumentum.<sup>103</sup> A *titulus* reading 'olei' is attested<sup>104</sup>, however, an example found containing a resin lining would suggested that fish sauce was also carried.

From the early Fourth Century AD, however, we see a dramatic rise both in the number of types and quantities of North African amphorae being imported into the Levant<sup>105</sup> - the most important of which are Keay XXV and XXVII forms (**fig. 43.3,4,6**). The scale of this trade being shown by Keay XXV vessels accounting for 16.8 % of the late amphorae from the Baths of the Swimmer at Ostia.<sup>106</sup> Kilns producing this form have been found at Ariana (near Carthage) and Thaenae and are attested from the Fourth to the Fifth Centuries AD.<sup>107</sup> Although African amphorae from this period are commonly associated with olive oil, examples of this form from the Dramont F wreck contain a resin lining,<sup>108</sup> whilst those from La Pointe de la Luque<sup>109</sup> and La Pampelonne contain the remains of fish.<sup>110</sup> Keay XXVII amphorae appear to have been an evolution of the earlier Africana II Grande vessels that were produced in Tunisia, although Keay believes them to have been related to Keay XXV forms. Typological and petrological similarities point to these vessels having been produced

<sup>101</sup> cf Keay, S J (1984) op. cit. n. 89 p 115.

<sup>102</sup> cf Aranegui Gascó, C, López Piñol, M and Orfila Pons, M (1991) "Ánforas tardorromanas en el Grau Vell" in *Saguntum* 24 p 120-121.

<sup>103</sup> cf Keay, S J (1984) op. cit. n. 89 p 116, 123.

<sup>104</sup> cf Keay, S J (1984) op. cit. n. 89 p 123; cf also Zevi, F and Tchernia, A (1969) op. cit. n. 95 p 187.

<sup>105</sup> cf Keay, S J (1984) op. cit. n. 89 p 414-415.

<sup>106</sup> cf Keay, S J (1984) op. cit. n. 89 p 416.

<sup>107</sup> cf Keay, S J (1984) op. cit. n. 89 p 193.

<sup>108</sup> cf Liou, B (1975) "Recherche sous-marines" in *Gallia* 31 p 599-600.

<sup>109</sup> cf Liou, B (1975) op. cit. n. 108 p 579.

<sup>110</sup> cf Lequement, R (1976) "Une epave du Bas-empire dans la baie de Pampelonne (presqu'île du Sainte-Tropez)" in *Revue Archeologique du Narbonnaise* 9 p 177-190; Tortorella, S (1981) "Ceramica di produzione africana e rinvenimenti archeologici sottomarini della media e tarde Età Imperiale: analisi dei dati e dei contributi reciproci" in *MEFRA* 93 p 363-377; Garcia Villanueva, I and Roselló Mesquida, M (1992) "Las anforas Tardorromanas de Punta de l'Illa de Cullera" in *Estudios de Arqueologia Iberica y Romana. Homenaje a Enrique Pla Ballester* TV del SIP 89 (Valencia) p 642.

within Tunisia, on which basis olive oil is favoured as their contents.<sup>111</sup> They appear within Cataluña in contexts dated to the Fourth-Fifth Century AD being attested at the Paleochristian necropolis at Tarraco, whilst examples from Placa Rovellat predate the Sixth Century AD. A similar date is given for those at Ostia, whilst they have been found in contexts dated to the period 450-525 AD at Carthage.

Africa seems to have continued to prosper beyond the conclusion of the Empire in the west and Fulford has suggested that the Vandal conquest, in freeing the region from the demands of Rome and Constantinople encouraged economic prosperity.<sup>112</sup> Although our knowledge of Tunisian amphorae during this period is more problematic<sup>113</sup> production does seem to have continued on a substantial scale with oil amphorae reaching the markets exploited by earlier forms. The cessation of production of Keay XXV and XXVII vessels may, however, represent a reorganisation of the industrial basis of production. It is clear, however, that the region was a prosperous one with African imports into Eastern Tarraconensis reaching their peak at this time. The reimposition of Byzantine control in 534 AD and the taxation, confiscations and building programs associated with this seem to have had a detrimental effect on the North African economy with the gradual disappearance of African amphorae from Tarraconensian sites during the late Sixth Century AD.<sup>114</sup>

Traditionally the scale of African amphora-borne commerce is said to have brought about the cessation of Tarraconensian production.<sup>115</sup> Unfortunately the interpretation of the local production of amphorae during the Third-Fourth Centuries AD is difficult to substantiate as no kiln site has been dated to this period,<sup>116</sup> although the fabric of the vessels would point to their having been produced in the same areas as during the First and Second Centuries AD. Although a number of types appear to have been produced they are unrelated to the earlier forms of production and may represent either a transformation of the productive systems within the region or the prevailing

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<sup>111</sup> cf Keay, S J (1984) op. cit. n. 89 p 219-224.

<sup>112</sup> cf Fulford, M (1980) op. cit. n. 87.

<sup>113</sup> cf Keay, S J (1984) op. cit. n. 89 p 420-427.

<sup>114</sup> cf Keay, S J (1984) op. cit. n. 89 p 427-428.

<sup>115</sup> The ubiquity of African amphorae negates the possibility of outlining their distribution within the region - suffice it to say that they are concentrated within coastal sites. For more detail the reader is referred to Keay, S J (1984) op. cit. n. 89.

<sup>116</sup> cf Keay, S J (1984) op. cit. n. 89 p 400-401.

influence of North African forms. Keay notes that their limited incidence points to their having been used for local consumption.<sup>117</sup> Almagro 50 amphorae are normally associated with a Southern Spanish origin being attested through the late Second-early Third Centuries AD (**fig. 43.1**).<sup>118</sup> Typological similarities with earlier forms of fish sauce amphorae and their coincidence at kiln sites such as Puerto Real has suggested that these vessels were used to produce fish sauce.<sup>119</sup> Examples are found across the Western Mediterranean and within Eastern Tarraconensis at Empuries, Tarraco, Barcino, La Salut and L' Alcudia de Elche.<sup>120</sup> Those from Tarraco, Barcino and La Salut appear to have been a local copy of the form (classified as Keay XVIC amphorae) being defined by a piriform body, a hollow point, high arched handles, a simple rim that is circular in profile with some traces of riling on the external face of the vessel.

Amongst the multifarious typological variants of Keay XXV amphorae discussed above, Keay XXV<sub>k</sub> forms have been identified at Tarraco and Barcino as having been produced within the locality and are characterised by a more simplified rim form than that of the more widespread variants (**fig. 43.4**).<sup>121</sup> A rim similar to these was found at the Schola Praeconum, Rome where it is dated to 430-440 AD, those from the wreck of L'Anse Gerbal are dated to the early Fifth Century AD whilst an example from Luni is dated to the late Fourth-early Fifth Centuries AD.<sup>122</sup> Almagro 51c amphorae have been identified at the Estruch cemetery at Empuries and have been attested from a number of sites along the coast of Eastern Tarraconensis: Barcino, Vilauba, Tarraco, Can Bosc de Basea, La Guanta, Can Samarruga, Les Foies, Elche, Cartagena and Les Escolletes.<sup>123</sup> They are characterised by a piriform body, a short, narrow neck, the handles are attached to the upper body and are elliptical in section whilst the body tapers to a narrow foot with a cylindrical point (**fig. 43.2**).<sup>124</sup> There is little indication as to the origin and contents of this form although Portugal is possible

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<sup>117</sup> cf Keay, S J (1984) op. cit. n. 89 p 401.

<sup>118</sup> cf Keay, S J (1984) op. cit. n. 89 p 149-155; cf also Peacock, D P S and Williams, D F (1986) op. cit. n. 88 p 130-131.

<sup>119</sup> cf Keay, S J (1984) op. cit. n. 89 p 405-406.

<sup>120</sup> cf Keay, S J (1984) op. cit. n. 89 p 644.

<sup>121</sup> cf Keay, S J (1984) op. cit. n. 89 p 187.

<sup>122</sup> cf Keay, S J (1984) op. cit. n. 89 p 196.

<sup>123</sup> cf Keay, S J (1984) op. cit. n. 89 p 646-647.

<sup>124</sup> cf Keay, S J (1984) op. cit. n. 89 p 172-173; Peacock, D P S and Williams, D F (1986) op. cit. n. 88 p 132-133.

as a source. They are typologically similar to Almagro 51 a and b forms<sup>125</sup> which have been found to contain fish bones.<sup>126</sup> The examples of the form from the Escolletes I wreck have been dated to the Third Century AD,<sup>127</sup> whilst those from the Paleo-Christian cemetery at Tarraco are dated to the Fourth-Fifth Centuries AD,<sup>128</sup> a date which appears to have been the norm for the vessel. The form is widely attested across the Western Mediterranean and represents the continuation of the commerce of fish sauce from the Peninsula during the Fourth and Fifth Centuries AD.

Less well attested are Keay LXVIII vessels which have been identified as predating the Sixth Century AD at Tarraco.<sup>129</sup> There is no indication as to the contents of the vessels although the fabric points to an origin in Cataluña. A single example of a Keay LXXXVI amphora from Barcino appears to have been produced locally.<sup>130</sup> Three examples of Keay XCI a and b amphora have been identified from Tarraco and Barcino where they are dated to the Third-Fourth Centuries AD.<sup>131</sup> They possess a small piriform body, a low neck and elliptical handles (**fig. 43.7**). There is no indication of contents although the fabric points to a Catalan origin.

Thus although the production of amphora within North Eastern Tarraconensis continues through the Fifth-Sixth Centuries AD, the forms appear to have served only for local consumption, whilst the more widely attested forms that appear - Almagro 50 and Almagro 51c seem only to have been locally produced imitations satisfying the local market. This contraction is symptomatic of the breakdown of the interaction between town and country and thus the relationship between the local economy and the 'central' economy as identified by Keay.<sup>132</sup> Thus although centres such as Tarraco continue to import foodstuffs - particularly as we have seen from North Africa - there is a dramatic decline in locally produced wares. This is matched by the isolation of rural

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<sup>125</sup> cf Keay, S J (1984) op. cit. n. 89 p 156-168.

<sup>126</sup> cf Keay, S J (1984) op. cit. n. 89 p 160.

<sup>127</sup> cf Mas, J (1985) 'El poligono submarino de Cabo de Palos. Sus aportaciones al estudio del trafico maritimo antiguo' in VI Congreso Internacional de Arqueología Submarina Cartagena 1982 (Cartagena) p 164.

<sup>128</sup> cf Keay, S J (1984) op. cit. n. 89 p 178.

<sup>129</sup> cf Keay, S J (1984) op. cit. n. 89 p 359-360.

<sup>130</sup> cf Keay, S J (1984) op. cit. n. 89 p 379.

<sup>131</sup> cf Keay, S J (1984) op. cit. n. 89 p 382-384.

<sup>132</sup> cf Keay, S J (1991) op. cit. n. 57 p 79-87.

sites from imported pottery. Whittaker<sup>133</sup> has suggested that the commercial networks of late antiquity came to be divorced from urban centres and to be based upon estate exchange - perhaps in the form of the gift exchange undertaken by Ausonius and Paulinus.<sup>134</sup> The focus of the exchange mechanisms may have shifted to entrepôt such as Peñón d' Ifach which seems to have been reoccupied at this time and Aranegui has suggested that the site served to safeguard the trade routes along the coast.<sup>135</sup> Similar late occupation levels have been found at Isla de Portitchol (pl. 26) and Tabarca which may have served a similar function.

A number of such sites have been identified along the coasts of Murcia in the hinterland of Cartagena which seem to have acted as centres of trade in fish sauce during the Fourth-Fifth Centuries AD and to have had contacts with North Africa and even the Eastern Mediterranean. The first of these lies at Aguilas where excavations undertaken in 1980 have identified a small kiln devoted to the production of amphorae at the end of the Fourth Century AD.<sup>136</sup> The reasons for the brevity of the operation of the site are unclear, although it seems to have engaged in the production of small amphorae that were used in the exchange of fish sauce. The vessels produced on the site possess a long, thin cylindrical body tending towards a fusiform type, a simple rounded lip, a long pointed base that differs little from the main body of the amphora and a single handle, oval in section is attached to the shoulder of the vessel (fig. 44.1).<sup>137</sup> Finds of Terra Sigillata Africana D from the site afford a date in the Fourth-Fifth Centuries AD.<sup>138</sup> Quantities of amphorae similar to those from Aguilas have also been found at El Castellar, the principal differentiation being that they possess two

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<sup>133</sup> cf Whittaker, C R (1983) "Late Roman Trade and Traders" in Garnsey, P D A, Hopkins, K and Whittaker, C R (eds) *Trade in the Ancient Economy* (London) p 163-180.

<sup>134</sup> cf *Epistle* 25 for the exchange of Muria.

<sup>135</sup> cf Aranegui Gasco, A and Bazzana, A (1980) "Vestiges de structures défensives d' Époque Romaine Tardive et d' Époque Musulmane au Peñón d' Ifac (Calpe, province d' Alicante)" in *MCV* 16 p 421-436.

<sup>136</sup> cf Ramallo Asensio, S F (1984) "Algunas consideraciones sobre el Bajo Imperio en el litoral murciano: los hallazgos romanos en Aguilas" in *AUM* 42.3-4 p 99-115; Ramallo Asensio, S F and Arana Castillo, R (1985) "Envases para salazon en el Bajo Imperio" in *VI Congreso Internacional de Arqueología Submarina* Cartagena 1982 (Cartagena) p 436.

<sup>137</sup> cf Ramallo Asensio, S F (1984) op. cit. n. 136 p 113; Ramallo Asensio, S F and Arana Castillo, R (1985) op. cit. n. 136 p 436.

<sup>138</sup> cf Ramallo Asensio, S F (1984) op. cit. n. 136 p 115; Ramallo Asensio, S F and Arana Castillo, R (1985) op. cit. n. 136 p 436.

symmetrical handles (**fig. 44.2**).<sup>139</sup> Finds of Terra Sigillata Africana D again point to the occupation of the site from the Fourth to Fifth Centuries AD. Although no kiln has been identified on the site the existence of such may be evidenced by the discovery of deformed amphorae within the deposit. Similar criteria locate a kiln at Mazarrón where vessels similar to those of Aguilas and El Castellar seem to have been produced (**fig. 44.3**). Activity on the site may date back to the early empire with the identification of Beltrán II A and III B vessels on the site, whilst finds of Terra Sigillata Africana D point to the continuation of the settlement to the Fifth Century AD.<sup>140</sup>

*Spatheia* of this type appear at a number of sites within South Eastern Tarraconensis being attested within the Visigothic necropolis at Vistalgre (Aspe)<sup>141</sup> and within Fourth-Fifth Century levels at Hort de Morand, Denia.<sup>142</sup> Examples of this form have been found predominantly within coastal communities of the East coast: at Cartagena, Cabezo Roenas, Jumilla, L' Alcudia de Elche, Orihuela and Mojon.<sup>143</sup> They are less widely distributed than earlier fish sauce amphora form and may in fact represent a local imitation of Tunisian Keay XXVI *Spatheia* forms,<sup>144</sup> which first appear in the Constantinian basilica on the Via Labicana in Rome dated to the early to mid Fourth Century AD and in levels dated to 360-440 AD at Carthage, although the vessels are most commonly associated with the Sixth Century AD. Fabric and typological similarities with Keay XXV forms point to a Tunisian source, although Keay XXVI I variants appear to have South Spanish fabric.

Although wine has been suggested as the contents of these vessels, and examples from the Dramont E wreck have been found to contain olive pips,<sup>145</sup> they were most probably used to transport fish sauce. Examples have been found within a complex at Avenida Dr Gadea (Benalúa) which contained a number of tanks used in the preparation of salt fish, two kilns, store rooms and what appears to have been an area

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<sup>139</sup> cf Ramallo Asensio, S F (1984) op. cit. n. 136 p 120-122; Ramallo Asensio, S F and Arana Castillo, R (1985) op. cit. n. 136 p 436.

<sup>140</sup> cf Ramallo Asensio, S F and Arana Castillo, R (1985) op. cit. n. 136 p 437-438.

<sup>141</sup> cf Reynolds, P (1993) op. cit. n. 84 p 71-72.

<sup>142</sup> cf Reynolds, P (1993) op. cit. n. 84 p 83-84.

<sup>143</sup> cf Ramallo Asensio, S F and Arana Castillo, R (1985) op. cit. n. 136 p 441-442.

<sup>144</sup> cf Keay, S J (1984) op. cit. n. 89 p 212-219.

<sup>145</sup> cf Parker, A J (1992) Ancient Shipwrecks of the Mediterranean and the Roman Provinces BAR Int. Ser. 580 (Oxford) p 168.

devoted to the preparation of salted fish.<sup>146</sup> The complex is dated from the Augustan period and conforms to the criteria established in chapter three as having been characteristic of fish factories and it may be associated with the attestation of Fourth-Fifth Century AD burials at Calle de Alberola/Calle de Foglietti/Bar Bernadino.<sup>147</sup> Examples of the form have been found with fish bones in three tanks lined with *opus signinum* that have been identified at Mazarrón.<sup>148</sup> The deposition of ceramic finds has suggested that the site entered a period of economic decline, perhaps as a consequence of the Third Century crisis. Further remains may, however, correct this view. Further remains may, however, alter this view.<sup>149</sup> Significant also is the identification of the nearby necropolis of La Molineta<sup>150</sup> which seems to be contemporary with the Fourth-Fifth Century AD cemetery of San Anton, Cartagena. As regards the existence of a population centre one should note the possible identification of baths at Mazarrón<sup>151</sup> and those excavated in the Eighteenth Century at Aguilas.<sup>152</sup> Production of amphorae at the latter may have gone to supply the nearby fishery at Isla del Fraile where a large basin lined with *opus signinum* has been found and which appears to be dated to the Fourth-Fifth Centuries AD.<sup>153</sup> The presence of *spatheia* of this type at Baños de la Reina, Calpe may point to the continuation of this site into the late Empire.<sup>154</sup>

A further complex may be attested at La Albufereta where a fish trap and tank lined with *opus signinum* have been found adjoining burials dated to the Fourth-Fifth Centuries AD.<sup>155</sup> It is also possible that the fishery at La Isleta (Campello) may have continued beyond the Third Century AD.<sup>156</sup> It is worth recalling that the fish factory excavated at Santa Pola can be dated to the end of the Fourth Century AD with finds of Terra Sigillata Africana A wares dated to the period 320-380/400 AD.<sup>157</sup> The fishery

<sup>146</sup> cf Reynolds, P (1993) op. cit. n. 84 p 54.

<sup>147</sup> cf Reynolds, P (1993) op. cit. n. 84 p 54.

<sup>148</sup> cf Ramallo Asensio, S F (1984) op. cit. n. 136 p 118-120; Ramallo Asensio, S F and Arana Castillo, R (1985) op. cit. n. 136 p 441; Ramallo Asensio, S F (1989) op. cit. n. 13 p 142.

<sup>149</sup> cf Ramallo Asensio, S F (1984) op. cit. n. 136 p 119.

<sup>150</sup> cf Ramallo Asensio, S F (1984) op. cit. n. 136 p 119-120.

<sup>151</sup> cf Ramallo Asensio, S F (1984) op. cit. n. 136 p 123.

<sup>152</sup> cf Ramallo Asensio, S F (1984) op. cit. n. 136 p 110-113.

<sup>153</sup> cf Ramallo Asensio, S F (1984) op. cit. n. 136 p 122-123.

<sup>154</sup> cf Reynolds, P (1993) op. cit. n. 84 p 125.

<sup>155</sup> cf Reynolds, P (1993) op. cit. n. 84 p 47-48.

<sup>156</sup> cf Reynolds, P (1993) op. cit. n. 84 p 45-46.

<sup>157</sup> cf Sánchez Fernandez, Ma J, Blasco, E and Guardiola, A (1989) 'Descubrimiento de una factoría bajoimperial de salazón de pescado en Santa Pola (Alicante)' in *Saguntum* 22 p 420.

located at the Isla de Tabarca has also afforded evidence of occupation during the Fourth-Fifth Centuries AD.<sup>158</sup> Occupation at Punta de l'Arenal may have continued until the Seventh Century AD, although it is unclear whether the fishery was operating at this date (fig. 45.1-4).<sup>159</sup>

The most well known of the late Imperial fisheries is located at Rosas where a fish salting complex was excavated in 1979-1980.<sup>160</sup> The late Roman villa seems to have been constructed on the site of earlier Hellenistic occupation during the mid to later Fourth Century AD on the basis of finds of Terra Sigillata Africana A and D.<sup>161</sup> Numismatic evidence also supports a Fourth Century AD date.<sup>162</sup> The site seems to have remained in continuous use before being systematically abandoned during the mid Sixth Century AD with Terra Sigillata Africana D and Late Roman C wares being attested.<sup>163</sup>

Less reliably dated are the fisheries at Galifa, Castillico and San Ginés<sup>164</sup> which may also be dated to the late Empire. Large quantities of late Imperial Terra Sigillata have been found at La Azohía which may have seen a continuation of fishing activities during this period.<sup>165</sup> A similar function is possible for the settlement of Portichol where ceramic finds, particularly of Terra Sigillata Africana D and Terra Sigillata Lucente attest to occupation during the Third and Fourth Centuries AD.<sup>166</sup>

We therefore see the survival of a series of commercial enclaves which appear to have maintained contact with North Africa and possibly even the Eastern Mediterranean. Centres such as Mazarrón, Punta de l'Arenal, Santa Pola and Rosas

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<sup>158</sup> cf Rosser Liminaña, P (1994) op. cit. n. 11 p 86-87.

<sup>159</sup> cf Reynolds, P (1993) op. cit. n. 84 p 84-85, for more detail cf n. 24.

<sup>160</sup> cf Nolla, J M and Nieto, F J (1981) "Una factoria de salao de peix a Roses" in *Fonaments* 3 p 187-200; Nolla, J M (1984) "Excavaciones recientes en la ciudadela de Rosas: el edificio bajo-imperial" in Keay, S J, Jones, R F J and Blagg, T (eds.) *Papers in Iberian Archaeology* BAR Int. Ser. 193 p 430-450.

<sup>161</sup> cf Nolla, J M (1984) op. cit. n. 160 p 444.

<sup>162</sup> cf Nolla, J M (1984) op. cit. n. 160 p 445.

<sup>163</sup> cf Nolla, J M (1984) op. cit. n. 160 p 446-447.

<sup>164</sup> cf Garcia del Toro, J R (1978) "Garum Sociorum: La industria de salazones de pescado en la Edad Antigua en Cartagena" in *AUM* 36.1-2 p 56-57; Ramallo Asensio, S F (1984) op. cit. n. 136 p 123; Ramallo Asensio, S F (1989) op. cit. n. 13 p 136-144.

<sup>165</sup> cf Ramallo Asensio, S F (1984) op. cit. n. 136 p 115-117; Ramallo Asensio, S F (1989) op. cit. n. 13 p 136-144.

<sup>166</sup> cf Martin, G and Serres, Ma D (1970) op. cit. n. 23 p 95-96; Segarra Llamas, J (1947) "La isla de Portichol (Javéa)" in *Saitabi* 6 p 48-55.

seem to have functioned as economic centres in the manner identified during the early Empire as *vicus* production. The association of late Imperial fisheries with necropoleis and occasionally baths has suggested the employment of a migrant workforce although the continuity of these sites suggests a role economic centres capable of supporting a dependant population. Such accords with the growing regionalism of rural settlement during the Fourth-Sixth Centuries AD with the concentration upon *villae* and churches, hence for example, we know of a 'Visigothic' basilica overlying the Villa Fortunatus at Fraga. At other sites, however, we see a deliberate abandonment, as for example, at Vilauba and Rosas.<sup>167</sup> Although literary sources such as Isidore<sup>168</sup> and Procopius<sup>169</sup> speak of the continued trade with Gaul, North Africa and also the East after the Byzantine reconquest of Baetica in 552 AD, Keay<sup>170</sup> cites the decline of imports by the end of the Sixth Century AD. Although clearly wealth remained within the region to judge by the fines included within the law codes of Leovigild<sup>171</sup>, such was increasing concentrated in the hands of the Visigothic court at Toletum and in the church. Towns no longer appear to have served as market centres for the hinterland and to have concentrated rather upon their ecclesiastical role. Commercial activities come to be controlled either through 'tied trade' with the church or the Royal court, or as seems to have been more normal within Eastern Tarraconensis, through rural-based estate systems of exchange. Such transactions seem to have been centred in a number of non-urban vici engaged in the production of amphorae and fish sauces, which will have been exchanged without recourse to the urban economic structure. It is perhaps in the predominately non-urban character of Tarraconensian fish sauce production during the Imperial period, that it was able to survive the disturbances of the Second-Third and Fifth Centuries AD. What is most striking is the essential continuity, at least of production, between the Early and Late Empire and we are perhaps not so much concerned with a decline but the restoration of a more localised villa-based economy that characterised the Peninsula during the First Century BC.

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<sup>167</sup> cf Keay, S J (1984) op. cit. n. 29 p 564.

<sup>168</sup> *De Viris Illustribus* 35.

<sup>169</sup> iii.24.11.

<sup>170</sup> cf Keay, S J (1984) op. cit. n. 29 p 564.

<sup>171</sup> cf Keay, S J (1984) op. cit. n. 29 p 563.

## CONCLUSION

At the beginning of this thesis we had recourse to the adage of Sir Moses Finley as to the lack of development and small scale of the Roman economy and much of what has been said since has been shaped, whether adversely or positively, by the economic discourse that his work has begun. The reappraisal of the traditional sources in the light of more purely economic analysis and through archaeological evidence has enabled a more thorough knowledge of the economic currents that motivated antiquity. However, much of our evidence remains subjective and open to widely disparate views as to the scale and importance of the ancient economy. With the risk of adding yet more wood to the proverbial fire it is hoped that by considering a specific attribute of the ancient market some understanding of the wider currents may be achieved.

Despite its long having been recognized as a feature of the ancient world, fish sauces are still often ignored in favour of more prominent aspects of the ancient economy such as the production of pottery and the operation of *villae*, or more popular fields of research such as the manufacture and trade of wine and olive oil for which the Guadalquivir valley and the provinces of North Africa have achieved particular attention. A number of works written over the last thirty years have served to draw attention to the role of the fish salting industry<sup>1</sup>, however, the scale and importance of these activities still remain subject to considerable debate.<sup>2</sup> The dramatic increase in archaeological survey in the last twenty years has led to the recognition of far more sites relating to the production of fish sauces and most significantly located them in regions that were previously considered marginal in comparison to the long attested sites of the Straits of Gibraltar. Not only is it becoming clear that much of the Mediterranean coastline was actively engaged in the exploitation of these resources but that the Atlantic and more northerly provinces were also so engaged. One such

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<sup>1</sup> cf Ponsich, M and Tarradell, M (1965) Garum et les industries antiques de salaison dans la Mediterranee Occidentale (Paris); Edmondson, J C (1987) Two Industries in Roman Lusitania BAR Int. Ser. 362 (London); Ponsich, M (1988) Acete de Oliva y Salazones de Pescado: Factores Geo-Economicos de Betica y Tingitania (Madrid); Curtis, R I (1991) Garum and Salsamenta: Production and Commerce in Materia Medica (Leiden).

<sup>2</sup> cf Gallant, T W (1985) A Fisherman's Tale *Miscellanea Graeca* 7 (Ghent).

marginal area is to be found within the Eastern coastline of Hispania Tarraconensis where only thirty years ago Ponsich and Tarradell could cite the existence of only a scatter of production sites, we can now envisage a flourishing industry dominating much of the levantine coast. Although one cannot speak of as substantial individual installations as are found within Baetica, their marked frequency points to their having served an important role in the economies of the coastal *villae* of the region. Through the development of this industry as well as its interaction with other aspects of the regional economy one can define the relative scale of the ancient economy and the causative factors thereof.

The first and perhaps most important conclusion to be drawn is of the ubiquity of fish sauces in the ancient world. The frequent moral criticisms of its character point to an underlying appeal and popularity on the dinner tables of ancient Rome, yet the use of fish sauce can be traced back to the cultures of the ancient Near East being brought to the Iberian Peninsula by the colonizing movements of the Eighth Century BC becoming an important component in the economies of the Phoenician settlements of the Straits of Gibraltar and in their exchange with the native communities along the East coast. The prevalence of Phoenician trade at this time resulted not only in the importation of goods from the colonies along the south coast and on Ibiza, but also in the local imitation of Phoenician production. From the later Eighth Century BC these colonies seem to have developed into important communities in their own right with clear indications of wealth and social stratification seeing the importation of luxury goods from the Eastern Mediterranean. Such economic growth is no doubt related to the increased exploitation of the hinterland of these colonies both for minerals, but also for marine resources and it is perhaps unsurprising that from the Sixth Century BC we begin to find fish factories located on the Bay of Cadiz. The arrival of Greek colonists in the Peninsula from c600 BC seems to have resulted in the expansion of the commercial axes of the coastal communities with the wide distribution of Mañá-Pascual A4 amphorae pointing to the growth of an important trade in fish sauce at this time.

The attested production sites engaged in this trade seem to have been concentrated in the Phoenician communities of the Bay of Cadiz although their identification has long been difficult due to their close similarity with later Roman

production. The techniques involved appear to have been those described by the Geoponica and there seems to have been considerable continuity between these Punic installations and their Roman successors. This is attested not only by the geographical distribution of fisheries, but also through the patterns of exchange as evidenced by the evolution of Punic Mañá C and PE 41 fish sauce amphorae into Dr 18 and Dr 7-11 forms. In fact Rome's conquest of the Carthaginian colonies of Southern Spain appears to have had little in the way of economic consequences with the Straits of Gibraltar remaining the focus of fish sauce production into the Roman period.

Although Andalusia seems to have developed an important trade and production of fish sauce from an early date there is little evidence with which to date the origins of fish sauce production in Eastern Spain. What local amphora production occurs is principally of forms used in the transport of other products, principally wine - as is true in later periods also - and although fish sauce amphora do appear at a number of sites they reflect the importation of goods from the Phoenician colonies to the South rather than local production. The identification of a number of Greek colonies along the East coast extending from Emporion as far as Mainake in the South has led many to view the region as one of Greek influence, although it is apparent from the widespread influence of Phoenician goods that the coastal areas, at least, were dominated by the produce of the Southern colonies to the extent that by the Fourth Century BC the Iberian communities began to produce pottery in imitation of these forms.

Although the economy of the Peninsula seems to have survived the upheavals of the Second-Third Centuries BC relatively unscathed, it is only with the establishment of a more diffused villa-based economy and the commercial opportunities afforded by the breakdown of Italy's economic importance during the First Century BC that we begin to see important independent production along the East coast. From the Second Century BC we see the establishment of wealthy Romanised farms within Cataluña with the growing investment in the region by members of the Italian aristocracy. The influx of wealth combined with the autarchic principles that dominated Roman production led to the growth of local manufacture, particularly of wine. At first this seems to have remained relatively unimportant with early amphora forms such as Tarraconense 1 and Dr 1 Laietana being of a localised distribution. By the end of the First Century BC,

however, we see the spread of Tarraconensian wine with the identification of locally produced Pascual 1 amphorae over much of the North-Western Mediterranean.

This dramatic increase in Tarraconensian trade - as attested both by Pascual 1 and the succeeding Dr 2-4 forms - may best be explained by the concentration of markets on the Rhine and in the city of Rome during the reign of Augustus with the development of provincial production to meet these demands. Although wine seems to have been the principal product of the region many estates appear to have followed the dictates of Varro and to have engaged in the production of a broader range of commodities. Although secondary to the more developed manufacturing centres of the South coast, the expansion of Tarraconensian wine production from the reign of Augustus is paralleled by the growth of other forms of trade from the region. Thus local producers of fish sauce were now able to exploit the expanding markets gained by Tarraconensian wine with the transport of *garum* as a secondary cargo and as a reciprocal commodity on vessels coming into the area. It is significant that it is at this point that the region sees the earliest production of fish sauce amphorae with the appearance of Dr 7-11 forms.

The connection between the production of fish sauces and of other products from the region is best explained by their inclusion within the economic sphere of *villae*. Although it is possible to speak of 'factory'-based production at a number of sites, particularly in Baetica, the bulk of fisheries along the East Coast seem to have been more scattered and limited in scale, often being found in the immediate proximity of coastal villas. The profitability of these installations, however, led to their operation on an often 'industrial' level beyond that envisaged by the 'primitivist' model of the villa economy. A number of sites such as those at Punta de l'Arenal, La Albufera, Tossal de Manises, Benalúa, Santa Pola, Calpe, Punta del Castell and Rosas appear to have become centres of dependent *vici* - evidently providing employment for a relatively large population throughout the year. The recognition of marine molluscs as well as the close similarities between Columella's salting methods and those employed in the manufacture of fish sauce would suggest that not only did they engage in the salting of fish, but that production of other commodities such as purple dye also took place. Central to the consideration of the economic role of these sites is their

independence and it appears on a number of occasions that these installations were operated as independent units in the hands of bailiffs resident in the immediate vicinity of the factory. As well as economic independence, the fisheries seem to have maintained consistent annual production on a scale sufficient to support a local population as well as dependent industries such as ceramic manufacture as well as salt extraction. Thus although their scale is not necessarily great, these installations do seem to have operated along lines that can be described as 'industrial'.

Some indication of the importance of these factories can also be gained from the evidence of amphorae. Production of these vessels seems to have been concentrated in the hands of a number of *villae* located in relation to towns and other market centres, although as with fisheries there does seem to have been a marked tendency towards some form of concentration if not centralisation with certain locations being more economically viable than others. *Officina* seem, therefore, to have developed, being operated by slaves and freedmen either on behalf of or independently of wealthy landowners. In exceptional circumstances, as in the Bay of Cadiz or the Guadalquivir valley, we can see such a concentration of estate based production that the consequences are markedly 'industrial' in scale. As well as production of amphorae within *villae* and *officinae*, kilns are also attested within the complexes devoted to fish sauce. The range of amphorae forms attested within the levant, however, point to a lack of specialisation and to ceramic production as having been of secondary importance to the wider estate. Even so the appearance of both servile potters, freedmen and landowners on amphorae makes any generalisation problematic.

Even though it is possible to speak of more specialist forms of production, the trading of goods appears to have remained unspecialised with an influx of wealthy landowners such as Lentulus Augur engaging not in the production of one commodity alone but in the autarchic provision of a range of commodities with commercialisation occurring on the whole only when circumstances made it particularly viable - thus the markets achieved by the wine trade were exploited by local fish sauce producers as well. The incidence of dispersed or 'secondary' cargoes from wrecksites such as Port Vendres II suggests that much trade was essentially 'opportunistic' with widely disparate cargoes being loaded and off-loaded as the occasion permitted. Thus it is that

Synesius can concern himself with the arrival of Athenian shoes and Trimalchio boasts of the wide range of goods he traded to garner his fortune.

Although this lack of specialisation may go some way to support the view that the ancients employed an *ad hoc* system of exchange without any concept of the economic unit<sup>3</sup>, the dependent relationship that we see between the *villae*, kilns and fisheries of the East Coast would suggest a greater degree of economic rationalism. Varro's common sense advice to make a profit out of the land that you own need not be taken as evidence that economic motivation is lacking.<sup>4</sup> In a number of cases producers seem also to have engaged in the trading of their goods and a number of wealthy landowners seem to have formed commercial *societates* such as those of the Numisii and Baebii - although it is unclear whether their wealth was a cause or a consequence of their involvement in commerce. Evidently the Lex Claudia served little purpose in keeping Senators from engaging in commercial activities and Xenophon's 'gentleman landowner' may have had more in common with his Eighteenth Century counterpart than he is sometimes given credit.

The exportation of Tarraconensian wine seems to have gone into decline from the end of the First Century AD, perhaps as a consequence of Domitian's attempt to foster that of Italy. With its access to overseas markets now curtailed, Tarraconensian fish sauce production appears to have concentrated upon the satisfaction of local demand with the disappearance of the principal forms of fish sauce amphorae by the mid Second Century and the growing incidence of vessels such as *unguentarii* that were chiefly employed in more localised mechanisms of trade. Often this contraction is seen as a consequence of economic crisis and decline into the Late Imperial period.<sup>5</sup> It is possible that the expansion of wealth in the First Century AD resulted in the increased adlection of families such as the Baebii to the Senate which could boast a powerful Spanish faction by the Second Century AD. This drain of wealth towards the centre of the Empire will have been matched by Italian Senators such as Lentulus Augur, C. Domitius Calvinus and the Mucii Scaevolae buying up estates in the

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<sup>3</sup> cf Finley, M I (1973) The Ancient Economy (Berkeley) p 21.

<sup>4</sup> cf Finley, M I (1973) *op. cit.* n. 3 p 20.

<sup>5</sup> cf Lewit, T (1991) Agricultural Production in the Roman Economy, AD 200-400 BAR Int. Ser. 568 (Oxford) p 1-11.

Peninsula. Adlection to the Senate not only brought about a movement of wealth away from the Peninsula but forced the increasingly onerous *munerae* to fall on a steadily decreasing pool of local aristocrats resulting in the running-down of urban centres - somewhat negated by official investment but not reversed - and an isolation of these from the economic base of the hinterland areas. This is not to say that commerce ceased, rather that it now circumvented these urban centres through patterns of 'tied' trade.

How much this decline is a consequence of competition from North African production is difficult to define as few kiln sites provide us with a continuous record of occupation from the Early to Late Imperial periods. Some survival is likely, however, with Third Century forms such as Keay XVIC representing an evolution of Baetican fish sauce containers of the First-Second Centuries AD. Thus although the production of amphorae continues through the Sixth Century AD, the Almagro 50 and 51c forms attested seem to have been local imitations serving a purely local function whilst African imported wares clearly predominate in the coastal communities. The fisheries themselves seem to have survived the crises of the Third Century with sites such as Punta de l'Arenal continuing as late as the Seventh Century, and even to have been at their most prosperous with the operation of complexes such as those of Rosas and Santa Pola. As with the factories of the early Empire these seem to have been primarily rural in basis forming the focus of *vici* and serving as important *emporium* for exchange in their own right circumventing towns which, beset by increasing economic contraction and the growing difficulty to recover from barbarian depredations, seem to have come to serve less of an economic role and to have survived as only as administrative and ecclesiastical centres.

Fulford has argued that Late Roman/Byzantine rule had a negative effect on the economy of Carthage and it is possible that the Byzantine recovery of Baetica in 552 AD may have had a similar effect on the Iberian economy with a dropping off of commercial activity during the Sixth Century. Byzantine competition may have broken up the patterns of 'tied' trade whilst increased levels of taxation may have drained away the available capital from the region. It is thus perhaps more feasible to speak of a change of focus than economic contraction in the Late Imperial economy.

Fish sauce production, thus seems to have remained an economic staple of the region throughout the period covered by this thesis, and it is erroneous to ascribe its cessation purely to economic decline. Production seems to have achieved a scale and independence at which the epithet of being 'industrial' is not misplaced and one should beware of regarding 'gentlemanly' pursuits as exclusive of economic criteria. Fish sauce production provided a reliable and profitable source of revenue dominating much of the coastal economy, although remaining of a secondary nature to other ventures such as wine production and its widespread trade only became possible with the combination of possibilities afforded by the economic climate of the First Century AD. It may well be a misinterpretation to speak, therefore, of an economic decline from this point. Despite the political disturbances that took place, the economy of Tarraconensis remains remarkably stable and the expansion that took place during the First Century AD may have been more of an aberration than a sign of the province's wider economic importance.

Economic conclusions are always tendentious and perhaps, as with much economic analysis, Sir Moses Finley's complaint holds true:

*The economic language and concepts we are all familiar with... the models we employ, tend to draw us into a false account.... we have I suggest, to seek different concepts and different models, appropriate to the ancient economy, not (or not necessarily) to ours.<sup>6</sup>*

For much of the ancient economy was dictated by social rather than economic criteria than would be permissible today and in this, perhaps fish sauce is no exception. Thus although distinctions are difficult and at best vague, some such economy and industry can be adjudged to have functioned within the gentlemanly agriculture of ancient Tarraconensis.

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<sup>6</sup> cf Finley, M I (1973) op. cit. n. 3 p 23, 27; quoted by Lewit, T (1991) op. cit. n. 5 p 4.

# APPENDIX

## ANCILLARY INDUSTRIES: SALTING AND THE PRODUCTION OF PURPLE DYE

An important adjunct to the production of salt fish is the preparation of salt and of purple dye. As we have seen, proximity to adequate salt resources was a central factor in the development of installations devoted to the manufacture of salt fish whilst the functioning of these sites as economic units will have been facilitated by their use in manufacture of purple dye and related products. Although not strictly within the remit of fish sauces, it is to these associated processes that we must now turn.

### 1. THE FUNCTION OF SALT IN THE ANCIENT ECONOMY

Salt is the most important ingredient in the production of salt fish and its related fish sauces, being used in relative quantities at a ratio of 1:8 to that of fish. Yet salt was not only important for its role in the production of salted fish and I would now like to turn attention to the position of salt in the ancient economy. Despite its multifarious uses the economic importance of salt has been largely ignored by ancient historians, an omission I believe, that overlooks the great importance of this industry in the ancient world. One does not have to look far to ascertain the reasons for this failing; namely the lack of archaeological evidence pertaining to the production of salt. The raw product itself leaves no traces in the archaeological record making it impossible, unless we have the advantage of the briquetage finds of NW Europe (something about which more shall be said later), to trace the patterns in its commerce and exchange. Production sites too, often consisting of insubstantial remains of flat salt pans are difficult to detect or, in the best of cases, to date without the existence of more substantial associated archaeological features. Furthermore the bulk of ancient salt production is located in coastal areas where erosion and changes in water levels have brought about not only the destruction of these remains, but also has hidden them from the eyes of the archaeologist. Much stress, therefore, has centred upon the use of ancient literary evidence for the Graeco-Roman salt industry. This, however, is a technique fraught

with potential inaccuracies and unable to provide any valid quantitative evidence for the role of salt in the economy. Salt in its own right was an object of no importance to the standard ancient literary texts and is included only as a curio or as a circumstantial detail to a wider historical event. Despite this, I believe that by a judicious use of the, albeit very limited, archaeological and literary evidence it is possible to gain a tentative picture of the ancient salt industry. Focus must, therefore, move away from the Iberian Peninsula and take in evidence from elsewhere within Western Europe, and I hope that some allowance will be made for this. Firstly, therefore, I shall devote attention to the importance of salt in the ancient world and the range of multifarious uses that were made of it. We shall then turn to the sources that were utilised for its production and finally to attempt ascertain the economic relationship between salt and fish sauce production.

*Ergo, Hercules, vita humanior sine sale non quit degere, adeoque necessarium elementum est uti transierit intellectus ad voluptates animi quoque nimias.*<sup>1</sup> Thus does the Elder Pliny underline the importance of salt, a view that is reiterated by Cassiodorus: *Poteste aurum aliquis minus quaevere, nemo est qui salem non desideret invenire.*<sup>2</sup> In fact from the earliest periods of history Man seems to have realised the importance of salt as a feature of diet. With the introduction of more settled dietary patterns, principally the increased consumption of grain, during the Neolithic we see the first exploitation of natural salt resources, as the predominately carnivorous diet of the hunter-gatherers was replaced by a more agrarian based diet, which both necessitated the use of salt as a dietary supplement but also brought about its use as a preservative as the more established settlement patterns enabled the storage of food in the longer term. Such was the widespread use and importance of salt that we see the establishment of settlement sites in relation to sources of salt supply and we see the establishment of a number of wealthy sites and cultures based upon their control of the production and exportation of salt. The most notable example of this can be seen in the salt springs of

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<sup>1</sup>Pliny *NH* 31.41.88: "Therefore, Heaven knows, a civilised life is impossible without salt, and so necessary is this basic substance that its name is applied metaphorically to intense mental pleasures." (trans. Loeb ed.).

<sup>2</sup>Cassiodorus *Variarum* 12.24.6: "Some one may be less amorous to seek out gold, but no one does not want to find salt." Catullus comments that his own poems must have *salem et leporem* (16.7: salt and charm) whilst a rival of Lesbia's has *nulla mica salis* (86.4: not a grain of salt).

the Hallstatt-Hallein which seem to have begun to be exploited around this time and an important factor behind the subsequent prosperity of these sites during the Hallstatt-La Tene periods may well have been their control of the salt trade with trading connections running from the Northern Adriatic to the Moldau and Elbe, and along the Rhine-Rhone valleys to the Danube.<sup>3</sup>

The importance of salt to the prosperity of the early city-state of Rome is oft-cited and an attempt has been made to see her expansion within Italy in terms of her acquisition of salt supplies.<sup>4</sup> According to Livy control of salt pans at the mouth of the Tiber was one of the principal factors behind the establishment of Ostia<sup>5</sup>, this encouragement of the salt industry being ascribed to the reign of Ancus Marcius.<sup>6</sup> Similarly, the early development of the Via Salaria enabled Rome to control the exchange of salt between Etruria and Latium. The salt-pans of Ostia seem, however, to have been quickly superseded by the more important ones located across the Tiber from Rome, at Fidenae. These lay within the territory of Veii and go some way to explaining the wealth of the Etruscan city and the causes of her conflict with Rome. The creation of the Claudian and Crustumian tribes deprived Fidenae of much of her land and enabled Rome to place a stranglehold over Veii's salt trade with the interior. The defeat of the latter in 396 BC not only shifted the economic focus of the region to Rome but also gave Rome access to the salt pans that provided a valuable source of revenue. Even in later periods the importance of controlling such supplies of salt can be seen in the recorded instances of conflict arising from the possession of salt pans: Tacitus describes a battle between the Hermunduri and Chatti over the possession of a salt

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<sup>3</sup>On the role of Salt in the wealth of Halstatt sites, cf Nenquin, J (1961) *Salt: a study in economic prehistory* (Brugge) p 148-152, and Hopkinson, B (1975) "Archaeological evidence of Saltmoulding at important European salt-sites and its relationship to the distributions of Urnfielders" in *JIES* 3.1 p 1-52. cf also Cunliffe, B (1988) *Greeks, Romans and Barbarians* (London) for a more recent discussion of trading connections during the Halstatt and La Tene periods.

<sup>4</sup>cf Giovannini, A (1985) "Le Sel et la Fortune de Rome" in *Athenaeum* 63 p 373-387. On the importance of salt to early Rome, cf Holland, L A (1949) "The Forerunners and rivals of the Primitive Roman Bridge" in *TAPA* 80 p 281-319.

<sup>5</sup>Livy *History* 1.33.9: *et in ore Tiberis Ostia urbs condita, salinae circa factae* "at the Tiber's mouth the city of Ostia was founded and salt works established nearby". (trans. Loeb ed.).

<sup>6</sup>Pliny *NH* 31.41.89: *Ancus Marcius rex salis modios VI in congruario dedit populis et salinas primus instituit* "King Ancus Marcius gave a largesse to the people of 6000 bushels of salt, and was the first to construct salt-pans". (trans. Loeb ed.).

river<sup>7</sup>, a similar conflict to which is ascribed by Ammianus Marcellinus to the reign of Valentinian I.<sup>8</sup>

The origins of salt production within the Iberian Peninsula are unclear, although it seems reasonable to suggest an early date as found elsewhere. The region itself is rich in salt supplies possessing ideal climatological and ecological conditions for its acquisition. The establishment of sites with an agricultural, and possibly a piscatorial base during the Neolithic, for example, the establishment of a series of sites in the area of Sierra Alhamilla-Campo de Nijar (Almería)<sup>9</sup> will suggest the exploitation of salt to meet the requirements of these communities, both in terms of agricultural usage, diet and also possibly for use in the preservation of food. Julio Mangas and M<sup>a</sup> Rosario Hernando have argued that there already existed extensive networks of the salt trade within the Peninsula dating back to the Iberian period.<sup>10</sup> The widespread incidence of specific artefact types across a range of Castro sites (for example, the 'cuadrillas' of La Mancha, Burgos, Soria and Pierahita) are cited as pointing to the existence of commercial contacts and the shipment of salt from points of supply to those of demand. Political relationships appear to have existed between different Iberian tribal groups: the Carpetanii, Celtiberii, Vettonii and Vaccei at the time of Hasdrubal's invasion of the interior in 220 BC, as well as during the Roman conquest of the Tagus valley in the Second Century BC; and it is possible that the origins of these lay in commercial links based upon the exchange of salt. To follow this argument of Mangas and Hernando would, however, be putting too much stress upon the economic importance of salt to

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<sup>7</sup>Tacitus *Annals* 13.57: *Eadem aestate inter Hermunduros Chattosque certatum magno proelio, dum flumen gignendo sale fecundum et conterminum vi trahunt.* "In the same summer, a great battle was waged between the Hermunduri and Chatti, both attempting to appropriate by force a river which was at once a rich source for salt and the frontier line between the tribes." (trans. Loeb ed.).

<sup>8</sup>Ammianus Marcellinus 28.5.11: "The Emperor's letters were gladly received for two reasons: first, because the Burgundians know that they are descendants of Romans from ancient times; and then, since they frequently quarrelled with the Alamanni about salt pits and boundaries." (trans. Loeb ed.).

<sup>9</sup>El Barranquete. El Tarajal. Los Escullos and La Isleta; although the primary economic basis of these sites would appear to be the exploitation of copper, the establishment of settlement within the Sierra Alhamilla is followed by that of subsidiary settlements within the coastal Campo de Nijar, which would appear to have an economic basis of agriculture and fishing, cf Gusi i Jener, F and Olaria i Puyoles, C (1991) *El Poblado Neoceneolítico de Terrera-Ventura (Tabernas, Almería)* (Excavaciones Arqueológicas en España 160, Madrid).

<sup>10</sup>cf Mangas, J and Rosario Hernando, M<sup>a</sup> (1990) "La Sal y las relaciones intercomunitarias en la Península Ibérica durante la Antigüedad" in *MHA* 11-12 p219-231.

the exclusion of a number of equally permissive causes<sup>11</sup>; political expediency will no doubt have played an important part in arranging the tribes against the Carthaginian and Roman forces, whilst the variability of motivations and fragility of such alliances involving the Iberian tribes is clear from even the most cursory analysis of the history of the Iberian Peninsula during the second half of the First Millennium BC. Certainly trade will have existed between regions rich in salt, principally those of the coast, and the more isolated sites of the interior and it is probable that some salt at least was included in this, however, as later periods show, the wealth of salt found across the Peninsula as a whole has acted as a deterrent against the growth of long distance trade-routes as have been found elsewhere. A number of Iberian communities; for example, Peñon d'Ifach (Calpe), Santa Pola, Tossal de Manises, Loma del Escorial (Los Nietos, Cartagena); are located in relation to sources of salt and to the sites of later salt fish factories and it is possible that these sites owed their economic survival to the exploitation of these same salt resources. Morère's study of salt production within the region of Sigüenza has suggested a correlation between prehistoric settlement sites and sources of salt<sup>12</sup>: the necropoleis of Prados Redondos (Alcuneza), Carabias and Riotovi del Valle are located near to remains of salt-pans, and although such cannot be proven it is possible that the establishment of communities in these locations owes much to the exploitation of salt.<sup>13</sup>

The Graeco-Phoenician colonisation of the Western Mediterranean is conventionally ascribed to the acquisition of mineral resources, particularly in the light of their opening of contacts with the metal rich regions of Etruria and Turdetania. Whether or not salt was included within this is open to debate; the development of the fish salting industry by the Phoenician colonists will have necessitated the existence of salt production. The latter region, at least, is praised by Strabo for its wealth of salt

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<sup>11</sup>For example, the exploitation of copper formed the basis for the establishment of the Grupo Cultural de Los Millares (Almería) during the Neolithic, cf Gusi i Jener, F and Olaria i Puyoles, C (1991) op. cit. n. 9.

<sup>12</sup>cf Morère, N (1991) "L'exploitation romaine du sel dans la region de Sigüenza" in Alimenta. Homenaje al Dr Michel Ponsich (Anejos de Gerion 3) p 223-235. I regret that at the time of writing I was unable to cite the excavation reports of the sites listed by Morère as being located in relation to salt supplies.

<sup>13</sup>Schulten, A (1959) Geografía y etnografía antiguas de la Peninsula Ibérica (Madrid) has argued that the exploitation of salt was unknown to the Iberian communities of the Meseta; once again, I regret that I have not been able to cite this source directly.

amongst its other produce.<sup>14</sup> It has been suggested that access to supplies of salt was a major factor behind the siting of the Greek colonies of Southern France, with it forming one of the main resources exchanged between the indigenous peoples and the colonists.<sup>15</sup> Strabo tells us that the Gaditanians traded pottery, salt and copper artefacts with the Cassiterides.<sup>16</sup> By the Colonising period, therefore, we see that there will have existed an established production and exchange of salt within the coastal areas of the Iberian Peninsula; how far this extended inland and the date at which we can place the earliest utilisation of such resources are unclear, although the archaeological evidence would make it reasonable to assume an early date in the Neolithic period.

The literary sources tell us little that is specific about the production of salt within the Peninsula during the Classical period; usually they speak in terms of the wealth of the Peninsula as a whole, although a number of regions do get singled out for comment. Strabo refers to the wealth of salt mines and salt rivers to be found within Turdetania which he links to the large fish salting industry along the coast of the Straits of Gibraltar.<sup>17</sup> Sidonius tells us of salt mining somewhere within the region of Tarraconensis although precisely where he is referring to is a matter of some debate.<sup>18</sup>

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<sup>14</sup>Strabo 3.2.6.

<sup>15</sup>cf Benoit, F (1959) "L'Économie du littoral de la Narbonnaise à l'Époque Antique: le commerce du sel et les pêcheries" *RSL* 15 p 87-110.

<sup>16</sup>Strabo 3.5.11: μεταλλά δὲ ἔχοντες κατιτέρου καὶ μολύβδου κέραμον ἀντὶ τούτων καὶ τῶν δερμάτων διαλλάττονται καὶ ἄλας καὶ χαλκῶματα πρὸς τοὺς ἐμπόριαν ἕστελλον ταύτην ἐκ τῶν Γαδεΐρων, κρύπτοντες ἅπασιν τὸν πλοῦν [The Cassiterides] "As they have mines of tin and lead, they give these metals and the hides from their cattle to the sea-traders in exchange for pottery, salt and copper utensils. Now in former times it was the Phoenicians alone who carried on this commerce (that is, from Gades), for they kept the voyage hidden from everyone else." (trans. Loeb. ed.).

<sup>17</sup>Strabo 3.2.6: Ἐξάγεται δ' ἐκ τῆς Τουρθητανίας σιτός τε καὶ οἶνος πολὺς καὶ ἔλαιον οὐ πολὺ μόνον, ἀλλὰ καὶ κάλλιστον· καὶ κηρὸς δὲ καὶ μέλι καὶ πίττα ἐξάλεται καὶ κόκκος πολλῆ καὶ μύλος οὐ χεῖρων τῆς Σινωπικῆς γῆς τὰ τε ναυπήγια συνιστάσιν αὐτόθι ἐξ ἐπιχωρίας ὕλης, ἄλες τε ὄρυκτοὶ παρ' αὐτοῖς εἰσι καὶ ποταμῶν ἄλμυρῶν ρεύματα οὐκ ὀλίγα, οὐκ ὀλίγη δὲ οὐδέ ἐκ τῶν ὄψων ταριχεῖα οὐκ ἔνθεν μόνον, ἀλλὰ καὶ ἐκ τῆς ἄλλης τῆς ἐκτὸς Στηλῶν παραλίας, οὐ χείρων τῆς Ποντικῆς. "There are exported from Turdetania large quantities of grain and wine, and also olive oil, not only in large quantities, but also of best quality. And further, wax, honey, and pitch are exported from here, and large quantities of kermes, and ruddle which is not inferior to the Sinopean earth. And they build their ships there out of native timber; and they have salt quarries in their country, and not a few streams of salt water; and not unimportant, either, is the fish salting industry that is carried on, not only from this country, but also from the rest of the seaboard outside the Pillars; and the product is not inferior to that of the Pontus." (trans. Loeb ed.).

<sup>18</sup>Sidonius *Ep.* 9.12.1: "There has come into my hands a letter from you which bears much likeness to Spanish salt cut on the hills of Tarraconensis; for the reader finds it luminous and salty; but not the less honeyed on that account." Morère, N (1991) *op cit.* n. 12 p 229, believes that this specifically refers to the Ager Tarraconensis, however, Sidonius does not appear to be making any such definition

Aulus Gellius makes a passing reference to the existence of a large salt mountain near the R. Ebro<sup>19</sup>, whilst the Elder Pliny praises the salt mined from Egelasta that lay to the NW of Carthago Nova.<sup>20</sup> Unfortunately archaeological evidence in support of these references is lacking. In the Present day, however, mineral salt is found over much of the Peninsula and it is unlikely that it was not similarly exploited during the Roman period. The most important sources lie in the province of Santander, where the mines of Palanco and Cabezón de la Sal have primacy. Other important producing areas include Malá (Granada), Peal de Becerro and Siles (Jaén) and Yecla (Murcia). Schulten has proposed that the salt mountain referred to by Aulus Gellius, is in fact that of Cardona (Barcelona).<sup>21</sup> A number of important Roman sites, such as Medinaceli (Soria) are now located in areas noted for their salt mines and although I would not like to push this point, such considerations may well have been factors behind the prosperity of these towns in the Roman period.<sup>22</sup> Toponymy might also be of assistance in identifying settlements associated with salt: Ptolemaeus cites three towns with the name 'salaria'; in Oretania (2.6.58), in Bastetania (2.6.60) and in Baetica (2.4.9). A number of names survive to this day which allude to an abundance of salt, for example, Poza de la Sal (Burgos), Alhama de Salmerón (Almería) and so forth.

## 2. USAGE AND REQUIREMENTS OF SALT

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and it is unclear whether or not he is referring to Tarraco or to the province as a whole, although if the latter the use of Citeriore would be a more expected title.

<sup>19</sup>Aulus Gellius 2.22.28-9: "For writing about the Spaniards who dwell on this side of the Ebro, he [Cato] set down these words: 'But in this district are the finest iron and silver mines, also a great mountain of pure salt; the more you take from it the more it grows'." (trans. Loeb ed.).

<sup>20</sup>Pliny *NH* 31.39.80: *in Hispania quoque citeriore Egelesta caeditur glaebis paene transhicientibus cui iam pridem palma a plerisque medicis iter omnia salis genera perhibetur.* "In Hither Spain too at Egelasta salt is cut into almost transparent blocks; to this for some time past most physicians have given the first place among all kinds of salt." (trans. Loeb ed.).

<sup>21</sup>Aulus Gellius 2.22.28-9; cf Schulten. A and Bosch-Gimpera, P (1922) *Fontes Hispaniae Antiquae* (Barcelona).

<sup>22</sup>Other major modern salt producing areas include Forcada, La Rica de Hoz, Peralta de la Sal and Naval (Huesca); Gerri de la Sal (Lérida); Remolinos (Zaragoza); Guerdelain and Tirapu (Navarra); Medinaceli (Soria); Tierzo, Rienda, Cercadillo, Paredes and Imon (Guadalajara); Belinchón, Manzano, Monteadó, Val-Salobre and Muglanilla (Cuenca); Ciempozuelos (Madrid); Hellín and Ayna (Albacete); Laguna de Salinas, Villena-Pinoso (Alicante); Ibiza and Formentera (Balearics); Gonzalo Tarín (Granada). On salt production in modern Spain, cf Martín-Echeverría, L (1937) *Geografía de España* (Barcelona) and (1940) *España. El País y los Habitantes* (Mexico, Editorial Atlante SA); Cortada Reus, F (1946) *Geografía Económica de España* (Barcelona); Way, R (1962) *A Geography of Spain and Portugal* (London).

The importance of salt lay in her ubiquity and multifarious uses, not only as an aspect of diet but also, in a period prior to refrigeration, as the principal method of food preservation. Salt is an essential feature of the human diet and its role as such is amply attested in the ancient literary evidence: the Elder Pliny says that it was used in the seasoning of meats<sup>23</sup> and quotes Varro as saying that in earlier periods salt was used as a relish.<sup>24</sup> Dio Chrysostom's description of an Euboean farm includes reference to the keeping of salted and smoked meat, the latter of which is inferior to the former.<sup>25</sup> Cato includes salt within his guidelines of food to give his slaves.<sup>26</sup> Such was the value attached to sea salt that Synesius could express amazement at his Cyrenaican neighbours for not using salt with their food.<sup>27</sup> As well as that directly applied to food as a relish and supplement to the diet, much of the required salt intake was satisfied by the consumption of salted meats. Before the advent of alternative methods of food preservation the principal technique was that of salting, both of meats but also of other types of food as well. The most complete description of the method of salting meat is given by Cato and is worth quoting here in full:

<sup>23</sup>Pliny NH 31.41.87: *ad opsonium et cibum utilior quisquis facile liquescit, item umidior, minorem enim amaritudinem habent, ut Atticus et Euboicus.* "To season meats and foods the most useful one melts easily and is rather moist, for it is less bitter, such as that of Attica and Euboea." (trans. Loeb ed.).

<sup>24</sup>Pliny NH 31.41.89: *Varro etiam pulmentarii vice usos veteres auctor est, et salem cum pane esitasse eos proverbio apparet.* "Varro too is our authority that the men of old used salt as a relish, and that they ate salt with their bread is clear from a proverb."

<sup>25</sup>Dio Chrysostom Discourses 7.44: Οὐχ ἴσταμεν τὰ κρέα ἡμεῖς ἃ δ' ἄν π δίδομεν. ἔστι δὲ ὀλίγα ἐν ἄλσι, τὰλλα δ' ἐν τῷ καπνῷ ξηρά, οὐ πολὺ ἐκείνων χεῖρεε, σκελίδες ὄων καὶ ἐλάφιοι καὶ ἄλλα γενναῖα κρέα. "We do not weigh our meat, but we will give whatever we have. There is a little salted down, but the rest is smoked and not much inferior to the other. There are sides of bacon and venison and other excellent meats." (trans. Loeb ed.).

<sup>26</sup>Cato On Agriculture 58: *Pulmentarium familiae. Oleae caducae quam plurimum condito. Postea oleas tempestivas, unde minimum olei fieri poterit, eas condito, parcito, uti quam diutissime durent. Ubi oleae comesae erunt, hallecem et acetum dato. Oleum dato in menses unicuique S.I.; salis unicuique in anno modium satis est.* "Relish for the hands: store all the windfall olives you can, and later the mature olives which will yield very little oil. Issue them sparingly and make them last as long as possible. When they are used up, issue fish pickle and vinegar, and a pint of oil a month per person. A modius of salt a year is sufficient."

<sup>27</sup>Synesius Ep. 148: "I have moved up country to the southern extremity of Cyrenaica, and my neighbours are such men as Odysseus was in quest of, when he steered from Ithaca to appease the wrath of Poseidon, in obedience to the oracle:

Men who know not the sea,  
Nor eat food mixed with salt.

But do not think that I am exaggerating when I say that people here do not take to the sea, even for the purpose of getting their salt, nor yet suppose that thus they eat their meat unsalted. We have, I swear by holy Vesta, at a distance to the south less than that which separates us from the sea to the North, a native salt which comes from the earth and which we call Hammon's salt."

<Salsuram pernarum et ofellae puteolanae> Pernas salire sic oportet in dolio in seria: cum pernas emeris, ungulas earum praecidito. salis romaniensis moliti in singulas semodios. in fundo dolii aut seriae sale sternito: deinde pername ponito, cutis deo sum spectet, sale obruito totam. deinde alteram insuper ponito: eodem modo obruito, caueto ne caro carnem tangat. ita omnes obruito. ubi iam amnes composueris, sale insuper obrue, ne caro appareat: aequale facito. ubi iam dies quinque in sale fuerint, eximito omnis cum suo sale: quae tum summae fuerint, imas facito eodemque modo obruito et componito. post dies omnino XII pernas eximito et salem omnem detergeto et suspendito in uento biduum; die tertio extergito spongea bene, perunguito oleo, suspendito in fumo biduo. tertio die demito, perunguito oleo et aceto commixto, suspendito in carnario: nec tinia nec uermes tangent.<sup>28</sup>

Although, as we have mentioned earlier, the term *Salsamentum* was most widely used to refer to salted fish, it also applied to all forms of salted meat. Even though the sources tell us little of the nature and production of salted meat, its use must have been commonplace and its production seems closely to have paralleled that of fish sauces, although whether or not salted meat as well as salted fish was produced in the coastal fish salting installations is still unclear. From the Cato passage quoted above we see that the meat was placed in a jar, presumably a *dolia*, with alternate layers of salt. As with fish sauces the prime concern was the achievement of a sufficient salinity with Cato specifying that after five days the meat should be turned to ensure that the salt

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<sup>28</sup>Cato *On Agriculture* 162: "Method of curing hams and Puteolan ofella. You should salt hams in the following manner, in a jar or large pot: When you have brought the hams cut off the hocks. Allow a half modius of ground Roman salt to each ham. Spread salt on the bottom of the jar or pot; then lay a ham, with the skin facing downwards, and cover the whole with salt. Place another ham over it and cover in the same way, taking care that meat does not touch meat. Continue in the same way until all are covered. When you have arranged them all, spread salt above so that the meat shall not show, and level the whole. When they have remained five days in the salt remove them all with their own salt. Place at the bottom those which had been on top before, covering them and arranging them as before. Twelve days later take them out finally, brush off all the salt, and hang them for two days in a draught. On the third day clean them thoroughly with a sponge and rub with oil. Hang them in smoke for two days, and the third take them down, rub with a mixture of oil and vinegar, and hang in the meat-house. No moths or worms will touch them." (trans. Loeb ed.).

permeated through all levels of the jar. Cato appears to be describing a method of mild curing by which the meat is immersed either in a low level of salt or in levels of higher salinity but for only a short period of time, after which the meat is smoked or cured. The end result is a meat that is only partly dried and which keeps for little longer than the fresh equivalent. Hard curing entails the use of higher quantities of salt and results in a very salty meat which has a better preservation than the method of mild curing that is given by Cato.

Brining in the manner of salted fish and sauces is a more rapid method of preserving meat. A high level of salt is required and as the meat absorbs the salt from the surrounding brine further quantities need to be added on a regular basis. This technique closely parallels that used with relation to fish and, as has been discussed earlier, is described by Columella:

*est et alia salsura, quae etiam locis calidis omni tempore anni potest usurpari. cum ab aqua pridie sues prohibitae sunt, postero die mactantur, et vel aqua candente, vel ex tenuibus lignis flammula facta glabrantur, nam utroque modo pili detrahuntur caro in libraria frusta conciditur: deinde in seria substernitur sal coctus, sed modice ut supra diximus infractus: deinde offulae carnis spisse componuntur, et alternis sal ingeritur. sed cum ad fauces seriae perventum est, sale reliqua pars repletur, et impositis ponderibus in vas comprimitur: eaque caro semper conservatur, et tanquam salsamentum in muria sua permanet.<sup>29</sup>*

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<sup>29</sup>Columella *Re Rustica* 12.55.4: "And there is another salting method which can even be used in hot places at every season of the year. When the pigs have been prohibited from water for a day, on the next day they are slaughtered and are deprived of hair either with boiling water or with a small flame made from slender pieces of wood, for in each way the hairs are removed. The flesh is cut into pieces of a pound each. Parched salt, but moderately broken as we have said above, is laid down in large containers. The small pieces of meat are thickly arranged, and salt is placed on alternately. But when the throat of the jars has been reached, the remaining part is filled with salt and with weights placed on top is pressed down into the containers. And this flesh is always preserved, just as salt-fish is preserved in its own liquid." (trans. Curtis, R I (1991) p 10).

As with the recipe given by Cato the determining factor is the maintenance of a high level of salinity, reaching 70% in the case of brining.<sup>30</sup> Such quantities of salt will have been required to enable the shipment and preservation of food for periods of any length and it is probable that, despite its saltiness and undesirability compared to more mildly cured meats, hard curing will have been widespread. We hear mention within the literary sources of a number of areas that were noted for their export of salted meat, principally Gaul: Strabo praises a number of tribes and regions for shipping salted pork to Rome during the First Century BC.<sup>31</sup> Parts of Italy and Greece also receive comment for their salting of meat.<sup>32</sup>

Yet salting was not confined merely to the preservation of meats; we find in Cato and Columella a number of further uses for the salting of food. Cato specifies the amounts of salt to be used to produce a brine suitable for the salting of meat, fish and cheese.<sup>33</sup> Salt is also used to preserve olives.<sup>34</sup> Columella describes the preservation of

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<sup>30</sup>cf Curtis, R I (1991) *Garum and Salsamenta: Production and Commerce in Materia Medica* (Leiden) p 19.

<sup>31</sup>Strabo *Geography* 4.3.2: ἄλλος δ' ἐστίν, ὁμοίως ἐν ταῖς Ἀλπεσι τὰς πηγὰς ἔχων, Σηκοάνας ὄνομα. ρεῖ δ' εἰς τὸν ὠκεανόν, παράλληλος τῷ Ῥήνῳ, διὰ ἔθνοους ὁμωνύμου, συνάπτοντος τῷ Ῥήνῳ τὰ πρὸς εἶω, τὰ δ' εἰς τὰναντία τῷ Ἀραρί, ὅθεν αἱ κάλλισται ταριχεῖαι τῶν ὑείων κρεῶν εἰς τῆν Ῥώμην κατακομίζονται. "and there is still another river, Sequana by name, which likewise has its sources in the Alps. It flows into the ocean, however, running parallel to the Rhene, through a tribe of like name, which country joins the Rhene in its eastern parts, but in the opposite parts, the Arar: and it is from their country that the finest salted hog-meat is brought down and shipped to Rome." cf also, 4.4.3: τροφή δὲ πλείστη μετὰ γάλακτος καὶ κρεῶν παντοίων, μάλιστα δὲ τῶν ὑείων καὶ νέων καὶ ἀλιστῶν.....οὕτως δ' ἐστὶ δαμιλίμῃ καὶ τὰ ποιμνία καὶ ὑοφόρβια, ὥστε τῶν σάγων καὶ τῆς ταριχεῖας ἀφθονίαν μὴ τῷ Ῥώμῳ χορηγεῖσθαι μόνον, ἀλλὰ καὶ τοῖς πλείστοις μέρεσι τῆς Ἰταλίας. [The Belgae] "Food they have in great quantities, along with milk and flesh of all sorts, but particularly the flesh of hogs, both fresh and salted.....And their flocks of sheep and herds of swine are so very large that they supply an abundance of the 'sagi' and the salt-meat, not only to Rome, but to most parts of Italy as well." (trans. Loeb ed.).

<sup>32</sup>Italy: Varro *De Re Rustica* 2.4.11: "With regard to the size of Gallic fitches, Cato uses this language: The Insubrians in Italy salt down three and four thousand fitches." Greece: Pliny *NH* 31.41.87: *servandis carnis aptior acer et siccus, ut Megaricus*. "For preserving meat the more suitable salt is sharp and dry, like that of Megara." (trans. Loeb ed.). For the preservation of meats with salt, cf also Dioscorides 2.29, 2.33.

<sup>33</sup>Cato *On Agriculture* 88. "Recipe for bleaching salt: Break off the neck of a clean amphora, fill with clear water, and place in the sun. Suspend it in a basket filled with common salt and shake and renew from time to time. Do this daily several times a day until the salt ceases to dissolve for two days. You can find when it is saturated by this test: place a small dried fish or an egg in it, and if it floats you have a brine strong enough to pickle meat or cheese or salted fish. Place this brine in flat vessels or in pans and expose it to the sun. Keep it in the sun until it solidifies, and you will have a pure salt. In cloudy weather or at night put it under cover, but expose it to the sun every day when there is sunshine." (trans. Loeb ed.).

<sup>34</sup>Cato *On Agriculture* 7.4: *pira uolaema, aniciana et sementiua (haec conditiua in sapa bona erunt), tarentina, mustea, curcurbitiua, item alia genera quam plurima poteris serito aut inserito. oleas*

various types of vegetables, lettuce, apples, onions, pears and other fruits entailing the use of a brine solution composed of two thirds vinegar and one third hard brine.<sup>35</sup> The

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*orchites, posias: eae optime conduntur uel uirides in muria uel in lentisco contusae; uel orchites, ubi nigrae erunt et siccae, sale confriato dies V: postea salem excutito, in sole ponito biduum, uel sine sale in defrutum condito. sorua in sapa condere uel siccare: arida facias; item pira facias. cf also 117: Oleae albae quo modo condiantur. ante quam nigrae fiant, contundantur et in aquam deiciantur: crebro aquam mutet. deinde, ubi satis maceratae erunt, exprimat et in acetum coiciat et oleum addat, salis selibram in modium olearum. foeniculum et lentiscum seorsum condat in acetum. si una admiscere uoles, cito utitor. in orculam calcato. manibus siccis, cum uti uoles, sumito.*

<sup>35</sup>Columella *De Re Rustica* 12.7: *His praeparatis circa vernum aequinoctium herbas is usum colligi et reponi oportebit, cymam, caulem, capparim, apii coliculos, rutam, holeris atri cum suo cole florem antequam de folliculo exeat: item ferulae cum coliculo silentem florem: pastinacae agrestis vel sativae cum coliculo silentem florem: vitis albae et asparagi et rusci et tamni et digitelli et puleii et nepetae et lapsanae et battis et eius coliculum, qui milvinus pes appellatur; quin etiam tenerum coliculum faeniculi Haec omnia una conditura commode servantur, id est aceti duas partes, et tertiam durae muriae si miscueris. Sed vitis alba, ruscus, et tamnum et asparagus et pastinaca et nepeta et battis generatim in alveos componuntur, et sale conspersa biduo sub umbra, dum consudent, reponuntur: deinde si tantum remiserint humoris, ut suo sibi iure abluui possint: si minus, superfusa dura muria lavantur, et pondere imposito exprimuntur: tum suo quidque vase conditur, et ius, ut supra dixi, quod est mixtum duabus partibus aceti et una muriae, infunditur, faeniculique aridi, quod est per vindemiam proximo anno lectum, spissamentum imponitur, ita ut herbas deprimat, et ius usque in summum labrum fideliae perveniat.*

*Olusatrum et ferulam et faeniculum cum legeris, sub tecto exponito, dum flaccescat: deinde folia et corticem omnem coliculorum detrahit. Caules si fuerint pollice crassiores, harundine secato, et in duas partes dividito. Ipsos quoque flores, ne sint immodici, diduci et partiri oportebit, atque ita in vasa condi. Deinde eius, quod supra scriptum est, infundi, et paucas radículas laseris, quod Graeci σιλφιον vocant, adici, tum spissamento faeniculi aridi contegi, ut ius superveniat. Cymam, caulem, capparim, pedem milvi, puleium, digitellum, compluribus diebus sub tecto siccari, dum flaccescat, et tum eodem modo condiri convenit. quo ferulam, rutam, satureiam, cunilam. Sunt qui rutam muria tantum dura sine aceto condiant, deinde, cum usus exigit, aqua vel etiam vino abluant, et superfuso oleo utantur. Haec conditura possit commode satureis viridis, et aequae viridis cunila servari.* "When vinegar and brine have been got ready about the time of the spring equinox it will be necessary to collect herbs and store them up for use, namely, sprouts and stalks of cabbage, capers, stalks of parsley, rue, the flower of alexanders with its stalk before it comes out of its sheath, also the unopened flower of the giant fennel with its stalk, and the unopened flower of the wild or the cultivated parsnip with its stalk, the flower of the bryony, asparagus, butcher's-broom, white vine, house-leek, fleabane, cat-mint, charlock, and samphire and its little stalk, which is called 'Kite's foot', also the tender little stalk of the fennel. All these are conveniently preserved by one method of pickling, that is to say, a mixture of two-thirds of vinegar and one-third of hard brine. But bryony, butcher's broom, white vine, asparagus, parsnip, catmint and samphire are also placed according to their kind on trays, and having been sprinkled with salt are placed for two days in the shade until they yield up their moisture; then if they have produced enough liquid to enable them to be washed in their own juice, well and good; but if not, they are washed by having hard brine poured over them and have the liquid squeezed out of them by having a weight placed over them. Then each is stored in its own vessel, as I have said above, and a fluid which is a mixture of two parts of vinegar and one of brine is poured on it, and a stopper of dry fennel, which was picked during the vintage in the previous year, is inserted so as to press down the herbs and make the liquid come up to the brim of the jar.

When you have picked alexanders and giant-fennel and ordinary fennel, lay them out indoors until they wither; then strip off all the leaves and the outer coverings of the stalks. If the stalks are thicker than one's thumb cut them with a reed and divide them into two portions; also the flowers themselves will have to be pulled apart and divided, that they may not be too large, and then stored in vessels. Next the liquid, as described above, must be poured in and a few small roots of assafoetida, whic the Greeks call σιλφιον added, then the whole must be covered with a stuffing of dry fennel so

techniques involved closely follow those used in the preservation of other foods, with the immersion of the food in the brine for a period of several days, after which the remaining salt is washed from the food. An important prerequisite for the preservation of such foods in salt seems not only to have been the required level of salinity, but also the drying of the fruit or vegetable concerned, being either placed directly in the sun to dry or by drawing off the moisture as brine by its immersion in salt. A number of recipes also refer to the use of salt in the making of Greek wine and according to Cato salt was sometimes added in place of must in the production of wine.<sup>36</sup>

The consumption of salt was not merely confined to that consumed by man, and the benefits of adding salt to fodder was known in the ancient world. It is estimated that an animal requires 2 kilograms of sodium per 100 kilograms of live weight to remain healthy, which in salt terms is 5 grams per kilogram.<sup>37</sup> Pliny considered that salt encouraged animals to pasture whilst improving the quality of the milk and cheese that was produced: *quin et pecudes armentaque et iumenta sale maxime sollicitantur ad pastus multum largiore lacte multoque gratiore etiam in caseo dote.*<sup>38</sup> Aristotle is more specific when he advises that flocks of sheep should be given salt every five days as not only does it increase the milk yield from the animals, but also makes them healthier and fatter.<sup>39</sup> Elsewhere, Aristotle describes the giving of salt to cattle in Illyria,

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that the liquid comes above it. The sprouts and stalks of cabbage, capers, kite's-foot, fleabane and house-leek must be put indoors to dry for several days until they wither, and then be preserved in the same manner as fennel, rue, savoury and marjoram. Some people preserve rue with hard brine only, without vinegar; then, when it is required for use, they wash it with water or even wine and pour oil over it before they use it. Green savoury and likewise green marjoram can be conveniently preserved by this method." (trans. Loeb ed.). cf also *De Re Rustica* 12.9-10.

<sup>36</sup>Cato *On Agriculture* 23.2: *si opus erit, defrutum indito in mustum de musto lixiuo coctum: partem quadragiesimam addito defriti uel salis sesquilibram in culleum.* [Wine production] "If necessary, add to the wine a fortieth part of must boiled down from untrod grapes, or a pound and a half of salt to the culleus." cf 24: *Vinum graecum hoc modo fieri oportet: uuas apicias percoctas bene legito; ubi delegris, in eius musti culleum aquae marinae ueteris uel salis puri modium.* "Directions for making Greek wine: gather carefully well-ripened Apician grapes, and add to the culleus of must two quadrants of old sea-water, or a modius of pure salt." (trans. Loeb ed.). cf also 105. Dioscorides 5.27, 5. 76.

<sup>37</sup>pers. comm. D. Cuddeford.

<sup>38</sup>Pliny *NH* 31.41.88: "Moreover sheep, cattle, and draught animals are encouraged to pasture in particular by salt; the supply of milk is much more copious, and there is even a far more pleasing quality in the cheese." (trans. Loeb ed.).

<sup>39</sup>Aristotle *Historia Animalium* 8.10: προβατα δε και αιγες εισι μεν ποιηφαγα, την δε νομην ποιουνται τα μεν προβατα προσεδρευοντα και μονιμως, αι δ' αιγες ταχυ μεταβαλλουσαι και των ακρων απτομεναι μονον, διο και του θερους διδοασιν αλας δαι πεντε ημερων μεδιμονν τοις εκατον. γινεται γαρ ουτως υγεινότερον και πιοτερον το ποιμνιον. και τα πολλα δε

although in this case he does not specify the reasoning behind this, merely that the animals will die without it.<sup>40</sup> As well as the more reliable advantages of salt to animal husbandry, it seems also to have been given more properties the use of which has not continued to the present day: Columella advises that salt be rubbed on the mouths and palates of animals as an aid to taming them.<sup>41</sup>

Not only was salt considered an important part of the diet and medical well-being of animals, but its medicinal worth was also recognised for man. Lacking any knowledge of human biochemistry, ancient medicine relied upon observation and common sense, salt was viewed in terms of heat and dryness, whilst it was known to

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αλιζοντες δια τούτο προσφερούσιν, οιον ἐν τε τοῖς αχυροῖς ἄλλας πόλλους (διψωντα γὰρ πίνει μαλλον) καὶ τού μετοπῶρου τῆν κολοκυντῆν ἄλι παττοντες, τούτο γὰρ καὶ γαλᾶ ποιει πλειον. καὶ κινουμένοι δε μεσημβριας πινούσι μάλλον πρὸς τῆν δεῖλην. πρὸς τε τοὺς τοκούς ἀλιζομένοι μειζω τα ουθατα καθιάσιν. "Sheep and goats are herbage eaters but in foraging the sheep graze intensively and stay in one place, while the goats quickly move on and only graze the tops. Flocks are fattened chiefly by their drink, hence in summer they give them salt every five days at the rate of a medimnus for every one hundred animals; for this makes the flock healthier and fatter. And for thihs reason they give most of their feeds with salt, for instance putting a good deal of salt in the bran (for they become thirsty and more inclined to drink) and in the autumn they sprinkle gourd with salt; for this also increases their milk. Also if they are kept moving at midday they tend to drink towards late afternoon. And with respect to their young, through being given salt they develope their udders bigger." (trans. Loeb ed.).

<sup>40</sup>Aristotle *De Mirabilis Auscultationibus* 138: Ἐν Ἰλλυριοῖς δὲ τοῖς Ἀρδιαίοις καλουμένοις, παρὰ τὰ μεθόρια τῶν Αὐταριατῶν κάκεινων, φασὶν ὄρος εἶναι μέγα, τούτου δὲ πλησίον ἄγκος, ὅθεν ὕδωρ ἀναπηδᾷ, οὐ πάσαν ὥραν ἀλλὰ τοῦ ἡρος, πολὺ τῶ τλήθει, ὃ λαμβάμοντες τὰς μὲν ἡμέρας ἐν τῷ στεγνῷ φυλάττουσι, τὰς δὲ νύκτας εἰς τὴν αἰθρίαν τιθέασι. καὶ πέντε ἢ ἕξ ἡμέρας τούτο ποιησάντων αὐτῶν πῆγνυται τὸ ὕδωρ, καὶ ἥνεται κάλλιστον ἄλας, ὃ ἐνεκεν τῶν βοσκημάτων μάλιστα διατηροῦσιν. οὐ γὰρ εἰσάγονται πρὸς αὐτοὺς ἄλας διὰ τὸ κατοικεῖν πόρρω αὐτοὺς θαλάσσης καὶ εἶναι αὐτοὺς ἀμίκτους. πρὸς οὖν τὰ βοσκήματα πλείστην αὐτοῦ χρείαν ἔχουσιν. ἀλιζοῦσι γὰρ αὐτὰ δις τοῦ ἐνιαυτοῦ. εἰν δὲ μὴ ποιήσωσι τούτο, συμβαίνει αὐτοῖς ἀπόλλυσθαι τὰ πλείστα τῶν βοσκημάτων. "Among the Illyrians who are called Ardiaeans along the boundary between them and the Autariatae, they say there is a high mountain, and near to it a glen from which the water rises, not at all seasons but in the spring, in considerable quantity, which they take and keep under cover by day, but put in the open at night. After they have done this for five or six days, the water hardens and becomes very fine salt, which they keep especially for the cattle; for salt is not imported to them because they live far from the sea and do not associate with others. Consequently they need it very much for the cattle; for they give them salt twice a year. If they fail to do this, most of the cattle are found to die." (trans. Loeb ed.).

<sup>41</sup>Columella *De Re Rustica* 6.2.7: *Post haec diductis malis educito linguam, totumque os et palatum sale defricato, libralesque offas in praesulsae adipis liquamine tinctas in gulam demittito, ac vini singulos sextarios per corno faucibus infundito: nam per haec blandimenta triduo fere mansuescunt, iugumque quarto die accipiunt, cui ramus illigatus temonis vice traicitur.* "After this you should pull the jaws apart and draw out the tongue and rub the whole mouth and palate with salt and put down the animal's throat cakes of a pound's weight of meal moistened with well-salted drippings of fat, and pour into their jaws a sextarius of wine at a time by means of a horn; for by blandishments of this kind they generally become tame in three days and allow themselves to be yoked on the fourth day." (trans. Loeb ed.).

encourage appetite and move the bowels<sup>42</sup>; characteristics that were also applied to salt fish. Dioscorides is the earliest source to attest the medicinal value of salt and he tells us that it was used both for binding, cleansing and dissolving<sup>43</sup>, a view that is reiterated by Pliny: *salis natura per se ignea est et inimica ignibus, fugiens eos, omnia erodens, corpora vero adstringens, siccans, adligans, defuncta etiam a putrescendi tabe vindicans, ut durent ea per saccula, in medendo vero mordens, adurens, repugrans, extenuans, dissolvens, stomacho tantum inutilis, praeterquam ad excitandam aviditatem*.<sup>44</sup> Its application was recommended for the treatment of bites and stings, eye afflictions, bruising and so forth, whilst mixing with wine, vinegar, oil, flour and honey, it could be used to treat migraine, ulcers, blisters, quinsy, stomach disorders, worms, pains in the shoulders and kidneys, colitis, griping, gout and sciatica to name but a few.<sup>45</sup> Pliny the Elder could go as far as to comment: *ibi maxime usurpanda observatione quae totis corporibus nihil esse utilius sale et sole dixit*.<sup>46</sup> Such was the beneficial nature of salt that in a number of cases it came to be associated with divinity and to form an essential part of sacrifice.

The uses of salt were not merely limited to men and animals and, although less well attested, we have a number of references to the use of salt in a number of industrial processes: namely, tanning and the production of litharge. It is used as an absorbent during the production of leather and in the cupellation of lead whereby salt is added to

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<sup>42</sup>For the role of salt-fish, salt and related substances in ancient medicine, cf Curtis, R I (1984) "Salted Fish Products in Ancient Medicine" in *Journal of the History of Medicine and Allied Sciences* 39.4 p 430-445.

<sup>43</sup>Dioscorides *A Greek Herbal* 126: "But the aforesaid salts have a virtue in common of much use both of binding and of cleansing and of dissolving, as also of repressing, and of extenuating and of incrusting, differing in ye more or less (strength)." (trans. Gunther, R T (1934) *The Greek Herbal of Dioscorides* (Oxford)).

<sup>44</sup>Pliny *NH* 31.45.98: "The nature of salt is of itself fiery, and yet it is hostile to fires, fleeing from them, corroding all things. but astringent to the body, drying it and binding, preserving corpses also from corruption so that they last for ages: in medicine however it is mordent, caustic, cleansing, reducing, and resolvent, injurious only to the stomach except in so far as it stimulates the appetite." (trans. Loeb ed.).

<sup>45</sup>Pliny *NH* 31.41.84; 31.45. 98-105; Columella *De Re Rustica* 6.17.7; 6.2.7; Dioscorides *Greek Herbal* 2.29; 2.33; 5.126; 5.127; 5.129.

<sup>46</sup>Pliny *NH* 31.45.102: "Hercin is especially applicable the saying that for the whole body nothing is more benedicial than salt and sun." (trans. Loeb ed.).

the metal whilst cooling.<sup>47</sup> Also apparently salt could be used for washing clothes: Aristotle comments that immersing clothes in the salt of the Dead Sea cleans them.<sup>48</sup>

Thus far the discussion of the value of salt has concentrated upon the more reliable evidence of the literary sources, with the result that although we might reasonably surmise that salt was commonplace and an important aspect of the economy, we cannot in any way quantify its importance nor form any valid economic appraisal of its role. We will, therefore, now turn our attention to attempting to raise some possible guidelines within which to place the scale of salt consumption within the ancient landscape.

As has been mentioned on several occasions above, salt was the primary ingredient included in the production of salted meats and sauces, however, I feel that is important quantify this in real terms so as to facilitate the study of the relationship between the supply of salt and the processing of fish. According to the *Geoponica* salt is required in quantities at a ratio of 1:8 to achieve the preservation of meats. Therefore, on the basis of salt having a density of 2.147 at 20° it should be possible to calculate the amount of salt that was required by a salt fishery during a single year. The excavated factory at Santa Pola consists of five tanks measuring respectively: 1.45 x 1.25 x 1.39m; 1.97 x 1.4 x 1.45m; 1.60 x 3.42 x 1.40m; 1.88 x 3.22 x 1.27m; 1.83 x 3.14 x 1.65m; which gives a total capacity for the factory at any one time of 31.3 m<sup>3</sup>, or in terms of salt 3.49 m<sup>3</sup>. Allowing for up to three months for the production of fermented sauces, to which must be added the incidence of the principal tunny migrations in Spring and September, we would have two three month periods in which the factory will have been able to stock fresh tunny. Outside this period, however, the factory will have remained active either with the processing of other types of fish and meats or in the production of purple dye, in which case we can envisage four principal

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<sup>47</sup>Pliny *NH* 33.34.106-110.

<sup>48</sup>Aristotle *Meteorologica* 2.3.359a: Εἰ δ' ἔστιν ὡς περ μυθολογοῦσιν τινες ἐν Παλαιστίνῃ τοιαύτη λίμνη, εἰς ἣν εἴαν τις ἐμβάλῃ συνδῆσας ἄνθρωπον ἢ υποζύγιον ἐπιπλεῖν καὶ οὐ καταδύεσθαι κατὰ τοῦ ὕδατος, μαρτύριον ἂν εἴη τι τοῖς εἰρημένοις. λέγουσι γὰρ πικρὰν οὕτως εἶναι τὴν λίμνην καὶ ἄλμυρὰν ὥστε μηδένα ἰχθὺν ἐγγίγνεσθαι, τὰ δὲ ἵμάτια ῥύπτειν, εἴαν τις διασεῖσθαι βρέχας. "If there were any truth in the stories they tell about the lake in Palestine it would further bear out what I say. For they say if you bind a man or beast and throw him into it he floats and does not sink beneath the surface; and that the lake is so bitter and salty that there are no fish in it, and that if you wet clothes in it and shake them out it cleans them."

refillings of the tanks through the year. Therefore, taking the salt requirements of the five tanks as being .05 kg, .095 kg, .182 kg, .183 kg and .2258 kg we are left to conclude that if the factory remained in regular use throughout the year it would require 6.36 kg in salt. This figure does not take into consideration the existence of other tanks, *dolia* etc.; the use of shorter production techniques with the use of artificial heat; the production of mixtures requiring lesser degrees of fermentation or lower levels of salinity; the use of the tanks for other purposes outside of the main fishing season. Equally it is heavily dependant upon the reliability of the salt to fish ratio of 1:8 given by the Geoponica.<sup>49</sup> Even if only tentatively accepted as reliable, the figures for the salt requirements of a fishery clearly underline the economic importance of such supply.

If we accept an average adult weight of approximately 60 kg, then on the basis of a human salt requirement of 15 grams of salt per kg then we are left with a figure of 900 grams of salt intake for an adult over the period of one year. From the population figure of 3382-2819 for Empuries<sup>50</sup>, for example, we can estimate that in terms of human population alone the community would need upwards of 30,438-25,371 kg of salt over one year. Evidently the maintenance of supply of such large quantities of salt both to industry and the populace as a whole, although admittedly in the case of the latter much of this demand will be met within the diet itself and without recourse to supplementation, will have been an economically important one. The requirements of a well organised, established and widespread pattern of production and exchange must

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<sup>49</sup>On the relative salinity of modern Far Eastern fish sauces. cf Curtis, R I (1991) op. cit. n. 30 p 20 which rarely fall below 1:5. It must be borne in mind that these high levels of salinity, although distasteful to the modern palate are necessary to prevent the decomposition of the meat.

<sup>50</sup> Figures for the population sizes of towns in the ancient world are extremely subjective with numbers ranging from 100 persons per hectare to 300 being cited on the basis of different forms of evidence. J C Russell (1985) The Control of Late Ancient and Medieval Population (Memoirs of the American Philosophical Society 160, Philadelphia) p 2-4, has suggested a figure of 100-120 persons per hectare for Pompeii. With the area of the Roman town and Neapolis of Empuries having been 21 ha and 3.6 ha respectively this would give a population figure of 2460-2952 - a figure that ignores the extent of the population resident beyond the walls which, in the case of Italy, Chisholm, M (1979) Rural Settlement and Land use (London) p 38 has calculated as being 14.6 % of the total population. Therefore, between 359-430 people were to be found residing outside the walled area of the town, thus giving a total population for the Neapolis and Roman town at Empuries of 2819-3382. Chisholm's figures, however, refer to population figures of Italy in 1936, and Curchin, L A (1987) 'Demography and Romanisation at Tarraco' in AEA 60 p 159-171 and Dominguez Monedero, A J (1986) 'La función económica de la ciudad griega de Emporion' in Protohistoria Catalana: 6è Colloqui Internacional d'Arqueologia de Puigcerdà. 7-9 de Desembre de 1984 (Institut d'Estudis Ceretans, Puigcerdà) p. 193-199 have preferred a figure of 300 persons per ha for the towns of Cataluña.

have been present to meet such demands and in this we can see the importance of the salt supply to ancient city states. It was of great economic importance for the states of the ancient world to secure access and control of salt supply, although such widespread requirements will have meant that much demand was satisfied by vehicles of production other than those of the state.

### 3. TECHNIQUES OF SALT PRODUCTION

A variety of techniques seem to have been utilised in the production of salt; the bulk of supply will have come from the evaporation of salt from brine or sea water, although mining seems to have been of some importance and the burning of plants is also cited as a method of production. The principal method of production consists of the drawing off of a brine from which the water is then evaporated by the application of either natural or artificial heat. Our principal source for the processes involved is the De Re Metallica of Georgius Agricola<sup>51</sup> who states that the brine was drawn from wells before being boiled so as to form a crystallised salt residue which was then removed and allowed to dry. Apparently blood or beer could be added to the boiling mixture although the efficacy of this is unclear. Unlike sea water, the exploitation of natural brine springs has the advantage of a much higher level of salinity: 25% compared to 3%; with the result that the utilisation of such springs is the most economically viable method of production, being particularly prevalent in more northerly European regions and it was around such that the prosperity of the Hallstatt sites was built.

In order to produce salt crystals from the brine, the water content has to be evaporated. This could be achieved either by solar evaporation or by direct heating. The latter seems to have been most prevalent in the more Northerly provinces where the vagaries of the climate meant that solar evaporation was insufficient. Aristotle appears to be referring to this when he describes a spring in Chaonia where the water is drawn off, part being heated and the other left to stand. When it has cooled and the moisture evaporated off with the heat a fine salt remains.<sup>52</sup> The water was drawn off

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<sup>51</sup>Georgius Agricola De re Metallica (Halle, 1556) trans. H C and L H Hoover (London, 1912), cf also Bridbury, A R (1955) England and the Salt Trade in the Later Middle Ages (Oxford).

<sup>52</sup>Aristotle Meteorologica 2.3.359a: ἔν τε γὰρ τῷ Ξαονία κρήνη τις ἔστιν ὕδατος πλατυτέρου, ἀπορρεῖ δ' αὕτη εἰς ποταμὸν πλησίον γλυκὺν μὲν, ἰχθῦς δ' οὐκ ἔχοντα. εἴλοντο γὰρ δὴ, ὡς οἱ

into basins which were placed on pottery supports over a fire. The water was then evaporated off leaving the salt residue in the pans. Whereas salt is soluble and thus leaves no trace within the archaeological record, remains of these pans and the clay supports ('Briquetage') provide a more complete picture of the operation of salt production than is possible for Southern Europe. The remains of briquetage forming the Red Hills of Southern England attest to the operation of the salt industry along the coasts of Britain, Belgium and France.<sup>53</sup> Kilns for the production of briquetage are also found in relation to these sites as, for example at Esnandes (Charente-Maritime, France).<sup>54</sup> Salt production, even allowing for the use of artificial heat, is reliant upon satisfactory climatic conditions making its production in Britain and France a seasonal occupation limited to the summer months. This seasonality combined with the similarity between archaeological evidence of pottery manufacture and of salting has meant that a link between the two in the local economic structure has been suggested<sup>55</sup> with salt production fitting into the agricultural calendar of the sites concerned. Briquetage evidence for the artificial evaporation of salt water ceases at some point prior to the late Empire, however, this is more likely to reflect a shift in production techniques with the introduction of metal boiling pans, than an actual decline or shift in the industry.

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ἐκεῖ μυθολογοῦσιν, ἐξουσίας δοθείσης ὑπὸ τοῦ Ἡρακλέους, ὅτ' ἦλθεν ἄγων ἐκ τῆς Ἐρυθείας τὰς βοῦς, ἅλας ἀντὶ τῶν ἰχθύων, οἳ γίνεταί αὐτοῖς ἐκ τῆς κρήνης τούτου γὰρ τοῦ ὕδατος ἀφεύροντες τι μέρος τιθέασιν, καὶ γίνεταί ψυχθὲν, ὅταν ἀπατμισῶ τούρον ἅμα τῷ θερμῷ, ἅλας, οὐ χοῦδροῖ ἀλλὰ χαύποι καὶ λεπτοὶ ὡσπερ χιῶν. "In Chaonia there is a spring of brackish water which flows into a neighbouring river that is sweet but contains no fish. For the inhabitants have a story that when Heracles, on his way through with the oxen from Erytheia, gave them the choice, they chose to get salt instead of fish from the spring. For they boil off some water from it and let the rest stand; and when it has cooled and the moisture has evaporated with the heat salt is left, not in lumps but in a loose powder like snow." (trans. Loeb ed.).

<sup>53</sup>cf Thoen, H (1981) "The Third Century Roman occupation in Belgium: the evidence of the Coastal Plain" in King, A and Henig, M (eds) The Roman West in the Third Century: Contributions from Archaeology and History BAR Int. Ser. 109 (Oxford) p 245-257; Gouletquer, P L (1970) Les Briquetages Amoricains: Technologie protohistorique du Sel en Armorique (Travaux du Laboratoire d'Anthropologie Préhistorique. Equipe de Recherche du CNRS n° 27. Faculté des Sciences, Rennes); cf also the various papers in de Brisay, K W and Evans, K A (eds) (1975) Salt. The Study of an ancient industry (Colchester).

<sup>54</sup>Texier, B (1990) "Les fours à sel protohistorique du site de l'Eglise à Esnandes (Charente-Maritime) dans leur contexte géographique et archéologique" in Aquitania 8 p 5-24.

<sup>55</sup>cf Bradley, R (1975) "Salt and Settlement on the Hampshire-Sussex Borderland" in de Brisay, K W and Evans, K A (eds) (1975) Salt. The Study of an ancient industry (Colchester) p 20-25.

The Elder Pliny appears to refer to this process of evaporation on a number of occasions, describing the salt springs of Babylon, Cappadocia and Chaonia.<sup>56</sup> Elsewhere he specifically states that within Spain the brine that was drawn off was known by the name of *muria*.<sup>57</sup> Strabo refers to the existence of salt springs at a number of locations within the coastal areas of Southern France<sup>58</sup>, although he tells us nothing of their exploitation.

Unlike northern Europe where the climate necessitated the use of artificial processes in the production of salt, the Mediterranean basin provides ideal climatic conditions for the evaporation of salt by solar energy alone. As a consequence, however, we lack precisely those features which enable the identification of salteries in the North, namely kilns and briquetage, making the identification of salteries dating to the Roman period extremely difficult. The bulk of the Peninsula's salt will have been met by the readily available supply of sea salt from the Mediterranean.<sup>59</sup> Such were the perceived merits of sea salt that it came to be the most highly regarded of all types and easily the most widespread. Cato gives us the most complete description of the production of salt by natural evaporation:

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<sup>56</sup>Pliny *NH* 31.39.82: *fit et puteis in salinas. prima densatio Babylone in bitumen liquidum cogitur oleo simile, quo et in lucernis utuntur. hoc detracto subest sal. et in Cappadocia e puteis ac fonte aquam in salinas ingerunt in Chaonia excocunt aquam ex fonte refrigerandoque salem faciunt inertem ne candidum.* "Salt is also made by pouring water from wells into salt pools. At Babylon the first condensation solidifies into a liquid bitumen like oil, which is also used in lamps. When this is taken away, salt is underneath. In Cappadocia too they bring water into salt pools from wells and a spring. In Chaonia there is a spring, from which they boil water, and on cooling obtain a salt that is insipid and not white." (trans. Loeb ed.).

<sup>57</sup>Pliny *NH* 31.40.83: *Hispaniae quadam sui parte et puteis hauriunt muriam appellantes.* "In one part of the provinces of Spain they draw off the brine from wells and call it *muria*." (trans. Loeb ed.).

<sup>58</sup>Strabo *Geography* 4.1.6: ἐκ μὲν τῆς Πυρρήνης ὁ τε Ρουσκίνων καὶ ὁ Ἰλλίβιρρις, πόλιν ἔχων ὁμώνυμον ἐκάτερος αὐτῶν, τοῦ δὲ Ρουσκίνωνος καὶ λίμνη πλησίον ἐστὶ καὶ χωρίον ὑψυδρον μικρὸν ὑπὲρ τῆς θαλάττης, ἀλυκίδων μεστόν. "From the Pyrenees flow both the Ruscino and the Ilibirris, each of them having a city of like name: and, as for the Ruscino, there is not only a lake nearby, but also, a short distance above the sea, a marshy district, full of salt springs." (trans. Loeb ed.); cf also 4.1.7: "Between Massilia and the outlets of the Rhodanus there is a plain, circular in shape, which is as far distant from the sea as a hundred stadia, and is also as much as that in diameter. It is called Stony Plain from the fact that it is full of stones as large as you can hold in your hand, although beneath the stones there is a growth of wild herbage which affords abundant pasturage for cattle. In the middle of the plain stand water and salt springs, and also lumps of salt." (trans. Loeb ed.).

<sup>59</sup>According to Way, R (1962) op. cit. n. 22, approximately half of the total Spanish salt production of 1,300,000 metric tonnes and most of that of Portugal of 2,700 tonnes is derived from sea water.

*Salem candidum sic facito. Amphoram defracto collo puram inpleto aquae purae, in sole ponito. Ibi fiscellam cum sale populari suspendito et quassato suppletoque identidem. Id aliquotiens in die cotidie facito, usque adea donec sal desiverit tabescere biduum. Id signi erit: menam aridam vel ovum demittito: si natabit, ea muries erit, vel carnem vel caseos vel salsamenta quo condas. Eam muriam in labella vel in patinas in sole ponito. Usque adeo in sole habeto, donec concreverit. Inde flos salis fiet. Ubi nubilatur et noctu sub tecto ponito; cotidie, cum sole erit in sole ponito.*<sup>60</sup>

Cato is describing a process by which the salt water is placed in an amphora and regularly stirred over a period of days during which the salt settles. The brine is then placed in flat vessels or pans and exposed to the sun. Some techniques, however, would appear to be less intensive; Rutilius Namatianus describes salt pans in the words: *namque hoc censetur nomine salsa palus, qua mare terrenis declive canalibus intrat multifidosque lacus parvula fossa rigat.*<sup>61</sup> Pliny the Elder refers to similar natural condensation occurring within a number of salt lakes: *sal omnis aut fit aut gignitur, utrumque pluribus modis, sed causa gemina, coacto umore vel siccato. siccat in lacu Tarentino aestivis solibus, totumque stagnum in salem abit, modicum alioqui, altitudine gemina non excedens, item in Sicilia in lacu qui Cocanicus vocatur et alio iuxta Gelam*<sup>62</sup>, whereby the water is condensed by the heat of the sun to leave a powder-like salt residue. There would, therefore, appear to have been two techniques

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<sup>60</sup>Cato *De Re Agricultura* 88: "Recipe for bleaching salt: Break off the neck of a clean amphora, fill with clear water, and place in the sun. Suspend it in a basket filled with common salt and shake and renew from time to time. Do this daily several times a day until the salt ceases to dissolve for two days. You can find when it is saturated by this test: place a small dried fish or an egg in it, and if it floats you have a brine strong enough to pickle meat or cheese or salted fish. Place this brine in flat vessels or in pans and expose it to the sun. Keep it in the sun until it solidifies, and you will have a pure salt. In cloudy weather or at night put it under cover, but expose it to the sun every day when there is sunshine." (trans. Loeb ed.).

<sup>61</sup>Rutilius Namatianus *De Reditu Suo* 1.476-8: "it is on this score that value is set upon the salt-marsh, where the sea water, running down through channels in the land, makes entry, and a little trench floods the many parted ponds." (trans. Loeb ed.).

<sup>62</sup>Pliny *NH* 31.39.73: "All salt is artificial or native; each is formed in several ways, but there are two agencies, condensation or drying up of water. It is dried out of the Tarentine lake by summer sun, when the whole pool turns into salt, although it is always shallow, never exceeding knee height, likewise in Sicily from a lake, called Cocanicus, and from another near Gela." (trans. Loeb ed.).

of production: the first described by Cato would seem to have included some preparation of the salt solution prior to its exposure to the sun, a method which probably would have resulted in a quicker preparation of the salt. The second technique, which is hinted at by Rutilius Namatianus would see the running of sea water from the shore to a series of flat pans in which it settled under the heat of the sun leaving a residue of salt. This second method would seem to have been a more commonplace sight and seems to have been the one employed at the one attested saltery along the East coast of Tarraconensis, namely that of Acequia de Noria.

Antonio Jose Cavanilles writing in the Eighteenth Century was the first to refer to existence of ancient remains at Acequia de Noria.<sup>63</sup> Located only a short distance down the shore from the fish factories of Punta de l'Arenal and Punta del Castell a large rock cut channel measuring approximately 2 metres by 3-4 metres deep has been found running from the shore inland for a distance of 100 metres to the salt pans (no longer extant) of Las Salinas. Clearly it served to bring sea water through to the pans, and remains of grooving points to presence of some form of sluice gate to control the flow of water to and from the salt flats. Evidently the water was then spread over the shallow pans to evaporate off to leave the salt for use in the nearby fish factories. Early writers believed the channel to have dated to the Carthaginian period and Figueras Pachero, writing in the 1940s refers to the existence of tanks and installations within the area although no traces of these survive to the present day.<sup>64</sup> Whether or not these remains consist of traces of a fish factory within the immediate environs of the salt pans is unclear, and the close proximity of those of Punta de l'Arenal and Punta del Castell must raise questions as to the possibilities of joint ownership between the sites and to the precise juridical and practical nature of the supposed Imperial monopoly on salt production, which we shall discuss shortly in the next section.

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<sup>63</sup>cf Cavanilles, A J (1795) Observaciones sobre la Historia Natural, Agricultura, Poblacion y Frutos del Reyno de Valencia (Zaragoza) p 280.

<sup>64</sup>cf Figueras Pachero, F (1945) "Panorama arqueologico de Javea y sus cercanias" in AEA 18 p1-33; Martin, G (1970) "Las Pesquerias Romanas de la Costa de Alicante" in PLAV 10 p139-153; Martin, G and Serres, M<sup>a</sup> D (1970) La Factoria Pesquera de la Punta de l'Arenal y otros restos romanos de Javea (Alicante) (TV del SIP 38, Valencia).

We have already mentioned Strabo's description of the salt mines and rivers of Turdetania<sup>65</sup> and it seems probable that as today the Peninsula possessed plentiful salt mines. Mining was limited to the excavation of surface veins of salt, although the prosperity of salt mines is attested by a number of sources. Arrian refers to those of Egypt and describes the shipment of salt over apparently long distances in palm baskets.<sup>66</sup> Evidently the mines of Egypt and the Sinai were of some note being also referred to by Vitruvius<sup>67</sup> and the Elder Pliny, along with those of Cappadocia, Sicily and India.<sup>68</sup> A number of sources refer to the existence of salt mines and springs within the hinterland of Africa, although the remoteness of these sites will probably have

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<sup>65</sup>Strabo 3.2.6.

<sup>66</sup>Arrian *Anabasis of Alexander* 3.3.4: "There are natural salts in the district, to be obtained by digging; some of these salts are taken by priests of Ammon to Egypt. For whenever they are going towards Egypt, they pack the salt into baskets woven of palm leaves and take them as a present to the king or someone else. The grains of this salt are large, some of them have been known to be more than three fingers breadth; and it is as clear as crystal."

<sup>67</sup>Vitruvius *De Architectura* 8.3.7: *Item Paraetonio et quod est iter ad Ammonem et Casio ad Aegyptum lacus sunt palustres, qui ita sunt salsi, ut habeant insuper se salem congelatum. Sunt autem et alii pluribus locis et fontes et flumina et lacus, qui per salifodinas percurrentes necessario salsi perficiuntur.* "At Paraetonium and on the road to the oracle of Ammon, and at Mt. Casius in Egypt, there are marshy lakes which contain so much salt that it cakes over them. In many other places there are springs and rivers and lakes which run through salt mines and necessarily are made salt." (tran. Loeb ed.).

<sup>68</sup>Pliny *NH* 31.39.77-79: *sunt et montes nativi salis, ut Indis Oromenus, in quo lapicidinarum modo caeditur renascens, maiusque regum vectigal ex eo est quam ex auro atque margaritis. effoditur e terra, ut palam est umore densato, in Cappadocia. ibi quidem caeditur specularium lapidum modo. pondus magnum glaebis quas micas vulgus appellat. Gerris Arabiae oppido muros domosque e massis salis faciunt aqua feruminantes. invenit et iuxta Pelusium Ptolomaeus rex, cum castra faceret. quo exemplo posteo inter Aegyptum et Arabiam etiam squalentibus locis coeptus est ineniri detractis harenis, qualiter et per Africae sitiencia usque ad Hammonis oraculum, is quidem crescens cum luna noctibus. nam et Cyrenaici tractus nobilitantur Hammoniaco et ipso, quia sub harenis inveniatur, appellato.* "There are also mountains of natural salt, such as Oromenus in India, where it is cut out like blocks of stone from a quarry, and ever replaces itself, bringing greater revenues to the rajahs than those from gold and pearls. It is also dug out of the earth in Cappadocia, being evidently formed by condensation of moisture. Here indeed it is split into sheets like mica; the blocks are very heavy, nicknamed by the people 'grains'. At Gerra, a town of Arabia, the walls and houses are made of blocks of salt cemented with water. Near Pelusium too King Ptolemy found salt when he was making a camp. This led afterwards to the discovery of salt by digging away the sand even in the rough tracts between Egypt and Arabia, as it is also found as far as the oracle of Hammon through the parched deserts of Africa, where at night it increases as the moon waxes. But the region of Cyrenaica too is famous for Hammoniac salt, itself so called because it is found under the sand." (trans. Loeb ed.). cf also Vitruvius *De Architectura* 8.3.7: *Sunt autem et alia multa genera, quae habent suas proprietates, ut in Sicilia flumen est Himeras, quod, a fonte cum est progressum, dividitur in duas partes; quae pars profluit contra Etruriam, quod per terrae dulcem sucum percurrit, est infinita dulcedine, quae altera parte per eam terram currit, unde sal foditur, salsum habet saporem.* "There are many kinds of water that have their properties. In Sicily, the river Himeras, on leaving its source, divides into two branches: one flows towards the coast which faces Etruria and is of infinite sweetness, because it runs through the

meant that such was not traded.<sup>69</sup> Much of the extraction of salt described by the ancient literary sources seems to have been on a small scale with only surface deposits being reached. There appear, however, to have been a number of larger salt mines, such as those at Egelasta in Spain, and beyond the Empire at Ocomenus in India. For lack of evidence it would appear that these were operated and administered along lines similar to those of other mines, and it is here that we would see the Imperial monopoly on salt production at its most enforceable; more shall be said on this shortly when we turn to the juridical nature of salt production and the exact nature of Imperial control.

A further technique involving the utilisation of marine salt and which leaves no archaeological trace is the collection of residual salt left along the shore by the withdrawal of the high tide.<sup>70</sup> With low tide the sun causes the crystallisation on salt upon the sand which is collected and filtered by washing with sea water to remove impurities and produce a concentrated solution. The water was then evaporated off to leave a pure salt as residue. A burning of organic materials seems to have resulted in a salt residue and is attested within Gaul and Germany<sup>71</sup> as well as parts of Italy.<sup>72</sup>

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sweet juices of the soil; the other stream which runs through the other part where there are salt mines has a salt flavour." (trans. Loeb ed.).

<sup>69</sup>cf Pliny *NH* 5.5.34: [The Amantes] "They built their houses of blocks of salt quarried out of their mountains like stone." cf also Herodotus *Histories* 4.181-8.

<sup>70</sup>Pliny *NH* 31.39.74: *aliud genus ex aquis maris sponte gignitur spuma in extremis litoribus ac scopulis relicta*. "Another kind produced from sea water spontaneously is foam left on the edge of the shore and on rocks." (trans. Loeb ed.).

<sup>71</sup>Pliny *NH* 31.39.82-40.83: *Galliae Germaniaeque ardentibus lignis aquam salsam infundunt. XL.....illi quidem et lignum referre arbitrantur, quercus optima, ut quae per se cinere sincero vim salis reddat, alibi corylus laudatur. ita infuso liquore salso arbor etiam in salem vertitur. quicumque ligno confit sal niger est*. "In the provinces of Gaul and Germany they pour salt water on burning logs. XL.....The former indeed think that the wood used also makes a difference. The best is oak, for its pure ash by itself has the properties of salt: in some places hazel finds favour. So when brine is poured on it even wood turns into salt. Whenever wood is being used in its making salt is dark." Varro *De Re Rustica* 1.7.8: *In Gallia Transalpina intus, ad Rhenum cum exercitum ducerem, aliquot regiones accessi, ubi nec vitis nec olea nec poma nascerentur, ubi agros stercovarent candida fossicia creta, ubi salem nec fossicium nec maritimum haberent, sed ex quibusdam lignis combustis carbonibus salsis pro eo uterantur*. "When I was in command of the army in the interior of Transalpine Gaul near the Rhine. I visited a number of spots where neither vines nor olives nor fruit trees grew; where they fertilized the land with a white chalk which they dug; where they had no salt, either mineral or marine, but instead use salty coals obtained by burning certain kinds of wood." (trans. Loeb ed.).

<sup>72</sup>Aristotle *Meteorologica* 2.3.359a: τοιοῦτον δ' ἕτερον γίγνεται καὶ ἐν Ὀμβρικοῖς. ἔστι γὰρ τις τόπος ἐν ᾧ πεφύκασι καλάμοι καὶ σχοῖνος. τούτων κατακάουσι, καὶ τὴν τέφραν ἐμβάλλοντες εἰς ὕδωρ ἀφέψουσιν. ὅταν δὲ λίπωσί τι μέρος τοῦ ὕδατος, τοῦτο ψυχθὲν ἁλῶν γίγνεται πλεθός." "Something of a similar sort happens also in Umbria. There is a place where reeds and rushes grow: these they burn and throw their ashes into water and boil it till there is only a little left, and this when allowed to cool produces quite a quantity of salt." (trans. Loeb ed.).

The most important technique with regard to the production of fish sauces will clearly have been the evaporation of sea water in salt-pans. Brine will not have been transported over great distances and is likely to have been produced near to its point of demand. Unfortunately, the transport of salt itself is difficult to identify; in the northern provinces where it seems to have been carried in briquetage containers we are able to see well established patterns of exchange, however, in the south the use of baskets as described by Arrian may well have been more commonplace, although the latter will leave no traces archaeologically. Although the lack of archaeological evidence may well result in the under representation of the trade in salt from region to region, its ubiquity and ready availability, at least within the coastal areas will have meant that there was no necessity for it to be traded over longer distances. It would seem to have been produced within the locality in which it was required and the existence of unified ownership between it and one of its principal markets, namely the production of salt fish must now be considered.

#### 4. THE IMPERIAL MONOPOLY AND RELATIONSHIP BETWEEN THE OWNERSHIP OF SALT SOURCES AND FISH FACTORIES

The importance of salt was such that it formed a state monopoly in a number of Hellenistic kingdoms: Ptolemaic Egypt, Seleucid Syria and Barcid Carthage to name but the most prominent<sup>73</sup>, and it is possible that the Roman Government took control of the salteries of Carthago Nova directly from the Carthaginian state in 209 BC.

A state monopoly on salt may have existed within Rome from an early date although the lack of evidence from the Republic makes any such identification problematic: in 509 BC when Porsenna threatened the city, the Senate brought up stocks of corn to feed the populace and took over the salt monopoly so as to control prices.<sup>74</sup> It is unclear, however, whether or not this measure lasted beyond the

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<sup>73</sup>cf Etienne, R (1970) "A propos du 'Garum Sociorum'" in *Latomus* 29 p 297-313, cf esp. p 304-305.

<sup>74</sup>Livy *History* 11.9.6: "And they feared not only the enemy but their own citizens, lest the Plebs should be terror stricken and, admitting the Princes into the city, should even submit to slavement for the sake of peace. Hence the Senate at this time granted many favours to the Plebs. The question of subsistence received special attention, and some were sent to the Volsci and others to Cumae to buy up corn. Again, the monopoly on salt, the price of which was very high, was taken out of the hands of individuals and wholly assumed by the Government. Imports and taxes were removed from the Plebs

immediate crisis. In 204 BC Livy has the Censors regulating the price of salt<sup>75</sup>, although again this measure might only have been a short-term one. A monopoly of salt is conventionally accepted as having existed during the Empire although it is not clear how far back this can be dated. The *Codex Iustinianus* states that the sale of salt is only permitted on the part of salt pan contractors and that anyone person contravening this must had over the proceeds of the transaction to the contractor.<sup>76</sup> The rights to work the salt monopoly were evidently leased out to individual contractors, for example, the *Conductor Pascui, Salinarum et Commerciorum* attested at Apulum in Dacia<sup>77</sup> and the *Conductor Pascui et Salinarum* at Vezcel (Dacia).<sup>78</sup> Towns may also have been able to lease salt rights such as the *Salinatores Civitatis Menapiorum* and the *Salinatores Civitatis Morinorum* from Gaul.<sup>79</sup> The more general title of *salinatores* is also attested for individuals<sup>80</sup> although their juridical freedom is unclear. It seems that the Imperial salt monopoly was operated along similar lines to those employed for other forms of mineral extraction with the mines being leased to a variety of contractors in return for a percentage of the yield.

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that they might be borne by the well-to-do, who were equal to the burden: the poor paid dues enough if they reared children." (trans. Loeb ed.).

<sup>75</sup>Livy *History* 29.37.3.

<sup>76</sup>*Codex Iustinianus* 4.61.2: *Si quis sine persona mancipium, id est salinarum conductorum, sales emerit vendere temptaverit, sive propria audacia sive nostro munitus oraculo, sales ipsi una cum eorum pretio mancipibus addicentur.* "If anyone without the role of contractor, that is to say salt pan contractors, has brought salt or tried to sell it, either by his own authority or equipped with our rescript, the salt together with its price shall be handed over to contractors."

<sup>77</sup>*CIL* iii.1209: P.AEL.P.FIL.PAP / STRENUO.EQ / P.SACERD.ARAE / AUG.AUGURI.ET / II.VIRALCOL / SARM. AUGUR / COL.APUL.DEC / COL.DROB.PAT / RON.COLLEGIOR / FABR.CENTO/ NAR.ET.NAUT / AR.CONDUC.PAS / CUI.SALINAR / ET.COMMER / CIOR.RUFINUS / EIUS.

<sup>78</sup>*CIL* iii.1363: SILVANO.DOMESTICO / P.A[elius].EUPHORUS / PRO. SALUTE.P.AE[li is] MARI.CONDUCTORIS / PASC.ET.SALI / NAR.[i].V.[s].

<sup>79</sup>*CIL* xi.390: L.LEPIDIO.L.F.AN / PROCULO / MIL.LEG.V.MACEDON / LEG.EIUS.LEG.EIUSD.II / LEG.VI.VICTRICIS / LEG.XV.APOLLINAR / PRIM.LEG.XIII.GEMIN / DONIS.DONATO.AB / IMP.VESPASIANO.AUG / BELLO.IUDAICO.TORQUIB / ARMILLIS.PHALERIS / CORONA.VALLARI / SALINATORES.CIVITATIS / MENAPIORUM.OB.MER.EIUS / SEPTIMIA.F.REPONEND / CURAVIT.

*CIL* xi.391: L.LEPIDIO.L.F.AN / PROCULO / MIL.LEG.V.MACEDONIC / LEG.EIUSD.LEG.EIUSD.II / LEG.VI.VICTRICIS / LEG.XV.APOLLINAR / PRIM.LEG.XIII.GEMINAE / DONIS.DONATO.AB.IMP / VESPASIANO.AUG.BELLO / IUDAICO.TORQUIB.ARMIL / PHALERIS.CORONA.VA[III]AR / SALINATORES.CIVITATIS / MORINORUM.OB.MER.EIUS / SEPTIMIA.F.REPONEND/CURAVIT.

<sup>80</sup>*CIL* xii.5360: [Narbo. Peyriac sur Mer] V.L.SALONUS.L.P.L / BUCCIO.SIBI.ET / O.L.SALONIO.L.P.L / HILARO.SALINTORI.

During the Republic, mining rights and the allocation of taxes seem to have been given over to the *Publicani*.<sup>81</sup> Such would seem to have been the case in Spain when Diodorus describes the massive influx of Italian immigrants seeking fortunes.<sup>82</sup> The mines near Carthago Nova, and possibly also the salt mine at Egelasta although this is not referred to were included in the *Agri Publici* listed by Cicero.<sup>83</sup> Larger concerns were leased to companies such as the *Societas Montis Argentoris Ilucronensis* near Mazarron<sup>84</sup> and the *Socii Sisaponenses* at Almaden<sup>85</sup>, however, smaller concerns may well have remained in private hands: lead ingots from the wreck of Ses Salines appear to have been stamped first with the names of private individuals, presumably the mine owners before being sold to the State.<sup>86</sup> Suetonius records that Tiberius was responsible for transferring mineral rights from a number of cities and individuals and handing them over to the State.<sup>87</sup> This process becomes particularly prevalent during the Flavian period which saw the centralisation of control with increasing areas being brought under the administration of Imperial procurators, such as the Procurator Montis Mariani in the Sierra Morena.<sup>88</sup> Not all mines were in the possession of the state however; Gold mines were probably all under the control of the State by the Imperial period, however, other forms of mining seem to have remained in private hands.<sup>89</sup>

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<sup>81</sup>Plutarch *Cato Minor* 16.

<sup>82</sup>Diodorus 5.36.

<sup>83</sup>Cicero *De Leg. Agraria* 1.2.5 "They order the lands of the inhabitants of Attalia and Olympus to be sold, towns which the victory of the gallant Publius Servilius added to the dominion of the Roman people; next, the royal territories in Macedonia, acquired by the valour partly of Titus Flaminius, partly of Lucius Paullus, who conquered Perses; next, that most excellent and fruitful land of Corinth, which by the successful campaigns of Lucius Mummius was added to the revenues of the Roman people; and afterwards the lands in Spain near New Carthage, which became Roman possessions by the distinguished valour of the two Scipios; then they sell old Carthage itself, which Publius Africanus consecrated to be eternally remembered, stripped of its buildings and walls, either to mark the disaster to the Carthaginians, or as evidence of our victory, or after some religious ceremony had been enjoyed." (trans. Loeb ed.). cf also Cicero *De Lege Agraria* 2.19.50-51; Strabo *Geography* 3.2.10.

<sup>84</sup>*CIL* xv.7916.

<sup>85</sup>*CIL* x.3964.

<sup>86</sup>cf Parker. A J (1974) "Lead ingots from a Roman ship at Ses Salines, Majorca" in *IJNA* 3.1 p 147-150.

<sup>87</sup>Suetonius *Tiberius* 49: "He made many states and individuals forfeit their ancient immunities and mineral rights, and the privilege of collecting taxes." (trans. Graves, R, Penguin ed.).

<sup>88</sup>*CIL* ii.956, 1179.

<sup>89</sup>On the administration of mines, cf Edmondson, J C (1987) *Two Industries in Roman Lusitania: Mining and Garum Production* (BAR Int. Ser. 362, Oxford); Doumergue, C (1990) *Les Mines de la Péninsule Ibérique dans l'Antiquité Romaine* (Collection de l'École Française de Rome 127, Rome); Richardson, J S (1976) "The Spanish Mines and the Development of Provincial Taxation" in *JRS* 66 p 139-152; Davies, O (1935) *Roman Mines in Europe* (Oxford).

Ownership of mineral resources seems to have been included with that of the land upon which such were found. The Digest of Justinian records that the owner of the usufruct might operate mines of any type upon his land as long as it does not impinge upon the cultivation of the land.<sup>90</sup> The Codex Theodosianus refers to private quarries within Macedonia and Illyricum.<sup>91</sup> A number of further constitutions from the same source grant the freedom of marble quarries to any individual.<sup>92</sup> According to two constitutions dated to 382 and 384 AD respectively, all persons have the right to mine on land in return for the payment of one tenth of the produce to the Treasury and a similar sum to the owner of the land.<sup>93</sup>

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<sup>90</sup>Digest 13.5: "May the Usufructory himself open stone quarries or chalk and sand pits? My opinion is that he is indeed entitled to do so, providing he does not appropriate this purpose a part of the land required for something else. Accordingly he can search for site suitable for quarries and other similar mining operations; therefore, he can either work such mines of gold, silver, sulphur, copper, iron, or other minerals as were opened by the owner, or he can open such mines himself, providing this does not prejudice the cultivation of the land. If it should happen that the income from a mine he had opened should exceed that from the vineyards, plantations, or olive groves which were already there, he may perhaps be allowed to cut these down, since he is free to improve the position of the bare owner." (trans. Mommsen, T, Krueger, P and Watson, A (1985) The Digest of Justinian (Philadelphia).).

<sup>91</sup>Codex Theodosianus 10.19.8: "Emperors Valens, Gratian, and Valentinian Augustuses to the Senate. We formerly granted under fixed conditions the right to dig out and to cut out from private stone quarries throughout Macedonia and the district of Illyricum. But upon you, O Conscript Fathers, whenever you wish, shall be conferred a more liberal grant, namely, that each of you at his own expense and to his own profit shall acquire this right, without fear of the operation of the special tax and the expenses of port dues." (trans. Pharr, C (1952) The Theodosian Code and Novels and the Sirmonian Constitutions (Princeton).).

<sup>92</sup>Codex Theodosianus 10.19.1-3: "1. Emperor Constantine Augustus to Maximus, Fiscal Representative of Africa. To all persons who so wish, We grant the right to cut marble from any quarry whatever, so that if any person should decide to quarry a mineral and make from it anything whatever, he shall also have the unrestricted right to sell it. 2. Emperor Julian Augustus to Rufinus, Count of the Orient. Since the desire for marble has enormously increased the price of such stone, in order that this expensive wish may be alleviated by an abundant supply, We permit that all men who wish to quarry shall have the license granted to them. For We consider that the result will be that very many veins of glistening stone will also come to light and into use. 3. Emperors Valentinian and Valens Augustuses to Cresconius, Count of Minerals and Mining. With long-pondered deliberation We consider that a sanction must be issued to the effect that if any person should wish the industry of mining to flourish, by his own labour he may acquire advantages both for himself and for the State. Therefore, if any persons voluntarily should come together in larger numbers for this purpose, Your Laudability shall require such persons to pay eight scruples each of gold dust. Moreover, if they should be able to collect more, they shall preferably sell the same to the fisc, from which they shall receive an appropriate price from our largesses." (trans. Pharr, C (1952) The Theodosian Code and Novels and the Sirmonian Constitutions (Princeton).).

<sup>93</sup>Codex Theodosianus 10.19.10-11: "10. Emperors Gratian, Valentinian and Theodosius Augustuses to Florus, Praetorian Prefect. If any person with laborious digging should follow a vein of stone through land belonging to private persons, he shall pay a tenth to the fisc and a tenth to the owner of the land, and the remaining amount he may vindicate to his own purposes. 11. The same Augustuses to Cynegius, Praetorian Prefect. In accordance with the law previously issued, all persons shall have

Rights for the extraction of salt seem to have been treated in a similar fashion being incumbent upon the owner of the land, who had the choice either to exploit such himself or to grant that privilege to others in return for a share of the proceeds. In Egypt work in the salt pans or mines was an obligation<sup>94</sup>, however, its peculiar judicial character meant that the province as a whole was Imperial property. The Theodosian Code differentiates between privately owned salt works and those that serve the baths of the city of Rome, although it would appear that such pans were in the possession of individuals who leased the rights of operation from the Government.<sup>95</sup> Commensurate with Justinian's legislation prohibiting the sale of salt, that we have referred to above, is the corollary that such transactions were taking place. The sheer extent of salt extraction around the coasts of Gaul and Spain will have rendered any centralised control impossible, whilst the importance of the large quantities of salt to the fish salting industry, the proximity of such to sources of salt and the presence of *villae* like those at Calpe and Punta de l'Arenal would suggest some concentration of ownership between these factors. Rutilius Namatianus describes the presence of salt pans on the

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the right to work private quarries, to cut out and cut up the stone, if a rich vein of marble is available to them, with the provision that a tenth part shall be assigned to the account of Our fisc and a tenth to the owner of the land. The remainder shall become the property of those operating the quarry, according to the aforesaid law, and the operators shall have the license to sell, to give, to transfer such stone, wherever their desire may persuade them." (trans. Pharr, C (1952) The Theodosian Code and Novels and the Sirmonian Constitutions (Princeton).):

<sup>94</sup>cf Nenquin, J (1961) op. cit. n. 3 p 102. I regret that I have been unable to consult the source directly, cf Johnson, J, Martin, V, Hunt, A S (1915) Catalogue of the Greek Papyri in the John Rylands Library volume 2 p 92.

<sup>95</sup>Codex Theodosianus 11.20.3: "Emperors Arcadius and Honorius Augustuses to Hadrianus, Praetorian Prefect. Up to a certain amount the slight income of buildings shall not assume any burden of the superinduction with reference to their possession. However, throughout all the cities, municipalities, villages, and fortresses the income for one year shall be paid as tax from all storehouses, baths, workshops, taverns, dwelling houses, dining rooms, and salt works, if such property in the aforesaid places is held under a lease that requires rental payments. No person shall be exempted, but the salt works shall be excepted which are administered by the supervisors and which serve the baths of the Roman people. The owners of such places, with due devotion, shall deliver the income for one year as the tax payment, that is for the third year of the indiction, with the exception, of course, of the Eternal City, which is exempted from such a compulsory public service by the reverence of her own majesty. Of course, the reasonable method shall be observed that if any owner should be absent, the amount which has been prescribed shall be paid either by his procurators or by those persons who hold such places under lease, and such payments shall be accredited to the account of the owners. The condition shall be observed that they shall know with all haste they must pay as much as they have been accustomed to collect." (trans. Pharr, C (1952) The Theodosian Code and Novels and the Sirmonian Constitutions (Princeton).).

estate of a certain Albinus at Volaterra<sup>96</sup>; such a pattern of local individual ownership is likely to have been the norm with regard to the numerous salt pans located along the coast of Tarraconensis. The lack of evidence as to the ownership of salt pans and salt mines makes any attempt to ascertain such a hypothetical one, however, we should be able to make an, at least tentative answer.

Some form of monopoly will have existed during the Roman period, being administered in a fashion similar to that employed within the mining industry as a whole, with the leasing out of rights to contractors in return for a share of the product. However, the legal evidence suggests that salt was included with other minerals in being the possession of the landowner, therefore, the employment of either procurators or contractors will have only applied to *Ager Publicus*, whilst extraction elsewhere will have been in the hands of individuals. This fits with the presence of villas and fish factories in the immediate confines of salt pans. Larger scale extraction in the form of salt mines may have been in the hands of State contractors, although the inclusion of Egelasta within the *Ager Publicus* of Carthago Nova listed by Cicero<sup>97</sup> is unattested and Cicero is more likely to be referring to the prominent silver mines of the region. The need for such large quantities of salt for the salting of fish will have meant it was a commodity of primary importance and joint ownership of both fishery and saltery will have been the norm.

## 5. THE ROLE OF PURPLE DYE IN ANTIQUITY

An important adjunct to the production of salt fish was the processing of marine molluscs to produce purple dye. The abundance of references in the classical sources attest to its scale and importance, however, although its role as the major status symbol of the ancient world<sup>98</sup> is well studied, little space has been devoted to its place within the economic structure.

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<sup>96</sup>Rutilius Namatianus *De Reditu Suo* 1.475: *subiectas villae vacat adspectare salinas*. "We find time to inspect the salt pans lying near the mansion." (trans. Loeb ed.); cf also n. 88.

<sup>97</sup>Cicero *De Lege Agraria* 1.2.5.

<sup>98</sup>cf Reinhold, M (1970) *History of Purple as a status symbol in Antiquity* Collection Latomus volume 116 (Brussels).

Such was subsequent importance of purple dye that various myths were developed to explain its origins and discovery. The most prevalent account seems to have been that in which the dye was accidentally discovered by a dog eating the molluscs and the resulting purple attracting notice.<sup>99</sup> The discovery seems also to have been widely associated with Heracles, the Phoenician Melqart. Palaephatus records that Heracles made a purple cloak for the mythical king Phoenix who is said to have decreed that the use of purple should be reserved for the kings.<sup>100</sup>

Whatever the veracity of the mythological accounts of the discovery of sea-purple, its use seems to have been known by the mid Second Millennium BC with it evidently being valued as a object of worth and as a exchangeable commodity. Texts from Nuzi record that as early as 1500 BC caravans were carrying red-purple dye from the coastal cities of Syria-Phoenicia to beyond the Tigris in the east<sup>101</sup>, and by this period we see the apparent existence of a *murex* factory at Ugarit (Northern Syria) with finds of crushed shells at nearby Medinet el-Beidh. The Tell el-Amarna texts record that purple goods were exchanged between Mitanni and Egypt during the reign of Amenhotep III (1411-1375 BC).<sup>102</sup> Although the prevailing view is that it was of a Near Eastern origin, evidence has been cited in support of an early date for production within the Minoan-Mycenaean context, in fact it was suggested by Glotz<sup>103</sup> that the finds of *murex* shells on Crete so predated those further east that the initial discovery and development of the industry will have taken place here with the industry at Ugarit being under some form of Minoan influence. Large quantities of *murex* shells have been found on the island of Leuke off the coast of Crete and at Palaikastro in Eastern Crete, which are dated to the Middle Minoan II and III periods (c1900-1700/1650 BC)

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<sup>99</sup>Libanius Epistle 67.1: Ἡ που πολλάκις σοί τε καὶ τοῖς γνωρίμοις ὑπὲρ Φοινίκης γίνονται λόγοι τοῦ μὲν τὴν φύσιν τῆς γῆς ὑπερεπαινοῦντος, τοῦ δὲ τὴν κπάσιν τῶν ὥπῶν, ἑτέρου τῆς θαλάττης τὴν φόρᾶν τὴν τε ἄλλην καὶ ἀς ἧς ἢ βαφή, ἣν μηνυθῆναί φασι τὸ πρῆτον τύων τινὶ διὰ κυνὸς οὐδὲν εἰδότος ὧν ἔπραττεν. "Often I am sure, conversation takes place between your friends and you about Phoenicia: one lavishes praise upon its fertility, another on the blending of the seasons, yet another on the production of purple dye, which people say was brought accidentally to light by a dog without any idea of what it was doing." (trans. Loeb ed.).

<sup>100</sup>Palaephatus De Incred. 62, cf Reinhold, M (1970) op. cit. n. 98. I regret that I have been unable to cite the original source directly.

<sup>101</sup>cf Maisler, B (1946) "Canaan and the Canaanites" in BASOR 102 p 7.

<sup>102</sup>cf Reinhold, M (1970) op. cit. n. 98 p 12.

<sup>103</sup>Glotz, G (1925) The Aegean Civilization p 171, 177-8, cf also Lorimer, H L (1950) Homer and the Monuments p 63.

respectively.<sup>104</sup> Evidence of shell deposits come from a number of other Minoan sites although it is unclear whether or not these represent alimentation or industrial production. Although a reasonable inference, it is less clear whether or not the Minoans used purple as a status symbol, whilst its prominence in the Near East in the Fifteenth and Fourteenth Centuries BC may suggest that even if not predating that of Crete, the economic focus and scale of production lay within the Levant, and in particular Phoenicia.

Whether or not they were the discoverers, the Phoenician coastal cities, principally Tyre, soon came to dominate the production and trade of purple. In fact it was through their association with this industry that their Greek name was derived, whilst within the East they were known as Canaanites. The Elder Pliny writing a millenium later could comment that the fame of Tyre rested upon its shellfish and purple dye.<sup>105</sup> Its continued importance is reflected in Strabo's comment of the undesirability of Tyre as a place to live on account of the smell of the purple dye factories, although he adds that the quality of the dye produced was such that it made the city rich.<sup>106</sup> Even in the Late Empire the purple of Tyre and Sidon were the most highly regarded.<sup>107</sup> Similarly, Libanius cites the benefits of Phoenicia as her climate, fertility and purple dye.<sup>108</sup> The diffusion of purple from East to West occurred with the

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<sup>104</sup>cf Coldstream, J N and Huxley, G (1972) *Kythera* (London) p 37, cf also Reese, R S (1980) "Industrial Exploitation of Murex Shells: Purple Dye and Lime production at Sidi Khrebish, Benghazi (Berenice)" in *Libyan Studies* 11 p 81-2.

<sup>105</sup>Pliny NH 5.17.46: *nunc omnis eius nobilitas conchylio atque purpura constat*. "but the entire renown of Tyre now consists in a shellfish and a purple dye." (trans. Loeb ed.).

<sup>106</sup>Strabo *Geography* 16.2.23: ἠτύχησε δὲ καὶ ὑπ' Ἀλεξάνδρου πολιορκία ληφθεῖσα, ἀλλὰ τῶν τοιούτων συμφορῶν κατέστη κρείττων καὶ ἀνελάβεν αὐτὴν τῶ τε ναυτιλία, καθ' ἣν πάντων τῶν αἰεὶ κρείττους εἰσὶ κοινῶ Φοῖνικες. καὶ τοῖς πορφυρείοις, πολὺ γὰρ ἐξήτασται πασῶν ἢ Τύρια καλλίστη πορφύρα. καὶ ἡ θηρα πλησίον καὶ τὰλλα εὐπορα τὰ πρὸς βαφὴν ἐπιτήδεια. καὶ δυσδιάγωγον μὲν ποιεῖ τὴν πόλιν ἢ πολυπληθία τῶν βαφείων, πλουσίαν δὲ διὰ τὴν τοιαύτην ἀνδρείαν. "The city was also unfortunate when it was taken by siege by Alexander; but it overcame such misfortunes and restored itself both by means of the seamanship of its people in which the Phoenicians in general have been superior to all peoples of all times, and by means of their dye-houses for purple; for the Tyrian purple has proved itself by far the most beautiful of all; and the shellfish are caught near the coast; and the other things requisite for dyeing are easily got; and although the great numbers of dye-works makes the city unpleasant to live in, yet it makes the city rich through the superior skill of its inhabitants." (trans. Loeb ed.).

<sup>107</sup>SHA *Carus et Carinus et Numerianus* 21.5: *quid Tyro et Sidone tenuitate perlucidis, micantes purpura, plumandi difficultate pernobiles?* "Why of those garments from Tyre and Sidon, so fine and transparent, of gleaming purple and famed for their embroidery work?" (trans. Loeb ed.).

<sup>108</sup>Libanius *Epistle* 67.1.

expansion of Phoenician colonisation into the Western Mediterranean with evidence for *murex* factories coming from large numbers of Phoenician colonies such as Motya in Western Sicily.<sup>109</sup> The Islands of Mogador off the North African coast of modern Morocco originally formed a Phoenician colony with archaeological remains for the presence of fish salting and acquired the name *Insulae Purpuriae* on the basis of their production of Purple Dye, an industry that Pliny associates with Juba II of Mauretania (c.50 BC-AD 23).<sup>110</sup> The most important centre for dye manufacture within the Western Mediterranean may well have been the Phoenician colony of Ebusus (modern Ibiza)<sup>111</sup>, with large quantities of *murex* shells having been recovered from the site of Isla Plana. The remains of the fish salting factory at Sa Plageta (Puerto de Cabrera, Cabrera)<sup>112</sup> may possibly have been associated with this industry during the Roman period. The production of purple dye on the island was important enough to merit the presence of one of the *Procuratores Baphiorum* during the Late Empire.<sup>113</sup> This correlation between Phoenician sites associated with fish salting and dyeing is well evidenced within the Western Mediterranean sphere: *murex* shells have been found at

<sup>109</sup>pers. comm. R. Leighton.

<sup>110</sup>Pliny *NH* 6.36.201: *nec Mauretaniae insularum certior fama est: paucas modo constat esse ex adverso Autololum a Juba repertas, in quibus Gaetulicam purpuram tinguere instituerat.* "Nor is there any less certainty with regard to the report of the islands of Mauretania: it is only known for certain that a few were discovered by Juba off the coast of the Autololes, in which he had established a dyeing industry that used Gaetolian purple." (trans. Loeb ed.) cf also 6.37.203. Gaetolian purple receives notice on a number of occasions in the same source; 5.1.12: *omnes scopuli Gaetuli muricibus, purpuris.* "and all the rocks of Gaetulia explored for the murex and for purple." 9.60.127: *Tyri praecipuus hic Asiae, Meninge Africae et Gaetulo litore oceani, in Laconica Europae.* "The best Asiatic purple is at Tyre, the best African is at Meninx and on the Gaetolian coast of the Ocean, the best European in the district of Sparta." The region is also noted by Strabo *Geography* 17.3.18: *Μετὰ δὲ τὴν Σύρτιν Ζοῦχίς ἐστὶ λίμνη σταδίων τετρακοσίων στενὸν ἔχουσα εἰσπλοῦν καὶ παρ' αὐτὴν πόλις ὁμώνυμος πορφυροβαφεῖα ἔχουσα καὶ ταριχέϊας παντοδαπάς.* "After the Syrtis, one comes to Zuchis, a lake with a circuit of four hundred stadia; it has a narrow entrance, and near it is a city bearing the same name which contains dye-factories and all kinds of fish-salting establishments." cf also Horace *Epistles* 2.2.181: *vestes Gaetulo murice tinctas.* "robes dyed in Gaetolian purple." Juvenal *Satires* 8.100: *plena domus tunc omnis, et ingens stabat acervus nummorum, Spartana chlamys, conchylia Coa.* "Their houses then were all well-stored; they had piles of money, with Sparta mantles and Coan purples." (trans. Loeb ed.).

<sup>111</sup>On the Phoenician colonization of Ibiza. cf Gomez Bellard, C (1990) *La Colonizacion Fenicia de la Isla de Ibiza* Excavaciones Arqueologicas en España nº 157 (Madrid).

<sup>112</sup>cf Hernández Ravanals, M J, Cau Ontiveros, M A and Orfila Pons, M (1992) "Nuevos datos sobre el poblamiento antiguo de la isla de Cabrera (Balears). Una posible factoria de salazones" in *Saguntum* 25 p 213-222.

<sup>113</sup>*Notitia Dignitatum Occidentis* 10. Comes Sacrarum Largitionum G. Procuratores Bafiorum. 7. Procurator Bafii Insularum Balearium in Hispania.

the saltery of Kouass in N.Africa<sup>114</sup>; at Baria and Caetobriga in Southern Spain<sup>115</sup>, and the 'cothon' neighbouring the *murex* factory at Motya in Western Sicily may in fact have served as *vivarium* for the storage of fish for a neighbouring, and as yet unidentified fish saltery.<sup>116</sup> The Carthaginian dependence upon Phoenicia will have extended to an exploitation of purple; Silius Italicus tells us that Hannibal wore purple dress<sup>117</sup>, and it is probable that the use and production of purple extended through her dominions in Spain. Both Polybius and Livy record that the Spanish troops of Hannibal prior to the battle of Cannae in 216 BC as wearing purple striped tunics.<sup>118</sup> It is probable that important dye production took place within Carthago Nova, although the only evidence for *murex* processing is the find of an early Roman vessel from El Molinete that contained three kilograms of crushed shells.<sup>119</sup>

The close connection between Phoenician dyeing and salting will have meant that the former will have arrived in the Iberian peninsula with the establishment of the first Phoenician colonies, and it is probable that production continued within the areas of fish salting activity during the Roman period. We have already referred to the presence of a Roman fish saltery at Sa Plageta on the island of Cabrera and to the presence of a *Procurator Baphiorum* in Ebusus in the Late Empire. To this must be added the finds of quantities of molluscs on the villa site of La Pila (Altea, Alicante).<sup>120</sup> Seventy-five molluscs were recovered, of which the most common were the *Murex trunculus*, *Thais haemastoma* and *Murex brandaris*, which were used in the production of purple dye, which with a number of the shells having been broken during extraction

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<sup>114</sup>cf Curtis, R I (1991) op. cit. n. 30 p 65.

<sup>115</sup>cf Curtis, R I (1991) op. cit. n. 30 p 57. I regret that I have been unable to cite directly either García y Bellido, A (1942) "La industria pesquera y conserva española en la Antiquedad" in *Investigación y Progreso* 13 p 1-8, or Pellati, F (1931) "I monumenti del Portogallo romano" in *Historia* 5 p 196-217.

<sup>116</sup>For the conventional identification of the cothon at Motya as a dry dock, cf Isserlin, B J (1971) "New light on the 'cothon' at Motya" in *Antiquity* 55 p 178-186.

<sup>117</sup>Silius Italicus *Punica* 4.324: *Advolat aurato praefulgens murice ductor Sidonius*. "Now the Carthaginian leader flew to the spot, gleaming in purple and gold." (trans. Loeb ed.).

<sup>118</sup>Livy *History* 22.46.6: *Hispani linteis praetextatis purpura tunicis candore miro fulgantibus constiterant*. "the Spaniards had formed up wearing crimson-bordered linen tunics that shone with a dazzling whiteness." Polybius *History* 3.114.4: "As they were drawn up in alternate companies, the Gauls naked and the Spaniards in short tunics bordered with purple, their national dress, they presented a strange and impressive appearance." (trans. Loeb ed.)

<sup>119</sup>cf Reese, D S op. cit. n. 104 p 86.

<sup>120</sup>cf Abad Varela, M and García Pérez, M A (1992) "Estudio de los moluscos recogidos en la Villa Romana de La Pila, Altea (Alicante)" in *AEA* 65 p 318-322.

it appears that the site may have been engaged in the production of purple during the occupation of the villa from the First to Fourth Centuries AD. 59.45% of the molluscs recovered are used in the production of purple dye and of those classified as *Thais*, 37.93% bear traces of extraction. Evidently purple dye manufacture was a feature of the villa economy of this site, which raises questions as to the extent of the imperial monopoly to which we shall turn shortly. It seems likely that the bulk of production will have been concentrated in coastal areas within which there existed an established salting industry in view of the close association between the two: Strabo refers to the presence of purple dyeing at Carteia in Baetica<sup>121</sup>, unfortunately, it is impossible to qualify this as archaeological evidence for the processing of *murex* is lacking.

In view of the large quantities of molluscs required to produce purple dye: 8,000 snails are needed for just one gram of dye; one would expect plentiful traces of broken *murex* shells to be found in association with the salting installations in which they were processed, such is absent for the archaeological record and requires explanation. Two factors might explain this: the most completely studied *murex* factory is that of Berenice (Sidi Khrebish, Benghazi)<sup>122</sup> where the production of purple dye appears to have been at its peak in the period from the Third Century AD. The quantities of shells recovered from the site were found associated with poorly constructed kilns and ovens lying on the periphery of the Late Imperial town with areas of the earlier town seemingly given over to industrial activity of some form. It was suggested, therefore, that the shells were utilised for the production of lime and that the kilns found were lime kilns.<sup>123</sup> Bearing in mind the inter-relationship between pottery kilns and fish salteries, particularly in the Bay of Cadiz, the production of lime and the use of shells as temper for mortar and pottery may well have been a widespread and prevalent method of disposing of the large quantities of waste shells that accrue from the processing of dye. A second factor must also be borne in mind when considering the lack of evidence of shell middens within the archaeological record, namely Strabo's

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<sup>121</sup>Strabo *Geography* 3.2.7: ἐν δὲ Καρτηία κήρυκας δεκακοτύλους καὶ ποφύρας φασίν. "And at Carteia, it is said, there are shells of trumpet-fish and purple-fish which hold ten cotylae." (trans. Loeb ed.).

<sup>122</sup>On the excavations at Sidi Khrebish, cf Lloyd, J A (1979) *Excavations at Sidi Khrebish, Benghazi (Berenice)* 2 vols (Tripoli), cf also Reese, D S (1980) op. cit. n<sup>o</sup> 7.

<sup>123</sup>cf Reese, D S (1980) op. cit. n. 7 p 90.

comment of the unpleasantness caused by dyeing.<sup>124</sup> The shell deposits and kilns at Berenice were found beyond the confines of the Late Roman town and it may have been the norm for such activities to have been located away from the urban centre and thus beyond the primary sphere of excavation. Sadly we must also note the failure, still prevailing today, of archaeologists to recognize or record the presence of molluscs within excavations. The quest for tangible artefacts has meant that such remains are ignored with the result that any exact interpretation of the relationship between dyeing and other activities is impossible until the complete scientific excavation of sufficient numbers of relevant sites has occurred.

The widespread distribution of production sites within the sphere of Phoenician colonisation well attest to the importance of purple dye. Although dyes were relied upon to provide colouring for clothes produced from natural fibres, the natural dyes used were impermanent and prone to fade in contact with sun and water. The exception to this was *purpura*, the purple dye, itself something of a misnomer as its colour ranged from violet to light blue, which lasted particularly well on silk and wool.<sup>125</sup> Such was its repute that from an early date it became valued as an object of status and as in the mythical account of King Phoenix it came increasingly, although by no means exclusively to be associated with monarchy.

The use of purple bordered garments as a symbol both of officials and social status within the Roman Republic is well known: we have already referred to Servius

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<sup>124</sup>cf Strabo *Geography* 16.2.23 op. cit. n. 9.

<sup>125</sup>Pliny *NH* 8.74.197: *Servi Tulli praetextae quibus signum Fortunae ab eo dicatae coopertum erat, duravere ad Seiani exitum, mirumque fuit neque diffluxisse eas neque teredinum iniurias sensisse annis quingentis sexaginta.* "The state robes of Servius Tullius, with which the statue of Fortune dedicated by him was draped, lasted till the death of Seianus, and it was remarkable that they had not rotted away or suffered damage from moths in 560 years." (trans. Loeb ed.). cf also Plutarch *Alexander* 36.1-2: Αλέξανδρος δὲ Σούσων κυριεύσας παρέλαβεν ἐν τοῖς βασιλείοις τετρακισμύρια τάλαντα νομισματος, τὴν δὲ ἄλλην κατασκευὴν καὶ πολυτέλειαν ἀδιήγητον. ὅπου φασὶ καὶ πορφύρας Ἑρμιονικῆς εὐρεθῆναι τάλαντα πεντακίσχίλια, συγκειμένης μὲν ἐξ ἐτῶν δέκα δεόντων διακοσίων, πρόσφατον δὲ τὸ ἄνθος ἔτι καὶ νεαπὸν φυλαττούσης. "On making himself master of Susa, Alexander came into possession of forty thousand talents of coined money in the palace, and of untold furniture and wealth besides. Among this they say was found five thousand talents' weight of purple from Hermione, which, although it had been stored there for a hundred and ninety years, still kept its colours fresh and lively." (trans. Loeb ed.). Plutarch goes on to add that this was because honey was used in the manufacture of the purple dye, a technique that would appear to be reiterated by Vitruvius in the dye of Gaul, Pontus and Rhodes: *De Architectura* 13.1-3.

Tullius' use of a purple robe and Romulus, too, is attested as wearing a purple tunic.<sup>126</sup> According to Roman antiquarian traditions the adoption of purple by firstly the Kings and then the Consuls was traced back to the period of Etruscan dominance<sup>127</sup> with the

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<sup>126</sup>Pliny NH 9.63.136: *Purpurae usum Romae semper fuisse video, sed Romulo in trabea: nam toga praetexta et latiore clavo Tullum Hostilium e regibus primum usum Etruscis devictis satis constat.* "I notice that the use of purple at Rome dates from the earliest times, but that Romulus used it only for a cloak; as it is fairly certain that the first of the Kings to use the bordered robe and broader purple stripe was Tullus Hostilius, after the conquest of the Etruscans." Dionysius of Halicarnassus *Roman Antiquities* 2.34.2: τελευταῖος δὲ τῆς πομπῆς αὐτὸς ἐπορεύετο ἐσθῆτα μὲν ἡμφιεσμένος ἀλουργῆ, δάφνω δὲ κατεστεμμένος τὰς κόμας καὶ, ἵνα τὸ βασιλεῖον ἀχίωμα σώζῃ, τεθρίπῳ παρηκολούθει. "Romulus himself came last in the procession, clad in a purple robe and wearing a crown of laurel upon his head, and, that he might maintain the royal dignity, he rode in a chariot drawn by four horses."

<sup>127</sup>cf Dionysius of Halicarnassus *Roman Antiquities* 3.61-2: Ταύτας λαβόντες οἱ πρέσβεις τὰς ἀποκρίσεις ᾗχοντο καὶ μετ' ὀλίγας ἡμέρας παρήσαν οὐ λόγους αὐτῷ μόνον φέροντες ψιλοῦς, ἀλλὰ καὶ τὰ σύμβολα τῆς ἡγεμονίας, οἷς ἐκόσμουν αὐτοὶ τοὺς σφετεροὺς βασιλεῖς, κομίζοντες στέφανόν τε χρύσειον καὶ θρόνον ἐλεφάντινον καὶ σκῆπτρονναετον ἔχον ἐπὶ τῆς κεφαλῆς χιτῶνα τε πορφυροῦν χρυσοσημιον καὶ περιβόλαιον πορφυροῦν ποικίλον, οἷα Λυδῶν τε καὶ Περσῶν ἐφόρουσιν οἱ βασιλεῖς, πλὴν οὐ τετράγωνόν γε τῷ σχήματι, καθάπερ ἐκεῖνα ἦν, ἀλλ' ἡμικύκλιον. τὰ δὲ τοιαῦτα τῶν ἀμφιεσμάτων Ῥωμαῖοι μὲν τόγας, Ἕλληνας δὲ τηβέννας καλοῦσιν, οὐκ οἶδ' ὁπόθεν μαθόντες. Ἕλληγικὸν γὰρ οὐ φαίνεται μοι τοῦνομα εἶναι. ὡς δὲ τινες ἱστοροῦσι, καὶ τοὺς δώδεκα πελέκεις ἐκόμισαν αὐτῷ λαβόντες ἐξ ἑκάστης πόλεως ἓνα. Τυρρηγικὸν γὰρ εἶναι ἔθος δοκεῖ ἑκάστου τῶν κατὰ πόλιν βασιλέων ἓνα προηγείσθαι ῥαβδοφόρον ἅμα τῷ δέσπῳ τῶν ῥάβδων πελεκυν φέροντα. εἰ δὲ κοινῇ γίνοιτο τῶν δώδεκα πόλεων στρατεία, τοὺς δώδεκα πελέκεις ἐνὶ παραδόδοσθαι τῷ λαβόπῳ τὴν αὐτοκράτορα ἀρχὴν. οὐ μὴν ἅπαντες γε συμφέρονται τοῖς ταῦτα λέγουσιν, ἀλλὰ παλαιότερον ἐπὶ τῆς Ταρκυνίου δυναστείας πελέκεις δώδεκα πρὸ τῶν βασιλέων φέρεσθαι φαρι, καταστήσασθαι δὲ τὸ ἔθος τοῦτο Ῥωμύλον εὐθύς ἅμα τῷ παραλαβεῖν τὴν ἀρχὴν. οὐθὲν δὲ κωλύει τὸ μὲν εὖρημα Τυρρηγῶν εἶναι, χρῆσασθαι δ' αὐτῷ πρῶτον Ῥωμύλον παρ' ἐκείνων λαβόντα, κομισθῆναι δὲ Ταρκυνίῳ σὺν τοῖς ἄλλοις κόσμοις βασιλικοῖς καὶ τοὺς δώδεκα πελέκεις, ὥσπερ γε καὶ νῦν Ῥωμαῖοι τὰ σκῆπτρα καὶ τὰ διαδήματα δωροῦνται τοῖς βασιλεῦσι βεβαιοῦντες αὐτοῖς τὰς ἐχουσίας, ἐπεὶ καὶ μὴ λαβόντες γε παρ' ἐκείνων ἐχουσιν αὐτά.

Ταύταις ταῖς τιμαῖς ὁ Ταρκύνιος οὐκ εὐθύς ἐχρήσατο λαβῶν, ὡς οἱ πλείστοι γράφουσι τῶν Ῥωμαϊκῶν συγγραφέων, ἀλλ' ἀποδοὺς τῷ τε βουλῷ καὶ τῷ δήμῳ τὴν διαγνώσιν εἰ ληπτέον αὐτάς, ἐπειδὴ πᾶσι βουλομένοις ἦν, τότε προσεδέξατο καὶ πάντα τὸν ἐξ ἐκείνου χρόνον ἕως εἰς τὸ χρεῶν μετέστη στέφανόν τε χρύσειον ἐφόρει καὶ πορφυρᾶν ἐσθῆτα ποικίλην ἡμίσχετο καὶ σκῆπτρον ἐλεφάντινον ἔχων ἐπὶ θρόνου ἐκαθέζετο ἐλεφάντινου, καὶ οἱ δώδεκα ῥαβδοῦχοι τοὺς πελέκεις φέροντες ἅμα ταῖς ῥάβδοις δικάζοντι τὴν αὐτῷ παρίσταπτο καὶ πορευομένου προηγούντο. οὗτος ὁ κόσμος ἅπας καὶ τοῖς μετ' ἐκείνον τὴν βασιλικὴν ἀρχὴν ἐχουσι παρέμεινε καὶ μετὰ τὴν ἐκβολὴν τῶν βασιλέων τοῖς κατ' ἐνιαυτὸν ὑπατοῖς ἐξω τοῦ στέφανου καὶ τῆς ποικίλης ἐσθῆτος. ταῦτα δ' αὐτῶν ἀφπρεθῆ μόνα φορτικὰ δόξαντα ὠῖπαι καὶ ἐπίφθονα. πλὴν ὅταν ἐκ πολέμου νίκην καταγόντες θριδύμβου παρὰ τῆς βουλῆς ἀξιωθῶσι, τότε καὶ χρυσοφοροῦσι καὶ ποικίλαις ἀλουργίσις ἀμφιέννυνται. ὁ μὲν οὖν πρὸς τοὺς Τυρρηγῶν συστὰς Ταρκυνίῳ πόλεμος ἔτη κατασχῶν ἑννέα τοιαύτην ἔσχε τὴν συπτελειαν. "The ambassadors, having received this answer, departed, and after a few days returned, not merely with words alone, but bringing the insignia of sovereignty with which they used to decorate their own kings. these were a crown of gold, an ivory throne, a sceptre with an eagle perched on its head, a purple tunic decorated with gold, and an embroidered purple robe like those the kings of Lydia and Persia used to wear, except that it was not rectangular in shape like theirs, but semicircular. This kind of robe is called *toga* by the Romans and *tēbenna* by the Greeks; but I do not know where the Greeks learned the name, for it does not seem to me to be a Greek word. And according to some historians they also

use of the purple-bordered *toga praetexta* and the *latus clavus* continuing from this date. Dionysius of Halicarnassus records that the elevation of Cincinnatus to the Dictatorship in 458 BC was marked by his receipt of purple robes and twenty-four rods and axes.<sup>128</sup> The use of purple within Rome was not, however, limited to its use as a symbol of office and with the opening up of Rome to Hellenistic ideas and culture in the Third Century BC we begin to see its use as a symbol of affluence. The turning point seems to have been reached with the repeal of the Oppian Law in 195 BC. This was a sumptuary measure introduced at the height of the Second Punic War in 215 BC that attempted to limit excessive luxury by stopping women from owning more than half an ounce of gold, wearing purple trimmed dresses or from riding in a carriage within Rome itself or towns inside a radius of a mile thereof.<sup>129</sup> Despite the curtailments

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brought to Tarquinius the twelve axes, taking one from each city. For it seems to have been a Tyrrhenian custom for each king of the several cities to be preceded by a lictor bearing an axe with a bundle of rods, and whenever the cities undertook any joint military expedition, for the twelve axes to be handed over to the one man who was invested with absolute power. However, not all the authorities agree with those who express this opinion, but some maintain that even before the reign of Tarquinius twelve axes were carried before the kings of Rome and that Romulus instituted this custom as soon as he received the sovereignty. But there is nothing to prevent our believing that the Tyrrhenians were the authors of this practice, that Romulus adopted its use from them, and that the twelve axes also were brought to Tarquinius together with the other royal ornaments, just as the Romans even today give sceptres and diadems to kings in confirmation of their power; since, even without receiving those ornaments from the Romans, these kings make use of them.

Tarquinius, however, did not avail himself of these honours as soon he received them, according to most of the Roman historians, but left it to the senate and people to decide whether he should accept them or not; and when they unanimously approved, he then accepted them and from that time till he died always wore a crown of gold and an embroidered purple robe and sat on a throne of ivory holding an ivory sceptre in his hand, and the twelve lictors, bearing the axes and rods, attended him when he sat in judgement and preceded him when he went abroad. All these ornaments were retained by the kings who succeeded him, and, after the expulsion of the kings, by the annual consuls—all except the crown and the embroidered robe: these alone were taken from them, being looked upon as vulgar and invidious. Yet whenever they return victorious from a war and are honoured with a triumph by the senate, they not only wear gold but are also clad in embroidered purple robes. This, then, was the outcome of the war between Tarquinius and the Tyrrhenians after it had lasted nine years." (trans. Loeb ed.).

<sup>128</sup>Dionysius of Halicarnassus *Roman Antiquities* 10.23.2: ὡς δ' ἐγγύς ἦν, ἵππους τ' αὐτῷ φαλάροις κεκοσμημένους ἐκπέπεσι προσήγον καὶ πελέκεις ἅμα ταῖς ῥάβδοις εἰκοσιτέτταρας παρέστησαν ἐσθῆτα τε ἀλουργῆ καὶ τᾶλλα παράσημα οἷς πρότερον ἢ τῶν βασιλέων ἐκεκόσμητο ἀρχὴ προσήνεγκαν. "When he drew near, they brought to him horses decked with magnificent trappings, placed beside him twenty-four axes with the rods and presented to him the purple robe and the other insignia with which aforetime the kingly office had been adorned." (trans. Loeb ed.).

<sup>129</sup>Livy *History* 34.1.3: *Tulerat eam C. Oppius tribunus plebis Q. Fabio Ti. Sempronio consulibus, in medio ardore Punici belli, ne qua mulier plus semunciam auri haberet neu vestimento versicolori uteretur neu iuncto vehiculo in urbe oppidove aut propius inde mille passus nisi sacrorum publicorum causa veheretur.* "The tribune C. Oppius had carried this law in the heat of the Punic war, in the consulship of Q. Fabius and Tib. Sempronius, that no woman should possess more than half an ounce

of this legislation, the use of purple was widespread and is reflected in the words of the tribune Valerius:

*Purpura viri utemur, praetextati in magistratibus, in sacerdotiis; liberi nostri praetextis purpura togis utentur; magistratibus in coloniis municipiisque, hic Romae infimo generi, magistris vicorum, togae praetextae habendae ius permittemus, nec ut vivi solum habeant tantum insigne, sed etiam ut cum eo crementur mortui...?*<sup>130</sup>

Despite the opposition of Cato the law was repealed opening the way for the large-scale use of purple amongst the upper classes of late Republican Rome. In 50 BC, for example, Favonius could condemn the use of gold, silver and purple banqueting couches<sup>131</sup>, whilst the Younger Cato, feeling the fashionable use of reddish purples to be a degeneracy, slavishly stuck to wearing darker shades of purple.<sup>132</sup> Metellus Pius, whilst campaigning in North Africa, took to wearing a purple cloak, a feature that was viewed as an impingement of royal rights by his opponent, Juba.<sup>133</sup> The value given to purple dye is reflected in the high prices recorded by the Elder Pliny, who tells us that in the early First Century BC a pound of purple would cost 100 denarii, whilst Tyrian

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of gold or wear a parti-coloured garment or ride in a carriage in the City or in a town within a mile thereof, except on the occasion of a religious festival." (trans. Loeb ed.).

<sup>130</sup>Livy *History* 34.6.2-3: "Shall we men wear purple and walk clad in the *toga praetexta* while holding priesthoods and offices? Shall our sons wear togas bordered with purple? Shall officials in the colonies and the municipal towns, and here in Rome, the ward-masters, the lowest official rank, be allowed to wear the *toga praetexta*, and enjoy so great a distinction not only during life, but even after death be burned with it...?" (trans. Loeb ed.).

<sup>131</sup>Aulus Gellius 15.8.2: *quando stratus lectus auro, argento, purpura amplior aliquot hominibus quam dis immortalibus adornatur?* "when the couch is more profusely adorned with gold, silver and purple for a few mortals than for the immortal gods?" (trans. Loeb ed.).

<sup>132</sup>Plutarch *Cato the Younger* 6.3: Καθόλου δὲ τοῖς τότε βίοις καὶ τοῖς ἐπιτηδεύμασιν ὁ Κάτων τὴν ἐναντίαν ὁδὸν οἰόμενος δεῖν βαδίζειν, ὡς οὐσι φαύλοις καὶ μεγάλης δεομένοις μεταβολῆς, ἐπεὶ πορφύραν ἔώρα τὴν κατακόρως ἐρυθρὰν καὶ ὄξειαν ἀγαπωμένην, αὐτὸς ἐφόρει τὴν μελαίναν. "And, in general, Cato thought he ought to take a course directly opposed to the life and practices of the time, feeling that these were bad and in need of great change. For instance, when he saw that a purple which was excessively red and vivid was much in vogue, he himself would wear the dark shade." (trans. Loeb ed.).

<sup>133</sup>Caesar *De Bello Africo* 57: *Namque cum Scipio sagulo purpureo ante regis adventum uti solitus esset, dicitur Iuba cum eo egisse non oportere illum eodem vestitu atque ipse uteretur.* "For Scipio had been in the habit of wearing a purple cloak before the king arrived; and Juba- so it is said- took the matter up with him, saying that Scipio ought not to wear the same dress as he himself wore." (trans. Loeb ed.).

purple could not be brought for less than 1000 denarii per pound.<sup>134</sup> Athenaeus is led to comment that purple was valued as much as its equivalent weight in silver.<sup>135</sup> A similar comment is ascribed to the emperor Aurelian: *et cum ab eo uxor sua peteret, ut unico pallio blatteo serico uteretur, ille respondit, 'Absit ut auro fila pensentur.'*<sup>136</sup> Such a high price could only have been maintained by the upper classes and it is in this that we see the principal curtailing factors on the use of purple dye, not any legislated restriction, but rather one based upon economic means and fashion. A consequence of this has been the association of the use of purple with Eastern luxury and the moral degeneracy and weakness of Rome, as Pliny the Elder so succinctly puts it: *sed quid haec tam parva commemoro, cum populatio morum atque luxuria non aliunde maior quam e concharum genere proveniat?*<sup>137</sup>

With the onset of empire we see the restoration of the Hellenistic association of purple with the concept of monarchy.<sup>138</sup> Although using such symbols in a disguised, and ostensibly Republican form, Caesar is described as being seated on a golden throne and wearing purple robes on the occasion that he was offered the diadem by Marcus

<sup>134</sup>Pliny *NH* 9.63.137: *Nepos Cornelius, qui divi Augustus principatu obiit: 'Me,' inquit, 'iuvene violacea purpura vigebat, cuius libra denariis centum venibat, nec multo post rubra Tarentina. huic successit dibapha Tyria, quae in libras denariis mille non poterat emi.* "Cornelius Nepos, who died in the principate of the late lamented Augustus, says: 'In my young days the violet purple dye was the vogue, a pound of which sold at 100 denarii; and not much later the red purple of Taranto. This was followed by the double-dyed Tyrian purple, which it was impossible to buy for 1000 denarii per pound.'" (trans. Loeb ed.).

<sup>135</sup>Athenaeus *Deipnosophistae* 12.526: ἰσοστάσιος γὰρ ἦν ἡ πορφύρα πρὸς ἄργυρον ἐξεταζομένη. "For purple was reckoned as equivalent to its weight in silver." (trans. Loeb ed.).

<sup>136</sup>SHA *Divus Aurelianus* 45.5: "and when his wife besought him to keep a single robe of purple silk, he replied, 'God forbid that a fabric should be worth its weight in gold.'" (trans. Loeb ed.).

<sup>137</sup>Pliny *NH* 9.53.104: "But why do I mention these trifles when moral corruption and luxury spring from no other source than from the genus shellfish?" cf also Dio Chrysostom *Orations* 34.29-30: τὸ δὲ μέγιστον, διὰ μὲν τὸ βέλτιστον καὶ τῆς πατρίδος αὐτῆς ἐνεκεν οὐ, λοιπὸν δὲ διὰ δόξας καὶ τιμᾶς καὶ τὸ δύνασθαι πλεον ἐτέρου καὶ στεφάνους καὶ προεδρίας καὶ πορφύρας διώκοντες, πρὸς ταῦτα ἀποβλέποντες καὶ τούτων ἐξηρημένοι τοιαῦτα πράττουσι καὶ λέγουσιν, ἐξ ὧν αὐτοὶ τινες εἶναι δόξουσιν. "And what is the most serious is that these men, not for the sake of what is truly best and in the interest of their country itself, but for the sake of reputation and honours and the possession of greater power than their neighbours, in the pursuit of crowns and precedence and purple robes, fixing their gaze on these things and staking all upon their attainment, do and say such things as will enhance their own reputations. Consequently one may see in every city many who have been awarded crowns, who sacrifice in public, who come forth arrayed in purple." (trans. Loeb ed.).

<sup>138</sup>We shall limit ourselves here to providing a number of examples of the association of purple with the Imperial house, restrictive legislation will be dealt with when we turn to the state of the monopoly of purple dye manufacture later in this appendix.

Antonius.<sup>139</sup> The precedent thus established was further exploited by his Imperial successors, although with due deference to Republican traditions. Suetonius records that the client king Ptolemy of Mauretania was put to death by the emperor Gaius for usurping the Imperial use of purple robes.<sup>140</sup> Upon the death of Commodus, his personal goods were sold off by his successor Pertinax and were said to have included purple cloaks.<sup>141</sup> It is from this period onwards that we see the increasing association of purple with the Imperial insignia<sup>142</sup>, a process that perhaps reaches its peak with the autocracy of Diocletian with the Emperor's adoption of a more oriental style of dress.<sup>143</sup> It is reflected in Lactantius' comment: *nunc Romanis indumentum purpurae insigne est regiae dignitatis assumptae*.<sup>144</sup> The term purple was now to be considered synonymous with the person of the Emperor and is reflected in the institution of the

<sup>139</sup>cf Pliny NH 11.71.186: *Caesari dictatori, quo die primum veste purpurea processit atque in sella aurea sedit*. "On the day when Caesar as dictator first went in procession dressed in purple and took his seat on a golden throne." Plutarch Antony 12.1: Καίσαρ δὲ κεκοσμημένος ἐσθῆτι θριαμβικῇ καὶ καθήμενος ὑπὲρ βήματος ἐν ἀγορᾷ τοῦς διαθέοντας εθεάτο. "Caesar, arrayed in a triumphal robe and seated in the forum upon the rostra, was viewing the runners to and fro." Dio Cassius Roman History 44.6.1: ὡς δὲ καὶ τούτοις ἔχαιρε, δίφρος τε οἱ ἐπίχρυσος, καὶ στολὴ π ποτε οἱ βασιλῆς ἐκέχρητο, φρουρά τε ἐκ τῶν ἰππέων καὶ ἐκ τῶν βουλευτῶν ἐδόθη. "As he seemed to like all this, a gilded chair was granted him, and a garb that the kings had once used, and a body-guard of knights and senators." Cicero Philippic 2.34.85: *Sedebat in rostris conlega tuus amictus toga purpurea in sella aurea coronatus*. "Your colleague [Caesar] was seated on the rostra, clad in a purple gown, on a golden chair, with a wreath." (trans. Loeb ed.).

<sup>140</sup>Suetonius Caligula 35: *Ptolemaeum, de quo rettuli, et arcessitum e regno et exceptum honorifice, non alia de causa repente percussit, quam quod edente se munus ingressum spectacula convertisse hominum oculos fulgore purpureae abollae animadvertit*. "After inviting Ptolemy, whom I have mentioned before, to come from his kingdom and receiving him with honour, he suddenly had him executed for no other reason than that when giving a gladiatorial show, he noticed that Ptolemy on entering the theatre attracted general attention by the splendour of his purple cloak." (trans. Loeb ed.). Various alternative explanations have been given for the murder, such as the wealth of the province and the desirability of its acquisition, however, it may be that Ptolemy's abuse of Augustan traditions concerning the use of purple, although trivial may have been sufficient provocation for the unstable Gaius, cf Balsdon, J P V D (1934) The Emperor Gaius (Oxford) p 192-3, cf also Barrett, A A (1990) Caligula: the corruption of power (Oxford) p 117-118.

<sup>141</sup>SHA Pertinax 8.2: *purpureasque chlamydes Graecanicas atque castrenses*. "purple cloaks made in the Greek fashion, and purple cloaks made for service in the camp." (trans. Loeb ed.). cf also Garzón Blanco, J A (1990) El Emperador Publio Helvio Pertinax y la transformacion politica del año 193 (Málaga) p 36-37.

<sup>142</sup>cf Reinhold, M (1970) op. cit. n. 98 p 59.

<sup>143</sup>cf Eutropius 9.26: "He put ornaments of precious stones on his dress and shoes, when the Imperial distinction had previously been only in the purple robe, the rest of the habit being the same as that of other men." (trans Watson, J S (1882) Bohn's Library, London). Ammianus Marcellinus 14.11.10: *Galerius purpuratus*. "Galerius, clad in purple." 16.8.4: *et fingere quod velamen purpureum, a Diocletiani sepulcro furatus, quibusdam consociis occultabat*. "and to allege that he had stolen a purple robe from Diocletian's tomb and with several accomplices was concealing it." (trans. Loeb ed.).

<sup>144</sup>Lactantius Divinae Institutiones 4.7.

*adoratio purpurae*. Its use, however, was not limited purely to the Imperial household and in fact Severus Alexander receives note in the *Historiae Augustae* for his failure to wear purple.<sup>145</sup> We shall deal with the evidence pertaining to the trading of purple later in the chapter suffice it to say that it seems to have been a freely tradeable commodity through to the Byzantine period. Both under Severus Alexander and Aurelian we hear of the use of purple by matrons<sup>146</sup> whilst its private use seems to have been unlimited<sup>147</sup>- its wide popularity, and as we shall see later, its cheapness, suggests that a wide range of different types of purple dye were utilised, thus providing a widely produced and available commodity.

Purple dye, in its role as a symbol of status and power, acquired an importance second to none in the ancient world. Yet its use was not limited, beyond the economic criteria of availability and purchasing capacity. Thus it came to be increasingly in vogue within the Roman world with apparently an ever increasing market for its use both with in private terms with the increasing display of affluence upon the part of the aristocracy, and with the public requirements of the ever-growing imperial bureaucracy. It, therefore, formed a potential economic market of great importance- the exploitation of which, as we have already seen was enough to provide the key to the wealth and prosperity of ancient Tyre. This potential clearly did not abate with the onset of the Roman period, in fact with the widening of the aristocratic marketplace open to the use of purple, we see a dramatic increase in its use and potential earnings. The increased requirements went beyond the scale of the pre-Roman dyeing industry and encouraged

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<sup>145</sup>SHA *Severus Alexander* 40.10-11: *boni linteaminis adpetitor fuit, et quidem puri dicens: 'Si lineae idcirco sunt ut nihil asperum habeant, quid opus est purpura in linea?'* "He was always eager to get good linen, without any purple in it, for he used to say, 'If these garments are made on linen in order to prevent their being rough, what is the use of having purple in the linen?'" (trans. Loeb ed.).

<sup>146</sup>SHA *Severus Alexander* 40.6: *purpurae clarissimae non ad usum suum sed ad matronarum, si quae aut possent aut vellent, certe ad vendendum gravissimus exactor fuit, ita ut Alexandriana purpura hodieque dicatur quae vulgo Probianae dicitur, idcirco quod Aurelius Probus baphiis praepositus id genus muricis repperisset.* "He would always insist of having purple of the brightest hue, not for his own use but for that of matrons. in case they were eager or able to have it, and in any case with a view to having it put on sale; and even today that purple is still called Alexandrian, which is commonly spoken of as Probian merely because Aurelius Probus, the superintendent of the dye-works, invented this kind of dye." *Divus Aurelianus* 46.4: *idem concessit, ut blatteas matronae tunicas haberent et ceteras vestes, cum antea coloreas habuissent et ut multum oxypaederotinas.* "He also allowed matrons to have tunics and other garments of purple, whereas before they had had only fabrics of changeable colours, or, as frequently, of an opal-hue." (trans. Loeb ed.).

<sup>147</sup>cf Reinhold, M (1970) op. cit. n. 98 p 53-55, 57.

the establishment of wider fields of production. The pre-existing Phoenico-Roman production in Spain, Sicily, North Africa and so forth will have been in a position to exploit this boom in demand, and as such it will have formed an important supplement to the production of salted fish, an industry with which, as we shall now see, the production of purple dye was closely related in processing and manufacture, and one which will have been well placed to exploit the demand for purple dye.

## 6. METHODS OF PRODUCTION AND THEIR RELATIONSHIP TO FISH SAUCE

We have already referred to the very limited archaeological evidence for the production of purple dye and of the reasons for this, however, what should be clear from our earlier comments is the relationship between the evidence of salt fish production and the processing of *murex*. We will now discuss in more detail the evidence that exists for the manufacture of purple dye and attempt to show the close similarities that exist between the manufacturing techniques of purple dye and salt fish and thus to suggest that production of both was to be found in the same installations through the different periods of the year.

The fullest account of the processing of purple dye comes from the Elder Pliny. According to Pliny the molluscs were first caught in baited wicker baskets. Upon removal from the sea, the flesh containing the dye gland was removed either by piercing or crushing the protective shell- hence the attested finds of *murex* shells as evidence of such manufacturing processes. One of the primary concerns seems to have been to extract the dye gland whilst the animal was still alive so as to prevent its drying up.<sup>148</sup> From here the flesh is mixed with salt and placed in vats to macerate in the sun for a period of days:

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<sup>148</sup>Aristotle *Historia Animalium* 5.15.547a.26-8: σπουδάζουσι δὲ ζώσας κόπτειν. εἴαν γὰρ πρότερον ἀποθάνω, συνεξεμίει τὸ ἄνθος. διὸ καὶ φυλάττουσιν ἐν τοῖς κύρτοις, ἕως ἄν ἀθροίσωσι καὶ σχολάσωσιν." "They make every effort to break them up while they are alive, because if they die before this is done, they vomit the bloom out, and that is why they keep them in weels until they have collected a fair number of them and have leisure to deal with them." Pliny *NH* 9.60.126: *vivas capere contendunt, quia cum vita sucum eum evomunt*. "People strive to capture this fish alive, because it discharges this juice with its life." (trans. Loeb ed.).

*Eximitur postea vena quam diximus, cui addi salem necessarium, sextarios ferme centenas in libras; macerari triduo iustum, quippe tanto maior vis quanto recentior, fervere in plumbo, singulasque amphoras aquae, quinguagenas medicaminis libras aequali ac modico vapore torreri adducto longinquae fornacis cunciulo. ita despumatis subinde cerinbus quas adhaesisse venis necesse est, decimo ferme die liquata cortina vellus elutriatum mergitur in experimentum et, donec spei satis fiat, uritur liquor.<sup>149</sup>*

From this account we can see four essential criteria in which the production of purple dye could be identified with that of salted fish: firstly, the need for a coastal location: the molluscs are found in coastal regions<sup>150</sup>, whilst the extraction of the dye glands required them to be kept alive in sea-water until such a time as sufficient

<sup>149</sup>Pliny *NH* 9.62.133: "Subsequently the vein of which we spoke is removed, and to this salt has to be added, about a pint for every hundred pounds; three days is the proper time for it to be steeped (as the fresher the salt the stronger it is), and it should be heated in a leaden pot, and with 50 lbs of dye to every six gallons of water kept at a uniform and moderate temperature by a pipe brought from a furnace some way off. This will cause it gradually to deposit the portions of flesh which are bound to have adhered to the veins, and after about nine days the cauldron is strained and a fleece that has been washed clean is dipped for a trial, and the liquid is heated up until fair confidence is achieved." (trans. Loeb ed.). cf also Pollux *Onomasticon* 1.47-9, Aristotle *Historia Animalium* 5. 15. For the methods of catching the shell-fish: cf Pliny *NH* 9.61.132: *capuntur autem purpurae parvulis rarisque textu veluti nassis in alto iactis. inest his esca, clusiles mordacesque conchae, ceu mitulos videmus. has semineces sed redditas mari avido hiatu reviviscentes appetunt purpurae porrectisque linguis infestant. at illae aculeo extimulatae claudunt sese comprimuntque mordentia. its pendentes aviditate sua purpurae tolluntur.* "Purples are taken in a sort of little lobster-pot of fine ply thrown into deep water. These contain bait, cockles that close with a snape, as we observe that mussels do. These when half-killed but put back into the sea gape greedily as they revive and attract the purples, which go for them with outstretched tongues. But the cockles when pricked by their spike shut up and nip the creatures nibbling them. So the purples hang suspended because of their greed and are lifted out of the water." Aristotle *Historia Animalium* 5.15.547a.28-33: οἱ μὲν οὖν ἀρχαῖοι πρὸς τοῖς δελεάσιν οὐ καθιέσαν οὐδὲ προσῆπτον τοὺς κύρτους, ὥστε συνέβαινεν ἀνεσπασθηενην ἤδη πολλακίς ἀποπίπτειν. οἱ δὲ νῦν προσάπτουσιν, ὅπως ἂν ἀποπέσω, μὴ ἀπολλύηται. "In former times they did not let down weels with the bait nor fasten them on, with the result that the animal frequently dropped off after being pulled up; but present day fishermen do fasten them on, so that if the animal falls off it is not lost." (trans. Loeb ed.).

<sup>150</sup>Aristotle *Historia Animalium* 5.15.547a.7-12: καὶ αἱ μὲν ἐν τοῖς κόλποις μεγάλαι καὶ τραχεῖαι, καὶ τὸ ἄνθος αὐτῶν αἱ μὲν πλείσται μελάν ἔχουσιν, ἔνια δ' ἐρυθρὸν καὶ μικρόν. γίνονται δ' ἔνια τῶν μεγάλων καὶ μναῖαι. αἱ δ' ἐν τοῖς αἰγιαλοῖς καὶ περὶ τὰς ἀκτὰς τὸ μὲν μέγεθος γίνονται μικραῖ, τὸ δ' ἄνθος ἐρυθρὸν ἔχουσιν. "Those found in bays are large and rough, and in most of these the bloom is dark-coloured, though in some it is red and small. Some of the large ones attain a weight of one mina. Those found on beached and along rocky coasts are small in size, and their bloom is red." (trans. Loeb ed.).

quantities had been caught to enable processing to continue.<sup>151</sup> Secondly, the flesh required the addition of large quantities of salt during the process of fermentation-quantities of 1.5 lbs of salt for every 100 lbs of flesh being prescribed by Pliny. Thirdly, the maceration and decomposition of the mixture under contact with sunlight required its placement in open air vats for a period of several days. Finally, Pliny refers to the use of heat in encouraging the decomposition of the flesh-salt mixture, a feature that will recall the quicker method of *garum* production recorded by the *Geoponica* and discussed earlier in this thesis.<sup>152</sup> These points suggest a clear correlation between the two methods of production, and alone would suggest that the processing of the two might have operated interdependently. Two further considerations must, however, also be cited in support of this view. Firstly, as we have mentioned earlier in this chapter, the introduction of purple dye manufacture into the Iberian peninsula was a Phoenician innovation, as in fact was that of fish salting, again as we have discussed before. Both industries have been found located in areas of Phoenician influence and finds of *murex* shells are attested on a number of fish salting installations. It seems, therefore, reasonable to suggest that the introduction of both to the Iberian peninsula by the Phoenicians was an interrelated one and that their production went hand in hand. Secondly the two seasons of production complement each other and thus would enable the operation of such installations to continue at a productive level throughout the year. Whereas fish salting seems to have been at its most active during the late spring/early summer and late summer/early autumn periods, that of purple dye production was centred within winter and spring<sup>153</sup>, times that otherwise would have been inactive if production was merely centred in that of salted fish. Considerations of manpower may also have been included. It is, therefore, to be concluded that the production both of purple dye and of salted fish occurred within the economic horizons and calendar of the

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<sup>151</sup>cf Aristotle *Historia Animalium* 5.15.547a.26-8.

<sup>152</sup>cf chapter 2.

<sup>153</sup>Pliny NH 9.62.133: *Capi eas post canis ortum aut ante vernum tempus utilissimum, quoniam, cum cerificavere, fluxos habent sucos.* "It is most profitable for them to be taken after the rising of the dog-star or before spring-time, since when they have waxed themselves over with slime, they have their juices fluid." Aristotle *Historia Animalium* 5.15.547a.13-15: ἀλίσκονται δὲ τοῦ ἔαρος, ὅταν κηριάζωσιν. ὑπὸ κύνα δ' οὐχ ἀλίσκονται. οὐ γὰρ νέμονται, ἀλλὰ κρύπτουσιν ἑαυτὰς καὶ φωλεύουσιν. "They are caught in spring-time, when they are honeycombing, but they are not caught during the dog-days, because then they do not feed but hide themselves away in holes." (trans. Loeb ed.).

same sites and were economically interdependent. The close similarities between the two methods of production, combined with the available profits from the processing of purple dye will have made such a conjunction at least economically desirable, and considering the limited yearly operation of each industry, perhaps even a necessity.

Edmondson, has however, raised a number of points that merit mention.<sup>154</sup>In his description of the processes involved in the production of dye, Pliny describes the dipping of a fleece into the purple: *decimo ferme die liquata cortina vellus elutriatum mergitur in experimentum et, donec spei satis fiat, uritur liquor. rubens color nigrante deterior. quinis lana potat horis rursusque mergitur carminata, donec omnem ebibat saniam.*<sup>155</sup> Evidently the dye will not have been transported in its raw form, rather the production of dyed fabrics occurred on site. In this case we would expect to find evidence of fabric production and fulling within the immediate area of the dyeing installation. As yet there is no archaeological evidence in support of this although the excavation of urban factories such as those of Baelo (Bologna) in Southern Spain may throw light upon this question. The find of agricultural tools in the villa adjoining the fish factory at Calpe<sup>156</sup> may suggest such a relationship with the agricultural hinterland, one that may have been more widespread than the archaeological evidence permits us to suspect considering the frequent association of Eastern Tarraconensian factories with villas. Certainly the Lusitanian town of Salacia (Alcácer do Sal) has produced archaeological evidence of fish salting as well having been noted in ancient times for its fabrics.<sup>157</sup>

As we have mentioned earlier, the identification of the use of molluscs also presents problems, and it is on this basis that Edmondson has suggested that the finds of *murex* in association with fish salting installations may not reflect the processing of purple dye, but rather the use of molluscs in the manufacture of fish sauces: *sic allex*

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<sup>154</sup>Edmondson, J C (1987) Two Industries in Roman Lusitania: Mining and Garum Production BAR Int. Ser. 362 (London), cf esp. p 120-1.

<sup>155</sup>Pliny NH 9.62.133-134: "and after about nine days the cauldron is strained and a fleece that has been washed clean is dipped for a trial, and the liquid is heated up until fair confidence is achieved. A ruddy colour is inferior to a blackish one. The fleece is allowed to soak for five hours and after it has been carded is dipped again, until it soaks up all the juice." (trans. Loeb ed.).

<sup>156</sup>cf Gorges, J G (1979) Les Villas Hispano-Romaines (Paris).

<sup>157</sup>Strabo Geography 3.2.6: ὑπερβολῆ δὲ καὶ τῶν λεπτῶν ὑφασμάτων, ἅπερ οἱ Σαλακιῆται κατασκεύζουσιν. "Surpassing, too, are the delicate fabrics which are woven by the people of Salacia." (trans. Loeb ed.)

*pervenit ad ostreas, echinos, urticas maris, mullorum iocinera, innumerisque generibus as saporis gulae coepit sal tabescere.*<sup>158</sup> This would bear out the variable range of molluscs that are attested on sites of fish factories<sup>159</sup> and their use as food is well known from the Mesolithic period onwards. However, Pliny appears to be associating the production of *allex* from molluscs with that of 'kosher' fish-sauces produced in the Levant<sup>160</sup>, in which case the production of such will not have been prevalent within the Iberian Peninsula. Certainly, molluscs were utilised as a source of food, however, the relative availability of fish will have made their use in the production of salt fish sauces less prevalent, whilst the potential profits to be made from the expanding market for purple dye will have meant that their use for other, less profitable goods would have been economically unlikely.

It seems probable, therefore, that some production of purple dye will have taken place in conjunction with the processing of fish sauces with the seasonality of the two techniques making such an easy opportunity. The utilisation of the same installations for both products points to there being a combination of interests between the two, an hypothesis that raises the precise nature of the monopoly on purple dye production into question, and it is to this that we shall now turn our attention.

## 7. THE IMPERIAL MONOPOLY

Earlier in this chapter we devoted some space to the question of the role of purple dye in the Ancient World, in which we attempted to show that although increasingly used as a symbol of monarchy, its use was never exclusively confined to such and that it continued as an indicator of wealth and prestige amongst the upper

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<sup>158</sup>cf Pliny *NH* 31.44.95: "Thus *allex* has come to be made from oysters, sea urchins, sea anemones, and mullet's liver, and salt to be corrupted in numberless ways so as to suit all palates." (trans. Loeb ed.).

<sup>159</sup>cf Fernandez Ochoa, C (1994) *Una Industria de Salazones de Epoca Romana en la Plaza del Marques* Excavaciones Arqueologicas en la Ciudad de Gijon (Gijon).

<sup>160</sup>Pliny *NH* 31.44.95: *aliud vero ... castimoniarum superstitioni etiam sacrisque Iudaeis dicatum, quod fit e piscibus squama carentibus. sic allex pervenit ad ostreas, echinos, urticas maris, mullorum iocinera, innumerisque generibus ad saporis guale coepit sal tabescere.* "But another kind [of *garum*] is devoted to superstitious sex-abstinence and Jewish rites, and is made from fish without scales. Thus *allex* has come to be made from oysters, sea urchins, sea anemones, and mullet's liver, and salt to be corrupted in numberless ways so as to suit all palates." (trans. Loeb ed.). On Jewish fish sauces, cf Sperber, D (1968) "Some observations of Fish and Fisheries in Roman Palestine" in *Zeitschrift der Deutschen Morgenlandischen Gesellschaft* 118 p 265-269. cf also Corcoran, T H (1958) "Pliny's *Garum Castimoniarum*" in *Classical Bulletin* 34 p 69.

classes until the Late Antique period. I would now like to discuss the legal status of purple and, in the light of the evidence just propounded for the joint operation of fish salting and purple dye manufacture, to suggest that the Imperial monopoly on purple dye was not as wide ranging or as total as we have previously believed. Although we see, as with the use of purple itself, an increased concentration of control of purple dye production within State hands, similar processes were at work more widely within the Late Roman economy, and that much production will have remained in private control.

During the Hellenistic period we have no evidence of legislation restricting the use or production of purple: the earliest possible enactment in this regard may be that of Demetrius II Nicanor's conferment of purple robes on Simon, son of Mattathias as Jewish high priest.<sup>161</sup> The Oppian Law of 215 BC, to which we have already referred, seems to have been the earliest attempt to limit the use of purple in Rome, although it clearly seems to have been a temporary measure of war-time expediency being repealed in 195 BC.<sup>162</sup> The earliest concerted attempt to impose controls upon the use of purple occurs with the reinstatement of purple as a 'monarchical' symbol by Caesar in the middle of the First Century BC. Caesar's legislation was, however, severely limited, merely restricting the wearing of garments dyed with sea-purple on specific days of the year and by specific groups of people.<sup>163</sup> More problematic is Dio Cassius' record of legislation instituted by Octavian to limit the wearing of purple to senators holding magistracies.<sup>164</sup> Meyer Reinhold<sup>165</sup> believes that little credence can be attached to Dio's

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<sup>161</sup>I Maccabees 4.23; 10.20; 10.62. 64; 11.47; 14.41-45; II Maccabees 4.38, cf Reinhold, M (1970) op. cit. n. 98 p 35-6.

<sup>162</sup>Livy History 34.1.3.

<sup>163</sup>Suetonius Caesar 1.44.2: *Lecticarum usum, item conchyliatae vestis et margaritarum nisi certis personis et aetatibus perque certos dies ademit.* "He denied the use of litters' and the wearing of scarlet robes or pearls to all except those of a designated position and age, and on set days." (trans. Loeb ed.). Reinhold, M (1970) op. cit. n. 98 p 45-6.

<sup>164</sup> Dio Cassius Roman History 49.16.1: Τῷ μὲν οὖν Καίσαρι ταῦτα παρὰ τῆς βουλῆς ἐδόθη, αὐτὸς δὲ τὸν τε Μεσσάλαν τὸν Οὐαλέριον, ὃν πρότερον ἐν ταῖς προγραφαῖς ἐτεθανατῶκει, ἐφ' τοὺς οἰωνιστὰς ὑπὲρ τὸν ἀριθμὸν ἐσέγραψε, καὶ τοὺς Οὐτικησίου πολίτας ἐποιήσατο, τὴν τε ἐσθητα τὴν ἀλουργη μηδένα ἄλλον ἐξω τῶν βουλευτῶν τῶν ἐν ταῖς ἀρχαῖς ὄντων ἐνδύεσθαι ἐκέλευσεν. ἤδη γὰρ τινες καὶ τῶν τυχόντων αὐτῷ ἐχρῶντο. "These were the privileges bestowed upon Caesar by the senate. And Caesar on his own responsibility enrolled among the augurs, above the proper number, Valerius Messalla, whom he had previously in the proscriptions condemned to death, made the people of Utica citizens, and gave orders that no one should wear the purple dress except the senators who were acting as magistrates: for some ordinary individuals were already using it." (trans. Loeb ed.).

<sup>165</sup> Reinhold, M (1970) op. cit. n. 98 p 46-7.

comment on the basis of the long-standing private use of purple in Rome and the lack of any qualification as to exactly what form of garments Dio is referring to. Such semantics do not, I believe, need to detain us here, as whatever the veracity of Octavian's attempts to curb the use of purple (it will have fitted with his retrospective and traditionalist ideals for Rome), it seems to have had no long term effects and may in fact have been merely an attempt to gain traditionalist support for the forthcoming rift with Marcus Antonius, who was at this time employing purple as a symbol of authority in the manner of Hellenistic monarchs of the East.<sup>166</sup> Suetonius records that the emperor Nero forbade the use of Tyrian purple and closed the shops of the purple dye merchants<sup>167</sup>, however, we have no further record of this and it may well have been revoked on that emperor's death.

Thus far, therefore, we can see little concerted effort towards Imperial control of purple dye, and as we have seen, its use continued to increase through the First-Third Centuries AD. Although some have seen the legislation of Severus Alexander referred to earlier as sign of the existence of a monopoly<sup>168</sup>, there appears to have been no trace of such Imperial control until the end of the Third Century when, as we have seen, the increased autocracy of Diocletian saw the association of purple with the Emperor and its use as a symbol of imperial authority. In parallel with the Late Imperial tendency to increase State controls in the economy, it is probably to this period that we can date the beginning of any imperial monopoly of purple dye production. Eusebius records that already by AD 300, the dye factories of Tyre had been brought under state control.<sup>169</sup>

The existence of *Procuratores Baphii* has already been noted with regard to production within Ebusus and they are also noted in Narbonensis, Tripolitania, Africa,

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<sup>166</sup> Florus *Epitome* 2.21.3: *Aureum in manu baculum, in latere acinaces, purpurea vestis ingentibus obstricta gemmis: diadema deerat, ut regina rex et ipse frueretur.* "In his hand was a golden sceptre, at his side a scimitar; he wore a purple robe studded with huge gems; a crown only was lacking to make him a king dallying with a queen." (trans. Loeb ed.).

<sup>167</sup> Suetonius *Nero* 6.32.3: *Et cum interdixisset usum amethystini ac Tyrii coloris summisissetque qui nundinarum die pauculas uncias venderet, praeclusit cunctos negotiatores.* "Having forbidden the use of amethystine or Tyrian purple dyes, he secretly sent a man to sell a few ounces on a market day and then closed the shops of all the dealers." (trans. Loeb ed.).

<sup>168</sup> Reinhold, M (1970) op. cit. n. 98 p 58.

<sup>169</sup> Eusebius *Vita Const.* 7.32.

Venetia and Histria, Sicily, Dalmatia and Calabria.<sup>170</sup> The Codex Theodosianus records the presence of Procurators of Purple Dye works with regard to the adulteration of dye<sup>171</sup> and in common with other forms of municipal and state employment during this period legislation was enacted to prevent dyers from escaping their profession and obligations by joining the church.<sup>172</sup> A similar constitution prevents the harbouring of slaves from state weaving factories.<sup>173</sup> In fact the status of purple dyers seems to have been a low one with enactments limiting their rights of marriage<sup>174</sup> and of property

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<sup>170</sup>Notitia Dignitatum Occidentis 10. Comes Sacrarum Largitionum G. Procuratores Bafiorum. If as I have argued the production of purple dye was intrinsically associated with that of salted fish, this distribution of Imperial procurators bears the surprising omission of Baetica.

<sup>171</sup> Codex Theodosianus 1.32.1: "Emperor Constantine Augustus to Felix. Since through the procurators of the privy purse, of the dye works, and of the weaving establishments, Our private substance is being diminished and the materials manufactured in the weaving establishments are being ruined, and in the dye-works the illegal mixture of the polluted dye produces stains, such procurators shall abstain from the patronage whereby they attain the aforesaid administrative positions, or if they should contravene this order, they shall be removed from the number of Roman citizens and struck down by the sword." (trans. Pharr, C (1952) The Theodosian Code and Novels and the Sirmonian Constitutions (Princeton).) cf also Codex Justinianus 11.8.2: *Idem A. ad Felicem. Procuratores rei privatae baphii et gynaeicii, per quos et privata nostra substantia tneatur et species in gynaeicii confectae corrumpuntur, in baphiis etiam admixta temeratio naevum adducit inquinatae adlusionis. suffragiis abstineant, per quae memoratas administrationes adipiscuntur, vel, si contra hoc fecerint, gladio feriantu.* (ed. Krueger, P (1880) Corpus Iuris Civilis).

<sup>172</sup> Codex Theodosianus 9.45.3: "The same Augustuses [Arcadius and Honorius] to Eutychianus, Praetorian Prefect. If, in the future, any slave, maidservant, decurion, public debtor, procurator, collector of purple dye fish, or anyone, finally, who is involved in public or private accounts should take refuge in a church, and if he should be either ordained a cleric or defended in any way by clerics and if he should not be returned to his former condition immediately by the issuance of a summons, decurions, indeed, and all others who are called by a customary function to the duty that they owe shall be recalled to their former lot by the energy and wisdom of the judges, as if by forcible seizure. We no longer permit such persons to have the benefit of the law which did not forbid decurions to be clerics after surrender of their patrimonies had ensued. But also those persons who are called stewards, that is, those who customarily manage ecclesiastical accounts, shall be compelled without any delay to the repayment of a public or private debt which it appears that those persons are obligated whom clerics received to be defended and did not suppose should be produced immediately." (trans. Pharr, C (1952) The Theodosian Code and Novels and the Sirmonian Constitutions (Princeton).)

<sup>173</sup> Codex Theodosianus 10.20.2: "Emperor Constantine Augustus to Taurus, Praetorian Prefect. A fine of five pounds of gold shall be exacted from any person who harbours a slave of any imperial weaving establishment and does not deliver such slaves before the kalends of September." cf also 10.20.7: "The same Augustuses [Valentinian, Valens and Gratian] to Philematius, Count of the Sacred Imperial Largesses. If any person should be discovered to be harboring any member of a guild of weavers, he shall be subjected to a penalty of five pounds of gold." (trans. Pharr, C (1952) The Theodosian Code and Novels and the Sirmonian Constitutions (Princeton).)

<sup>174</sup> Codex Theodosianus 10.20.3: "Emperors Valentinian and Valens Augustuses to Germanus, Provincial Governor. If freeborn women should unite themselves to imperial weavers and should be notified by formal announcement but should be unwilling to prefer the splendour of their ancestry to the baseness of such concubinage, they shall be held to the ignoble status of their husbands." 10.20.5: "Emperors Valentinian, Valens and Gratian Augustuses to Philematius, Count of the Sacred Imperial Largesses. If any person should accept a wife from a family of collectors of purple dye fish, he shall

ownership.<sup>175</sup> Further enactments in keeping with the wider professional traditions of the Late Empire attempted to maintain a hereditary workforce.<sup>176</sup> Such legislation may reflect the presence of an Imperial monopoly as labour control, or more particularly the need to secure a workforce was a major preoccupation of the Late Roman state and is well attested in any major discussion of the period. A edict of Gratian, Valentinian and Theodosius records that: *If any person should dare to usurp the use of a boat that is assigned to the compulsory public service of purple dye collection and to the collection of shellfish, he shall be held liable to the payment of two pounds of gold.*<sup>177</sup> Clearly the provision of boats and labour for the collection of *murex* was a municipal duty of some importance, although the existence of this law would suggest that some abuses occurred.

Thus we seem to see a gradual establishment of Imperial control over the production of purple dye, at least from the reign of Diocletian and this is borne out by the growing importance of its association with the office of emperor. This process seems to have reached its conclusion with the enactment of Theodosius II dated to 424, which sought to confiscate all garments dyed with sea-purple and to forbid its use and

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know that he must be bound to their ignoble status." (trans. Pharr, C (1952) The Theodosian Code and Novels and the Sirmonian Constitutions (Princeton).).

<sup>175</sup> Codex Theodosianus 10.20.14: "Emperor Theodosius Augustus and Valentinian Caesar to Maximinus, Count of the Sacred Imperial Largesses. If any purple dye fish collector should forsake and despise the office of his own ignoble status and should be said to have protected himself by the forbidden insignia of high rank and by cinctures of office that are absolutely denied to him, he shall be recalled to the bonds of his own profession and low birth status.

Moreover, if any person should appear to have been grasping for the property of those who manifestly remain in their low birth status and who are obedient to their customary services, such person shall restore to the ancient possessors everything whatever that is proved to have been possessed by him under any title whatever. But if a person born outside these guilds should retain such property and should prefer to become subject to the burdens of this alien and ignoble status rather than to restore such goods, he shall understand that thereafter he must undergo the future compulsory services, and for the past, if any delinquent payments should accumulate while he is in possession, he shall know that he must pay the same, without any exemption." (trans. Pharr, C (1952) The Theodosian Code and Novels and the Sirmonian Constitutions (Princeton).).

<sup>176</sup> Codex Theodosianus 10.20.15: "The same Augustus and Caesar [Theodosius and Valentinian] to Maximinus, Count of the Sacred Imperial Largesses. If any child has been born or should hereafter be born from a daughter of a purple dye fish collector and a father of another low birth status, he shall assume the obligations of his mother's ignoble status." (trans. Pharr, C (1952) The Theodosian Code and Novels and the Sirmonian Constitutions (Princeton).).

<sup>177</sup> Codex Theodosianus 10.20.12. (trans. Pharr, C (1952) The Theodosian Code and Novels and the Sirmonian Constitutions (Princeton).).

possession to all but the Imperial family.<sup>178</sup> The need to secure sufficient supplies of purple for the growing Imperial bureaucracy would have encouraged the growth of more direct imperial controls over production, however, I would contend that although some form of Imperial monopoly seems to have existed during the Late Empire, such was far from all embracing and complete, and that private production and exchange continued.

A number of sources attest to the existence of trade in purple dyed garments; an ostraca from Egypt dated to the 3rd September 42 AD is a receipt for eight pouches of purple.<sup>179</sup> The use of purple is amply attested within papyrological sources and was evidently commonplace. The use of cheaper natural purple dyes seems to have played an important part in satisfying this demand and appear to have been excluded from any Imperial control. The Tariff of Zarai dated to AD 202 includes a rate of only one denarius on a purple cloak<sup>180</sup>, a figure in marked contrast to the exorbitant prices given by Pliny<sup>181</sup> and which reflects the exploitation of cheaper forms of purple in order meet the growing requirements for purple garments and their extension through the different levels of Roman society. Even Diocletian's Edict of Maximum Prices promulgated in AD 301 provides evidence that private production and use was still an

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<sup>178</sup> Codex Theodosianus 10.21.3: "Emperor Theodosius Augustus to Maximinus, Count of the Sacred Imperial Largesses. All persons, of whatsoever sex, rank, skill, profession, or family, shall abstain from the possession of that kind of material that is dedicated only to the Emperor and to His household. Nor shall any person at his home weave or make silk cloaks or tunics which have been coloured with purple dye and woven with no admixture of anything else. Men shall bring forth from their homes and deliver tunics and cloaks that are dyed in all parts of their texture with the blood of the purple shellfish. No threads dyed with purple dye shall be interwoven, nor shall threads coloured by the same dye be spun out and made strong by the shrill sounding loom. Garments of all-purple must be surrendered to the treasury and must be immediately offered. There is no reason why any man should complain of having been deprived of the price, because it shall suffice that he obtains impunity for the violation of the law that he trampled underfoot, nor is there any reason why he should have occasion to worry about profits, since his life does not have to be placed at stake. But let no man now by such a concealment incur the peril of the toils of the new constitution; otherwise he shall sustain the danger of involvement in a crime similar to that of high treason." (trans. Pharr, C (1952) The Theodosian Code and Novels and the Sirmonian Constitutions (Princeton).).

<sup>179</sup> O. Petrie 264: Ἀπολλωνῖος ὁ καὶ Κρονῖος Ἑρμιου Νικανορι Πανῶς χα(ιρεῖν). Ἐχῶ παρὰ σου ἐν Βερενῖκ(ω) ἄς σοι ἐπεθηκα πορφ(ύρας) πηρᾶς ὀκτώ / π(ήραϊ) ἤ. Ἄγ Τιβέριου Κλαυδίου(υ) Καίσαρος Σεβαστου) Γερμάνικου Αυτοκράτορος μή(νος) Σεβαστου ζ. (ed. Tait, J G (1930) Greek Ostraca in the Bodleian Library at Oxford and various other collections volume 1. Egypt Exploration Society, Graeco-Roman Memoirs 21 (London).)

<sup>180</sup> CIL 8.4508.

<sup>181</sup> Pliny NH 9.53.104.

important factor with a large range of both mens and womens garments being listed.<sup>182</sup> The highest quality purple on silk is listed as costing 150,000 denarii per pound, with robes of Tyrian purple costing upwards of 10,000 denarii<sup>183</sup>, whilst cheaper natural purples could cost as little as 1,000 denarii. Clearly there was a wide range of different purple dyes available, however, the prices that could be achieved by the highest qualities show that the controlling influence was purchasing power as opposed to legislated restrictions on its use. Its wide availability can be seen in a clause of the Edict:

ἐν ἅπασιν μέντοι τοῖς προειρημένοις εἶδεσιν πάντα τὰ μέτρα παραφυλάσσεσθαι ὀφείλει, τοῦτο μὲν ἐν τοῖς γυναικείοις, τοῦτο δὲ ἐν τοῖς παιδικοῖς καὶ τοῖς λοιποῖς εἶδεσιν. ὧν κατὰ εἶδος μέτρον οὐ γεγένηται μεταξὺ τοῦ ἀγοραστοῦ καὶ τοῦ πράτου λόγου γενομένου τοῦτο μὲν τῆς ποιότητος τῆς πορφύρας καὶ τοῦ λίνου καὶ τοῦ σταθμοῦ καὶ τοῦ ἔρψου καὶ τοῦ μέτρου ἢ διάπροσις ὀφείλει γίγεσθαι.<sup>184</sup>

The continuation of private transactions, therefore, seems to have continued until the Fourth Century, and it has been suggested that some of the purple dye manufactured at Tyre will have been for private use.<sup>185</sup> A passage in Justinian's *Digest* shows the continuation of private production with the bequeathing of a dye factory from father to son<sup>186</sup>, at pattern of ownership that is suggested by the production of dye

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<sup>182</sup>on Diocletian's Edict of Maximum Prices, cf Glaser, E D in Frank, T (ed). (1959) *An Economic Survey of Ancient Rome* volume 5: 'Rome and Italy of the Empire' (ed. Clift, E H and Loane, H J) p 305-421.

<sup>183</sup>Edict of Maximum Prices 29.1-49.

<sup>184</sup>Edict of Maximum Prices 29.49: "In all the aforesaid types of merchandise all the standards are to be observed for women's as well as for children's and for all other types. Any type of merchandies for which a standard has not been specifically set is to be sold after a reckoning of the quality of the purple and of the linen, and of the weight, and of the workmanship, and of the standard has been made between the seller and the buyer." (trans. Glaser, E D).

<sup>185</sup>cf Reinhold, M (1970) op. cit. n. 98 p 63.

<sup>186</sup>*Digest of Justinian* 32.91.2: *Pater filio tabernam purpurarium eum servis institoribus et purpuris, quae in diem mortis eius ibi fuerunt, legavit. neque pretia purpurae condita neque debita neque reliqua legato contineri placuit.* "A father bequeathed to his son a purple shop, with the slave factors and the purple that was in it on the day of his death. It was held that the legacy included neither the

in a villa context at La Pila. In this perhaps we can see the definition of *sacer murex* and *publicus murex* as set down in the edict of Gratian, Valentinian and Theodosius of AD 383.<sup>187</sup> The former represented the highest qualities of purple dye and was restricted in use to the Imperial household, however, the latter *publicus murex* seems to have been of a lower standard and unrestricted in its use. It is also apparent, that despite the large numbers of laws restricting its production, private manufacture of purple dye continued.

Thus, although the Imperial government appears to have made repeated attempts to limit dye production to state factories, such were evidently unsuccessful. The expanding market and wide use of purple meant that it was beyond the government's primitive capacity for control and although oft-stated, the Imperial monopoly, like that of salt was never able to completely remove private production.

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price set aside to buy purple nor the debts nor the arrears." (trans. Mommsen, T, Krueger, P and Watson, A (1985) *The Digest of Justinian* (Philadelphia).).

<sup>187</sup>*Codex Theodosianus* 10.20.18: "The Same Augustuses to Apollonius, Count of the Sacred Imperial Largesses. Since it has been disclosed that almost three hundred pounds of purple dyed silk have been coloured in clandestine dyeing operations, not without involvement in the crime of high treason, and that no small weight of purple dye has been converted into money, and since witnesses under torture have revealed by what artifices privately owned silk and silk belonging to the fisc were customarily dyed alike with the purple dye belonging to the State, and since they have also revealed what persons were accomplices to this crime, and who were the assistants, and although traffic in purple dye has been prohibited by innumerable constitutions. We also forbid it by a new threat. We revive the regulation of Synesius of Illustrious memory, which was wrongfully annulled by Anysius of Illustrious memory, who surreptitiously obtained a rescript from Us by concealing the truth, and We command that every seventh man from the bureau of secretaries and every sixth man from the bureau of regular taxes and every fifth man from the bureau of registrars shall be sent to the dye works of Phoenicia for a fixed period of time, so that by the astuteness of these officials all fraud may be prevented, since they shall fear the forfeiture of their credit for terms of service which they have acquired with much toil. Furthermore, a fine of twenty pounds of gold is proposed." (trans. Pharr, C (1952) *The Theodosian Code and Novels and the Sirmonian Constitutions* (Princeton).).

## BIBLIOGRAPHY

- ABAD CASAL, L and SALA SELLÉS, F (1994) "El Oral (San Fulgencio, Alicante): Un poblado Ibérico antiguo en el sureste de la Península Ibérica" in *MM* 35: 183-211.
- ABAD VARELA, M and GARCÍA PÉREZ, M A (1992) "Estudio de Moluscos recogidos en la Villa Romana de La Pila, Altea (Alicante)" in *AEA* 65: 318-322.
- ABASCAL, J M and GISBERT SANTONJA, J A (1991) "Numismática y evidencia arqueológica en el alfar Romano de la Almadrava (Setla-Mirarosa-Miraflor)" in *Lucentum* 9-10: 133-160.
- ABASCAL, J M and GISBERT SANTONJA, J A (1992) "Epigrafía Romana de la villa de l'Almadrava (Setla-Mirarosa-Miraflor). Apendice: nuevas aportaciones a la epigrafía de Dianium (Denia, Alacant)" in *III Congres d'Estudis de la Marina Alta* (Alicante): 69-78.
- ACQUARO, E, AUBET, M E and FANTAR, M H (1993) *Insedimenti Fenici e Punici nel Mediterraneo Occidentale* (Rome).
- ADELSON, H L (1957) *Light weight solidi and Byzantine trade during the Sixth and Seventh Centuries*. Numismatic notes and monographs 38.
- AGUAROD OTAL, C (1991) *Ceramica Romana importada de cocina en la Tarraconense*. Institución Fernando el Católico 1281 (Zaragoza).
- AGUILAR SAENZ, A (1991) "Dependencias con funcionalidad agrícola en las villas romanas de la Península Ibérica" in *Alimenta. Homenaje al Dr Michel Ponsich*. Anejos de Gerion III: 261-279.
- ALBERTINI, E (1911) "Bas relief grec trouve a Javea" in *Comptes rendue de l'Academie des Inscription et Belles Lettres*: 165-169.
- ALBIACH DELSCALS, R and SORIANO SANCHEZ, R (1991) "Estudio de una 'domus' romana de Valentia y de los niveles que la amortizaban" in *Saguntum* 24: 75-95.
- ALCINA FRANCH, J (1946) "Descubrimiento de un horno romano en Vall de Uxo" in *Cronica del II Congreso Arqueológico del Sudeste Español* (Albacete), also known as *Boletín Arqueológico del Sudeste Español* 2.4-7: 329-333.

- ALFOLDY, G (1969) *Fasti Hispanienses* (Wiesbaden).
- ALFOLDY, G (1975) *Die Romischen Inschriften von Tarraco* Madrider Forschungen 10 (Berlin).
- ALFOLDY, G (1977) "Ein Ziegelstempel mit dem Namen eines Senators aus Villajoyosa in der Hispania Citerior" in *ZPE* 27: 217-221.
- ALFOLDY, G (1984) "Drei städtische Eliten im Römischen Hispanien" in *Gerion* 2: 193-238.
- ALFOLDY, G (1991) *Tarraco* Forum, temes d'història i d'arqueologia tarragonines 8.
- ALMAGRO BASCH, M (1945) "Excavaciones de Ampurias: últimos hallazgos y resultados" in *AEA* 18: 59-75.
- ALMAGRO BASCH, M, SERRA RAFOLS, J and COLOMINAS ROCA, J (1945) *Carta Arqueologica de Espana: Barcelona* (Madrid).
- ALMAGRO BASCH, M (1948) "Hallazgos numismáticos Ampuritanos" in *Ampurias* 10: 320-322.
- ALMAGRO BASCH, M (1964) *Excavaciones en la Palaiópolis de Ampurias* EAE 27 (Madrid).
- ALMAGRO GORBEA, M (1982) "La 'Colonización' Focense en la Península Ibérica" in *PP* 37: 432-444.
- ALMAGRO GORBEA, M (1991a) "La alimentación de la antigua Baria en época romana y preromana" in *Alimenta. Homenaje al Dr Michel Ponsich* Anejos de Gerion III: 119-128.
- ALMAGRO GORBEA, M (1991b) "El Mundo Orientalizante en la Península Ibérica" in *Atti del II Congresso Internazionale di Studi Fenici e Punici* Roma, 9-14 Novembre 1987 (Rome): 573-599.
- ALONSO VILLALOBOS, C, FLORIDO NAVARRO, C and MUÑOZ VICENTE, A (1991) "Aproximación a la tipología anfórica de la Punta del Nao (Cádiz, España)" in *Atti del II Congresso Internazionale di Studi Fenici e Punici* Roma, 9-14 Novembre 1987 (Rome): 601-616.
- ALVAR, J and WAGNER, C G (1988) "La actividad agrícola en la economía fenicia de la Península Ibérica" in *Gerion* 6: 169-185.

- AMOURETTI, M C, COMET, G, NEY, C and PAILLER, J-L (1984) "A Propos du pressoir a huile: de l'Archaeologie industrielle a l'histoire" in *MEFRA* 96: 379-421.
- ANDRÉ, J (1961) *L'alimentation et la cuisine a Rome* (Paris).
- ANDRE, P (1992) "Un atelier de salaisons chez les Venetes d'Amorique" in *REA* 94: 41-7.
- APARICIO, J, GURREA, V and CLIMENT, S (1983) *Carta Arqueologica de la Safor*. Instituto de Estudios Comarcales <Duque Real Alonso el Viejo>, Ayuntamiento de Gandia, Arqueologia 1 (Gandia).
- AQUARO, E, AUBET, M E and FANTAR, M H (1993) *Insedamenti Fenici e Punici nel Mediterraneo Occidentale: le pays de Carthage, Italia, Espana* Ministerio per i Beni Culturali e Ambientali, Comitato Nazionale per gli Studi e le Ricerche sulla Civiltà Fenicia e Punica. Itinerari 13 (Rome).
- AQUILUE ABADIAS, J (1987) *Las cerámicas africanas de la ciudad romana de Baetulo (Hispania Tarraconensis)* BAR Int. Ser. 337 (Oxford).
- ARANA CASTILLO, R (1985) "Envases para Salazon en el Bajo Imperio (II): Estudio mineralogico de las ceramicas Romanas de Aguilas y Mazarron (Murcia)" in *VI CIAS*, Cartagena 1982 (Cartagena): 443-449.
- ARANEGUI GASCO, C (1973) "Materiales Arqueologicos del Penon de Ifac (Calpe)" in *PLAV* 9: 49-69.
- ARANEGUI GASCO, C (1978) "Anotaciones sobre las anforas del nivel de relleno del Grau Vell (Sagunto, Valencia)" in *Saguntum* 13: 307-327.
- ARANEGUI GASCO, C and BAZZANA, A (1980) "Vestiges de structures défensives d'Époque Romaine Tardive et d'Époque Musulmane au Peñon d'Ifac (Calpe, province d'Alicante)" in *MCV* 16 p 421-436.
- ARANEGUI GASCO, C (1981) "La Produccion de Anforas Romanas en el Pais Valenciano: estado de la cuestion" in *Archivo Prehistoria Levantina* 16: 529-538.
- ARANEGUI GASCO, C (1982) *Excavaciones en el Grau Vell (Sagunto, Valencia)* TV del SIP 72 (Valencia).
- ARANEGUI GASCO, C and MANTILLA, A (1987) "La Produccion de anforas Dr 2-4 de Sagunto" in *El Vi a l'Antiguitat Economia, Produccio i Comerc al Mediterrani*

- Occidental Actes I Colloqui d'Arqueologia Romana* (Museo de Badalona) Monografies Badalonines num 9: 100-104.
- ARANEGUI GASCO, C, LOPEZ PINOL, M and ORFILA PONS, M (1991) "Anforas tardorromanas en el Grau Vell (Sagunto, Valencia)" in *Saguntum* 24: 117-127.
- ARANEGUI GASCO, C and GISBERT, J A (1992) "Les amphores a fond plat de la Peninsule Iberique" in F. Laubenheimer (ed) *Les amphores en Gaule*: 101-109.
- ARCE, J (1978) "La 'Crisis' del Siglo III d.C en Hispania y la invasiones Barbaras" in *Hispania Antiqua* 8: 257-269.
- ARCE, J (1979) "El Edictum de pretiis y la Diocesis Hispaniarum: notas sobre la economía de la Península Iberica en el Bajo Imperio Romano" in *Hispania* 39: 5-27.
- ARCE, J (1985) "Spania, spanos-spanne-spanon on papyri" in *ZPE* 61: 30-2.
- ARCE, J (1988) *España entre el mundo Antiguo y el mundo Medieval* (Madrid).
- ARENSON, S (1990) *The Encircled Sea: the Mediterranean maritime civilization* (London).
- ARINO GIL, A (1986) *Centuriaciones Romanas en el Valle Medio del Ebro* (Logrono).
- ARRIBAS, A (1963) *The Iberians* (London).
- ARROYO ILERA, R (1986) "Estudio numismatico de las excavaciones en el Portus Illicitanus, Santa Pola (Alicante). Campanas 1982 y 1983" in *Saguntum* 20: 257-278.
- ARROYO ILERA, R and BOLUFER I MARQUES, J (1988) "Analisi numismatica del conjunt monetari de la Punta de l'Arenal" in *Xabiya* 4: 26-37.
- ARTEAGA, O (1977) "Vorbericht uber die Grabungskampagne 1976 auf dem Cerro del Mar" in *Madriider Mitteilungen* 18: 101-115.
- ARTEAGA, O (1985) "Los Hornos Romanos del Manganeto, Almayate Bajo (Malaga): Informe Preliminar." in *NAH* 23: 177-189.
- AUBET, M E (1987) "Notas sobre la economía de los asentamientos Fenicios del sur de España" in *Dialoghi di Archeologia* 3rd Ser. 5.2: 51-62.
- AUBET, M E (1991) "Notas sobre las colonias de sur de España y su función en el marco territorial: el ejemplo del Cerro del Villar (Málaga)" in *Atti del II Congresso Internazionale di Studi Fenici e Punici* (Rome) vol. 2: 617-626.

- AUBET, M E (1993) *The Phoenicians and the West: Politics, Colonics and Trade* (Cambridge).
- BADIA, J (1966) "Hallazgo de anforas Romanas en Llafranc" in *Ampurias* 28: 265-6.
- BADIAN, E (1972) *Publicans and Sinners* (Oxford).
- BALIL, A (1953) "Un estudio sobre el 'Garum'" in *AEA* 26: 183-5.
- BALIL, A (1957) "Los Hallazgos monetarios y la influencia punica en el Levante Español" in *Caesaraugusta* 7/8: 111-114.
- BALIL, A (1959) "Hispania en los años 260 a 300 d JC" in *Emerita* 27: 269-295.
- BALIL, A (1964a) *Colonia Iulia Augusta Paterna Faventia Barcino*.
- BALIL, A (1964b) "Los gobernadores de la Hispania Tarraconense durante el Imperio Romano" in *Emerita* 32: 19-34.
- BALIL, A (1965a) "Garum, salazones y pesquerias en el Mediterraneo Hispanico" in *AEA* 38: 188-9.
- BALIL, A (1965b) "Aspectos sociales del Bajo Imperio" in *Latomus* 24: 886-904
- BALTAR VELOSO, R (1972) "Una nueva interpretacion de Edict. Diocl. 5, 12" in *Hispania Antiqua* 2: 61-68.
- BANE, R W (1976) "The development of Roman imperial attitudes and the Iberian wars" in *Emerita* 44: 409-422.
- BARKER, G and GRANT, A (eds) (1991) "Ancient and Modern Pastoralism in Central Italy: an interdisciplinary study in the Cicolano Mountains" in *PBSR* 59: 15-88.
- BARNISH, S J B (1987) "Pigs, Plebians and 'Potentes': Rome's Economic hinterland, c350-600 AD" in *PBSR* 55: 157-185.
- BARTI CATALA, A and PLANA MALLART, R (1993a) "Carrer d'Isaac Peral, 38 i 31 de Llafranc. Palafrugell" in *Anuari d'intervencions arqueològiques a Catalunya. Època Romana. Antiguitat Tardana. Campanyes 1982-9* (Barcelona): 72-3.
- BARTI CATALA, A and PLANA MALLART, R (1993b) "La terrisseria d'epoca romana de Llafranc (Palafrugell, Girona)" in *Cypsela* 10: 87-99.
- BELTRÁN LLORIS, M (1970) *Las Anforas Romanas en España* Institucion Fernando el Catolico 502 (Zaragoza).

- BELTRÁN LLORIS, M (1980) "El comercio del aceite en el valle del Ebro a finales de la Republica y comienzos del Imperio Romano" in *Produccion y comercio de aceite en la Antigüedad. Primer Congreso Internacional*: 187-224.
- BELTRÁN LLORIS, M (1987) "El Comercio del vino antiguo en el Valle del Ebro" in *El Vi a l'Antiguitat Economia, Produccio i Comerc al Mediterrani Occidental Actes I Colloqui d'Arqueologia Romana (Museo de Badalona) Monografies Badalonines num 9*: 51-73.
- BELTRÁN MARTINEZ, A (1946) "Los monumentos romanos de Cartagena segun sus series de monedas y lapidas latinas" in *Cronica del II Congreso Arqueologico del Sudeste Espanol (Albacete)*, also known as *Boletin Arqueologico del Sudeste Espanol* 2.4-7: 306-325.
- BELTRÁN MARTINEZ, A (1952a) "Sobre las excavaciones submarinas" in *Caesaraugusta* 3: 7-27.
- BELTRÁN MARTINEZ, A (1952b) "El Plano Arqueologico de Cartagena" in *AEA* 25: 47-82.
- BENITO, A Ma and EMPARAN, R (1987) "Anforas del yacimiento Submarino del Cabo del Higuier, Fuenterrabia (Guipuzcao)" in *El Vi a l'Antiguitat Economia, Produccio i Comerc al Medtierrani Occidental Actes I Colloqui d'Arqueologia Romana (Museo de Badalona) Monografies Badalonines num. 9*: 74-84.
- BENOIT, F (1959) "L'Économie du litoral de la Narbonnaise à l'Epoque Antique: le commerce du sel et les pêcheries" in *RSL* 15: 87-110.
- BENOIT, F (1961) "Relations commerciales entre le monde Ibero-Punique et le Midi de la Gaule de l'Epoque archaique a l'Epoque Romaine" in *REA* 63: 321-330.
- BERTHAULT, F and WATIER, B (1988) "Les amphores Romaines du Musee de Libourne" in *Aquitania* 6: 191-6.
- BERTHAULT, F (1989) "La mention ACET sur une amphore Pascual 1" in *Aquitania* 7: 195-7.
- BEZECZKY, T (1995) "Amphorae and amphora stamps from the Laecanius workshop" in *JRA* 8: 41-64.
- BLACKMANN, D J (1982a) "Ancient Harbours in the Mediterranean Pt 1" in *IJNA* 11.2: 79-104.

- BLACKMANN, D J (1982b) "Ancient Harbours in the Mediterranean Pt 2" in *IJNA* 11.3: 185-211.
- BLAKELY, J A (1988) "Ceramics and Commerce: Amphorae from Caesarea Maritima" in *BASOR* 271: 31-50.
- BLANCO, A and LUZÓN, J Ma (1969) "Pre-Roman Silver Mines at Rio Tinto" in *Antiquity* 43: 124-132.
- BLÁZQUEZ MARTÍNEZ, J M (1963) "El impacto de la conquista de la Hispania Romana en Roma (154-83 aC)" in *Klio* 41: 168-186.
- BLÁZQUEZ MARTÍNEZ, J M (1968a) "Exportacion e Importacion en Hispania a final de la Republica Romana y durante el gobierno de Augusto, y sus consecuencias" in *Anuario de Historia Economica y Social* 1: 37-84.
- BLÁZQUEZ MARTÍNEZ, J M (1968b) "La crisis del Siglo III en Hispania y Mauritania Tingitania" in *Hispania* 108: 5-37.
- BLÁZQUEZ MARTÍNEZ, J M (1973) "Economia de la Hispania Romana Republicana." in *Hispania* 33: 205-247.
- BLÁZQUEZ MARTÍNEZ, J M (1976) "Hispania desde el año 138 al 235 d.C" in *Hispania* 36: 5-87.
- BLÁZQUEZ MARTÍNEZ, J M (1978) *Economia de la Hispania Romana* (Madrid).
- BLÁZQUEZ MARTÍNEZ, J M (1983) "Panorama general de la presencia fenicia y púnica en España" in *Atti del I Congresso Internazionale di Studi Fenici e Punici* Roma, 5-10 Novembre 1979 (Rome): 311-373.
- BLÁZQUEZ MARTÍNEZ, J M and GARCIA-GELABERT PEREZ, M P (1991) "El transporte marítimo según las representaciones de los mosaicos Romanos, relieves y pinturas de Ostia" in *Lucentum* 9-10: 111-121.
- BLÁZQUEZ MARTÍNEZ, J M (1992a) "The latest work on the export of Baetican Olive Oil to Rome and the Army" in *G&R* 39 no 2: 173-188.
- BLÁZQUEZ MARTÍNEZ, J M (1992b) *Fenicios, Griegos y Cartagineses en Occidental* (Madrid).
- BLÁZQUEZ MARTÍNEZ, J M, REMESAL RODRÍGUEZ, J and RODRÍGUEZ ALMEIDA, E (1994) *Excavaciones Arqueológicas en el Monte Testaccio (Roma)*. *Memoria Campaña 1989* (Madrid).

- BOHN, O (1926) "Pinselschriften auf Amphoren aus Augst und Windisch" in *Anzeiger für Schweizerische Altertumskunde* 28: 197-212.
- BOLENS-HALIMI, L (1991) "Le garum en al-Andalus, un feu trouvé au fond des mers" in *Alimenta. Homenaje al Dr Michel Ponsich Anejos de Gerion* III: 355-371.
- BOLUFER I MARQUES, J (1986) "La Necropolis del Muntanyar" in *Xabiya* 1: 109-126.
- BOLUFER I MARQUES, J (1987a) "Una marca d'Amfora Maurítana de la Punta de l'Arenal (Xabia, Alacant)" in *El Vi a l'Antiguitat Economia, Produccio i Comerc al Mediterrani Occidental* Actes I Colloqui d'Arqueologia Romana (Museo de Badalona) Monografies Badalonines num 9: 443-445.
- BOLUFER I MARQUES, J (1987b) "Les Llanties Romanes de la Punta de l'Arenal" in *Xabiya* 2: 7-29.
- BOLUFER I MARQUES, J (1988) "Ceramiques fines tardanes de la Punta de l'Arenal" in *Xabiya* 4: 40-53.
- BONIFAY, M and PIÉRI, D (1995) "Ampoules du Ve au VIIe s. à Marseille: nouvelles données sur la typologie et contenu" in *JRA* 8: 94-120.
- BONNEVILLE, J N (1978) "Aux origines de Barcino Romaine (Barcelone)" in *REA* 80: 39-71.
- BOOT, J-P, CAMPO, M, COLLS, D, GUERRERO and MAYET, F (1992) *L'Epave Cabrera III (Majorque)*.
- BORRAS I QUEROL, C (1987) "Avance de las excavaciones en la Villa Romana del Mas d'Arago (Cervera del Maestrat)" in *CPAC* 13 p 379-393.
- BOSCH-GIMPERA, P (1929) "La Civilisation Iberique du Bas-Aragon" in *IV Congrés International d'Archeologie* (Barcelona).
- BOSCH-GIMPERA, P (1944a) *El Poblamiento Antiguo y la formacion de los pueblos de Espana* (Mexico).
- BOSCH-GIMPERA, P (1944b) "The Phokaians in the Far West: an historical reconstruction" in *CQ* 38: 53-9.
- BOTTINI, P and FRESCHI, A (1993) *Sulla Rotta della 'Venus': Storie di navi, commerci e ancore perdute. Catalogo della mostra, Maratea 1991*. Ministero beni Culturali e Ambientali and Centro Culturale Maratea. (Tarento).

- BOWMAN, A K (1974) "Roman military records from Vindolanda" in *Britannia* 5: 360-373.
- BOWMAN, A K (1985) "Landholding in the Hermopolite nome in the Fourth Century AD" in *JRS* 75: 137-163.
- BOYER, R (1986) "Conserve d'Olives dans deux amphores trouvées dans les fouilles de la Bourse, a Marseille" in *Gallia* 44.2: 229-233.
- BRADLEY, R (1992) "Roman Salt Production in Chichester Harbour: Rescue excavations at Chidham, West Sussex" in *Britannia* 23: 27-44.
- BRINKHUIZEN, D C and CLASON, A T (ed) (1986) *Fish and Archaeology. Studies in osteometry, taphonomy, seasonality and fishing methods* BAR Int Ser 294 (Oxford).
- BRISAY, K W de and EVANS, K A (ed) (1975) *Salt. The study of an ancient industry* (Colchester).
- BROMWICH, J (1993) *The Roman remains of Southern France* (London).
- BROUGHTON, T R S (1972) "Oil producing estates in Southern Spain" in *Vestigia 17: Akten des VI Internationalen Kongresses für griechische und lateinische Epigraphik* (München): 475-6.
- BROUGHTON, T R S (1974) "Some notes on trade and traders in Roman Spain" in Evans, J A S (ed) *Polis and Imperium: Studies in honour of Edward Togo Salmon*: 11-30.
- BRUN, J-P, ROGERS, G B, COLUMEAU, P and THINON, M (1989) "La villa Gallo-Romaine de Saint Michel a la Garde (Var): Une domaine oleicole au Haut-Empire" in *Gallia* 46: 103-162.
- BURILLO MOZOTA, F (1991) "The evolution of Iberian and Roman Towns in the Middle Ebro valley" in Barker, G and Lloyd, J *Roman Landscapes*: 37-46.
- CABRE AGUILO, J (1943) "La ceramica Celtica de Azaila" in *AEA* 16: 49-63.
- CAGNAT, R (1914) "A new Roman Customs list" in *JRS* 4: 142-146.
- CALLENDER, M (1965) *Roman Amphora* (London).
- CAMERON, A (1993) *The Mediterranean world in Late Antiquity AD 395-600* (London).

- CAMPANO LORENZO, A (1994) "De la producción de ánforas de salazón en la Bahía de Cádiz. Materiales del alfar de 'El Olivar de los Valencianos', Puerto Real" in *AEA* 67: 135-146.
- CAPANELLI, D (1990) "La explotación de las minas ibéricas y el comercio de metales en la época romana: unas cuantas reflexiones más" in *Gerion* 8: 227-239.
- CARADINI, A (1983) "Pottery and the African Economy" in Garnsey, P D A, Hopkins, K and Whittaker, C R (eds.) *Trade in the Ancient Economy* (Berkeley): 145-162.
- CARPENTER, R (1925) *The Greeks in Spain* (Bryn Mawr).
- CARRETÉ, J Ma, KEAY, S J and MILLETT, M (1995) *A Roman Provincial Capital and its Hinterland: The Survey of the territory of Tarragona, Spain, 1985-1990*. JRA Supplementary Series 15 (Ann Arbor).
- CASABO I BERNAD, J A (1994) "Resultats de la segona campanya d'excavacions d'urgència en la Necropoli Romana del Muntanyar (Xabia, Marina Alta)" in *Xabiya* 7: 66-75.
- CASTAÑER I MASOLIVER, P, TREMOLEDA I TRILLA, J and ROURE I BONAVENTURA, A (1990) "Un conjunt ceràmic de finals del segle III dC a Vilauba (Camós, Pla d'Estany)" in *Cypsela* 8: 157-191.
- CASTILLO GARCIA, C (1984) "Los senadores de la Bética: Onomástica y parentesco" in *Gerion* 2: 239-250.
- CASTILLO YURRITA, A del (1943) "La cerámica ibérica de Ampurias" in *AEA* 16: 1-48.
- CASTLE, S A (1978) "Amphora from Brockley Hill, 1975" in *Britannia* 9: 383-392.
- CAVANILLES, A J (1795) *Observaciones sobre la Historia Natural, Agricultura, Poblacion y Frutos del Reyno de Valencia* (Zaragoza).
- CHARLESWORTH, M P (1924) *Trade-routes and commerce of the Roman Empire* (Cambridge).
- CHATELAIN, L (1949) *Le Maroc des Romains* (Paris).
- CHAUSA, A (1987) "Presencia de ánforas vinarias en Vetera I y Neuss" in *El Vi a l'Antiguitat Economia, Produccio i Comerc al Mediterrani Occidental Actes I*

- Colloqui d'Arqueologia Romana (Museo de Badalona) Monografies Badalonines num 9: 312-318.
- CHERRY, J (1988) "Pastoralism and the role of animals in pre- and protohistoric economies of the Aegean" in Whittaker, C R (ed) *Pastoral Economies in Classical Antiquity* (Cambridge): 6-34.
- CHEVALLIER, R (1976) *Roman Roads* (London).
- CHINER MARTORELL, P (1990) *La Decoracion Arquitectonica en Saguntum* (Valencia).
- CHISHOLM, M (1979) *Rural Settlement and Land use* (London).
- CLARK, G (1989) "Animals and Animal Products in Medieval Italy: a discussion of Archaeological and Historical methodology" in *PBSR* 57: 152-171.
- COCKLE, H (1981) "Pottery Manufacture in Roman Egypt: a new papyrus" in *JRS* 71 p 87-97.
- COLLS, D (1986) "Les Amphores Leetaniennes de l'Epave Cap Bear III." in *REA* 88: 201-213.
- COLLS, D, DOUMERGUE, C and GUERRERO AYUSO, V (1986) "Les lingots de plomb de l'Epave Romaine Cabrera 5 (Ile de Cabrera, Baléares)" in *Archaeonautica* 6: 31-80.
- COMAS I SOLA, M (1985) *Baetulo: les amfores* (Museo de Badalona) Monografies Badalonines num 8.
- COMAS I SOLA, M (1987) "Importacio i Exportacio de vi a Baetulo: L'estudi de les amfores" in *El Vi a l'Antiguitat Economia, Produccio i Comerc al Mediterrani Occidental* Actes I Colloqui d'Arqueologia Romana (Museo de Badalona) Monografies Badalonines num 9: 161-173.
- CORCORAN, T H (1957) *The Roman Fishing Industry of the Late Republic and Early Empire* (unpublished PhD Thesis, Northwestern University).
- CORCORAN, T H (1958) "Pliny's Garum Castimoniarum" in *Classical Bulletin* 34: 69.
- CORCORAN, T H (1959) "Roman Fishponds" in *Classical Bulletin* 35: 37-43.
- CORCORAN, T H (1960) "Scarus, Fish of fame" in *Classical Bulletin* 37: 1-3.
- CORCORAN, T H (1963) "Roman Fish Sauces" in *Classical Journal* 58: 204-210.

- CORCORAN, T H (1964) "Fish treatises in the Early Roman Empire" in *Classical Journal* 59: 271-4.
- CORELL I VICENT, J (1985) "Nuevas inscripciones romanas del Pais Valenciano" in *Saguntum* 19: 279-299.
- CORELL I VICENT, J (1991) "Inscripciones romanas del Pais Valenciano" in *Saguntum* 24: 193-201.
- CORELL I VICENT, J (1993) *Las Inscripciones Romanas de la Safor TYRIS* Publicaciones del Departament de Filologia Clàssica, Universidad de Valencia. (Madrid).
- CORSI-SCIALLANO, M and LIOU, B (1985) *Les Epaves de Tarraconense a chargement d'amphores Dressel 2-4* in "Archaeonautica" 5 (Paris).
- CORTADA REUS, F (1946) *Geografia Economica de España* (Barcelona).
- CUMONT, F (1927) "Les Syriens en Espagne et les Adonies a Seville" in *Syria* 8: 320-331.
- CUNLIFFE, B (1988) *Greeks, Romans and Barbarians* (London).
- CURCHIN, L A (1983) "Personal wealth in Roman Spain" in *Historia* 32: 227-244.
- CURCHIN, L A (1985) "Vici and Pagi in Roman Spain" in *REA* 87: 327-343.
- CURCHIN, L A (1986) "Non Slave labour in Roman Spain" in *Gerion* 4: 177-187.
- CURCHIN, L A (1987a) "Social relations in Central Spain: Patrons, Freedmen and Slaves in the life of a Roman Provincial Hinterland" in *Ancient Society* 18: 75-90.
- CURCHIN, L A (1987b) "Demography and Romanization at Tarraco" in *AEA* 60: 159-171.
- CURCHIN, L A (1991) *Roman Spain: conquest and assimilation* (London).
- CURTIS, R I (1978) *The Production and Commerce of fish sauce in the Western Roman Empire* (unpublished PhD Thesis, Univ. of Maryland).
- CURTIS, R I (1979) "The Garum shop of Pompeii" in *Cronache Pompeiane* 5: 5-23.
- CURTIS, R I (1980) "A slur on Lucius Asicius, the Pompeian Gladiator" in *TAPA* 110: 51-61.
- CURTIS, R I (1983) "In defense of Garum" in *Classical Journal* 78: 232-240.
- CURTIS, R I (1984a) "Negotiatores Allecarii and the Herring" in *Phoenix* 38.2: 147-158.

- CURTIS, R I (1984b) "A Personalized Floor Mosaic from Pompeii" in *AJA* 88: 557-566.
- CURTIS, R I (1984c) "The Salted Fish Industry of Pompeii" in *Archaeology* 37,6: 58-9, 74-5.
- CURTIS, R I (1984d) "Product identification and advertising on Roman commercial amphorae" in *Ancient Society* 15-17: 209-228.
- CURTIS, R I (1984e) "Salted Fish Products in Ancient Medicine" in *Journal of the History of Medicine and Allied Science* 39.4: 430-445.
- CURTIS, R I (1988a) "Spanish trade in salted fish products in the 1st and 2nd centuries AD" in *IJNA* 17: 205-210.
- CURTIS, R I (1988b) "A. Umbricius Scaurus of Pompeii" in Curtis, R I (ed) *Studia Pompeiana & Classica in honor of Wilhelmina F. Jashemski* (vol 1): 19-50.
- CURTIS, R I (1990) "The Man who wipes his nose on his shirt sleeve" in *Laverna* 1: 1-12.
- CURTIS, R I (1991a) "Salt-fish products around the Strait of Gibraltar" in *JRA* 4: 299-305.
- CURTIS, R I (1991b) *Garum and Salsamenta: Production and Commerce in Materia Medica* (Leiden).
- DA VIEGA FERREIRA, O (1967) "Algumas consideraciones sobre as fabricas de conservas de peixe da antiguidade encontradas em Portugal" in *Arquivo de Beja* 23-4: 123-134.
- DA VIEGA FERREIRA, O (1968) "Algumas notas acerca da pesca na antiguidade" in *O Arqueologo Portugues* 3rd ser. 2: 113-133.
- DAIRE, M-Y (ed.) (1994) *Le Sel Gaulois Bouilleurs de sel et ateliers de briquetages armoricains à l'Age du Fer* (Editeur Centre Régional d'Archéologie d'Alet Supplément 1994- n° Q).
- DANGREAU, B and DESBAT, A (1988) "Les Amphores du depotoir Flavian du Bas-de-Loyasse a Lyon" in *Gallia* 45: 115-153.
- D'ARMS, J H (1981) *Commerce and social standing in Ancient Rome*. (Harvard).
- DAVIDSON, T (1993) "Fish, Sex and Revolution in Athens" in *CQ* 43: 53-66.
- DAVIES, O (1935) *Roman Mines in Europe*. (Oxford)

- DAVIES, R W (1971) "The Roman military diet" in *Britannia* 2: 122-142.
- DE FRUTOS, G, CHIC, G and BERRIATUA, N (1988) "Las Anforas de la factoria preromana de salazones de 'Las Redes' (Puertos de Santa Martia, Cadiz)" in Pereira Menaut, G (ed) *Actas Ier Congreso Peninsular de Historia Antigua* (Santiago de Compostela): 295-306.
- DE LA PENA, J F (1967) "Alfares y marcas de anforas del Valle Medio del Guadalquivir" in *AEA* 40: 129-137.
- DESBAT, A, LEQUEMENT, R and LIOU, B (1987) "Inscriptions peintes sur amphores: Lyon et Saint-Romaine-en-Gal" in *Archaeonautica* 7: 141-166.
- DIXON, P (1940) *The Iberians of Spain* (London).
- DOMINGUEZ MONEDERO, A J (1986) "La función económica de la ciudad griega de Emporion" in *Protohistoria Catalana*, 6<sup>é</sup> Col.loqui Internacional d'Arqueologia de Puigcerdà, 7-9 de Desembre de 1984, Institut d'Estudis Ceretans (Puigcerdà): 193-199.
- DOUMERGUE, C (1990) *Les Mines de la Péninsulé Ibérique dans l'Anitquité Romaine*. Collection de l'École Française de Rome 127 (Rome).
- DRIESCH, A von den (1980) "Osteoarchaologische auswertung von Garum-resten des Cerro del Mar" in *MM* 21: 151-154.
- DUBY, G (1973) *Guerriers et paysans, VII-XII<sup>e</sup> siècle. Premier essor de l'économie européenne* (Éd. Gallimard).
- DUNCAN-JONES, R (1977) *The Economy of the Roman Empire* (Cambridge).
- DUNCAN-JONES, R (1990) *Structure and Scale in the Roman Economy* (Cambridge).
- DUPRE, N (1973) "La place de la Vallee de l'Ebre dans L'Espagne Romaine" in *MCV* 9: 133-175.
- DUPRÉ, X and REVILLA CALVO, V (1991) "Lastras Campana en Tarraco (Hispania Citerior) y su Territorio" in *MM* 32: 117-140.
- DYSON, S L (1987) "The Distribution of Roman Republican family names" in *Ancient Society* 18: 257-300.
- DYSON, S L (1992) *Community and Society in Roman Italy* (Baltimore).
- EDMONDS, J M (1961) *The Fragments of Attic comedy* (Leiden).

- EDMONDSON, J C (1987) *Two Industries in Roman Lusitania* BAR Int Ser 362. (London).
- EDMONDSON, J C (1989) "Mining in the Later Roman Empire and beyond: continuity or disruption?" in *JRS* 79: 84-102.
- EDMONDSON, J C (1990) "Le Garum en Lusitanie urbaine et rurale: hierarchies de demande et de production." in Gorges, J G (ed) *Les Villes de Lusitania Romaine*.
- ENGUIX, R and ARANEGUI GASCO, C (1977) *El taller de las anforas Romanas de Oliva* T.V.del S.I.P 54 (Valencia).
- ESPINALT, B (1786) *Atlante Espanol, o Descripcion general de todo el Reyno de Espana: Tomo IX. Descripcion del Reyno de Valencia, parte II* (Madrid).
- ESPINOSA RUIZ, V (1986) *Epigrafia Romana de la Rioja* Consejo Superior de Investigaciones Cientificas. Instituto de Estudios Riojanos. (Logrono).
- ETIENNE, R (1958) *Le Culte Imperial dans la Peninsule Iberique d'Auguste a Diocletian* (Paris).
- ETIENNE, R (1970) "A propos du 'Garum Sociorum'" in *Latomus* 29: 297-313.
- ETIENNE, R and FABRE, G (1973) "L'immigration a Tarragone, capitale d'une province romaine d'Occident" in *Revista de la Universidad Complutense. Homenaje a Garcia Bellido IV* 18: 97-115.
- ETIENNE, R (1975) "A propos de Vin Pompeien" in Andreae, H and Kyrieleis, H (ed) *Neue Forschungen in Pompeji* (Recklinghausen): 309-316.
- ETIENNE, R and MAYET, F (1991) "Le Garum a la mode de Scaurus" in *Alimenta. Homenaje al Dr Michel Ponsich* Anejos de Gerion III: 187-194.
- ETIENNE, R, MAKAROUN, Y and MAYET, F (1994) *Un Grand Complexe Industriel a Troia (Portugal)* (Paris).
- ETTLINGER, E (1977) "Aspects of Amphora-typology: seen from the North" in *Methodes Classiques et Methodes Formelles dans l'etude des Amphores* Actes du Colloque de Rome, 27-29 Mai 1974. Collection de l'ecole Francais de Rome 32 (Rome): 9-16.
- FABRE, G, MAYER, M and RODA, I (1984) *Inscriptions Romaines de Catalogne I. Barcelone* (Paris).

- FABRE, G, MAYER, M and RODA, I (1985) *Inscriptions Romaines de Catalogne II. Lerida* (Paris).
- FABRE, G, MAYER, M and RODA, I (1991) *Inscriptions Romaines de Catalogne III. Gerone* (Paris).
- FERNANDEZ, M I (1987) "Las Anforas de la Sala de Arqueologia de Ceuta" in *El Vi a l'Antiquitat Economia, Produccio i Comerc al Mediterrani Occidental Actes I Colloqui d'Arqueologia Romana*. (Museo de Badalona) Monografies Badalonises num. 9: 91-95.
- FERNÁNDEZ CASTRO, M C (1995) *Iberia in Prehistory* (Oxford).
- FERNANDEZ IZQUIERDO, A (1982) "Estudio del trafico maritimo en la costa de Castellon. A traves de la Arqueologia Submarina" in *Saguntum* 17: 113-129.
- FERNANDEZ IZQUIERDO, A (1984) *Las Anforas Romanas de Valentia y de su entorno marítimo* (Valencia).
- FERNANDEZ IZQUIERDO, A (1985) "El yacimiento submarino de Ben-Afeli (Almazora, Castellon). Campana de excavaciones 1984" in *CPAC* 11: 157-166.
- FERNANDEZ IZQUIERDO, A (1990) "El yacimiento de 'Piedras de la Barbada' (Benicarlo, Castellon). Campana 1989" in *CPAC* 15: 401-417.
- FERNANDEZ IZQUIERDO, A and GISBERT SANTONJA, J A (1992) "Investigaciones Arqueologicas Subacuaticas en las costas de Denia 1985-1989" in *III Congres d'Estudis de la Marina Alta* (Alicante): 79-88.
- FERNÁNDEZ OCHOA, C (1994) *Una Industria de salazones de Epoca Romana en la Plaza del Marques* Excavaciones Arqueologicas en la Ciudad de Gijon (Gijon).
- FERNÁNDEZ OCHOA, C and MARTÍNEZ MAGANTO, J (1994) "Las industrias de salazón en el Norte de la Península Ibérica en Época Romana. Nuevas aportaciones" in *AEA* 67: 115-134.
- FERRER SOLER, A (1951) "Hallazgo de una necropolis Romana en el Santuario del Vinyet (Sitges)" in *Ampurias* 13: 191-195.
- FIGUERAS PACHERO, F (1934) *Excavaciones en la Isla del Campello (Alicante 1931-1933)* JSTA 34 (Madrid).
- FIGUERAS PACHERO, F (1945) "Panorama arqueologico de Javea y sus cercanias" in *AEA* 18: 1-33.

- FIGUERAS PACHERO, F (1947) "Griegos y Punicos en el Sudeste de Espana: proceso geografico-historico de la Colonizacion" in *Cronicas del III Congreso Arqueologico del Sudeste Espanol* (Murcia): 187-201.
- FIGUERAS PACHERO, F (1950) "La Isleta del Campello del litoral de Alicante. Un yacimiento sintesis de las antiguas culturas del Mediterraneo" in *AEA* 23:13-37.
- FINLEY, M (1973) *The Ancient Economy* (London).
- FITZPATRICK, A (1985) "The distribution of Dressel 1 Amphorae in North-Western Europe" in *OJA* 4: 305-321.
- FITZPATRICK, A (1987) "The structure of a Distribution Map: Problems in sample bias and quantitative studies" in *Rei Cretariae Romanae Fautorum* 25/26: 70-112.
- FLETCHER VALLS, D (1955) "Actividades arqueologicas del S.I.P de Valencia durante 1953" in *AEA* 28: 160-166.
- FLETCHER VALLS, D and ALCACER GRAU, J (1961) "El horno romano de Olocau" in *APL* 9: 115-140.
- FLETCHER VALLS, D (1965) "Tipologia de los hornos ceramicos Romanos de Espana" in *AEA* 38: 170-174.
- FOERSTER, F (1974) "Spain. Sa Tuna and Los Ullastres (Gerona)" in *IJNA* 3.
- FOERSTER, F (1980) "A Roman Wreck off Cap del Vol, Gerona, Spain." in *IJNA* 9 244-253.
- FOERSTER, F, PASCUAL GUASH, R and BARBERÁ, J (1987) *El Pecio Romano de Palamós*.
- FOERSTER, F (1989) "Dispersal of finds on the sea bed at Llafranch, Girona Province, Costa Brava, Spain" in *IJNA* 18: 265-6.
- FORBES, R J (1955) *Studies in Ancient Technology* Vol III (Leiden).
- FORMIGÉ, J (1947) "La Station Antique de Lero a l'Ile Sainte-Marguerite (Alpes-Maritimes)" in *Gallia* 5 p 146-155.
- FOUCHER, L (1968) "Note sur l'industrie et le commerce des Salsamenta et du Garum" in *93e Congress national de Societes Savantes: Tours 1968*: 17-21.
- FRAYN, J M (1979) *Subsistence Farming in Roman Italy* (London).
- FRANK, T (1936) "On the export tax of Spanish Harbours" in *AJPh*: 87-90.
- FRANK, T (1937) "Notes on Roman Commerce" in *JRS* 27: 72-79.

- FRANK, T (1959) *An Economic Survey of Ancient Rome* (Baltimore).
- FRANQUESA, R (1987) "Análisis económico de una área de pesca de litoral" in *Investigación Pesquera* 51: 37-53.
- FREDERIKSON, M W (1975) "Theory, Evidence and Ancient Economy" Review of M.I.Finley (1973) in *JRS* 65: 164-171.
- FULFORD, M (1980) "Carthage: Overseas Trade and the Political Economy, cAD 400-700" in *Reading Medieval Studies* 6: 68-79.
- GALIAY, J (1943) "Los mosaicos de Fraga en el Museo de Zaragoza" in *AEA* 16: 227-230.
- GALLANT, T W (1985) *A Fisherman's Tale* *Miscellanea Graeca* 7 (Ghent).
- GARCIA-BELLIDO, M P (1986) "Nuevos documentos sobre minería y agricultura romana en Hispania" in *AEA* 59: 13-46.
- GARCÍA CANO, C, GARCÍA CANO, J M<sup>a</sup> (1992) "Cerámica Ática del poblado Ibérico de la loma del Escorial (Los Nietos, Cartagena)" in *AEA* 65: 3-32.
- GARCIA DEL TORO, J R (1978) "Garum Sociorum: La industria de salazones de pescado en la Edad Antigua en Cartagena" in *Anales de la Universidad de Murcia* 36.1-2: 27-57.
- GARCIA Y BELLIDO, A (1940) "Las primeras navegaciones Griegas a Iberia (s. IX-VIII a.d.C)" in *AEA* 41: 97-127.
- GARCIA Y BELLIDO, A (1942) *Fenicios y Carthagineses en Occidente* (Madrid).
- GARCIA Y BELLIDO, A (1948) *Hispania Graeca* (Barcelona).
- GARCIA Y BELLIDO, A (1959a) "Marcas de terra sigillata en caracteres ibéricos: Protemus en Azaila" in *AEA* 32: 164-6.
- GARCIA Y BELLIDO, A (1959b) "Cerámica Romana de paredes rugosas" in *AEA* 32: 166-167.
- GARCIA Y BELLIDO, A (1966) "Los 'Mercatores', 'Negotiatores' y 'Publicani' como vehículos de Romanización en la España Romana Preimperial" in *Hispania* 26: 497-512.
- GARCIA VILLANUEVA, I and ROSSELLO MESQUIDA, M (1992) "Las ánforas Tardorromanas de Punta de l'Illa de Cullera" in *Estudios de Arqueología Ibérica y Romana. Homenaje a Enrique Pla Ballester* TV del SIP num. 89: 639-657.

- GARNSEY, P and SALLER, R (1987) *The Roman Empire: Economy, Society and Culture* (London).
- GARRIDO RUIZ, J P (1970) *Excavaciones en la necropolis de 'La Joya', Huelva* EAE 71 (Madrid).
- GARRIDO, J P and ORTA, E M (1982) "Las ceramicas griegas de Huelva" in *PP* 37: 407-416.
- GIANFROTTA, P A (1982) "Lentulo Augure e le anfore Laietane" in *Tituli* 4: 475-9.
- GIOVANNINI, A (1985) "Le sel et la fortune de Rome" in *Athenaeum* 63: 373-387.
- GISBERT SANTONJA, J A (1980) "El yacimiento romano del Tossalet de les Mondes (Pego)" in *Saguntum* 15: 207-231.
- GISBERT SANTONJA, J A (1985) "Hallazgos Arqueologicos submarinos en la costa de Denia. Las Anforas de cronologia Romana Republicana" in *VI CIAS*, Cartagena 1982 (Cartagena): 411-424.
- GISBERT SANTONJA, J A (1987) "La produccio de vi al territori de Dianium durant l'Alt Imperi: el taller d'amfores de la villa Romana de L'Almadrava (Setla-Mirarosa-Miraflor)" in *El Vi a l'Antiguitat Economia, Produccio i Comerc al Mediterrani Occidental* Actes I Colloqui d'Arqueologia Romana (Museo de Badalona) Monografies Badalonines num 9: 104-118.
- GISBERT SANTONJA, J A (1992) "Dues terrisseries Romanas del territorio de Dianium. Els jaciments de Perdigo i de la Teulera de Jesus Pobre (Denia, Alacant)" in *III Congres d'Estudis de la Marina Alta* (Alicante): 89-100.
- GOLOBARDES, M (1947) "Las vias Romanas en el Ampurdan" in *Ampurias* 9: 35-41.
- GOMEZ BELLARD, C (1990) *La Colonizacion Fenicia de la Isla de Ibiza* EAE 157. (Madrid).
- GOMEZ BELLARD, C (1992) "L'Île d'Ibiza dans le commerce en Méditerranée Occidentale à l'époque archaïque: quelques données nouvelles" in Hackens, T and Moucharte, G (eds) *Studia Phoenicia* 9: *Numismatique et histoire économique phéniciennes et puniques* (Louvain-la-Neuve): 299-309.

- GONZALEZ CRAVIOTO, E (1982) "Relaciones comerciales entre Carthago Nova y Mauritania durante el Principado de Augusto" in *Anales de la Universidad de Murcia* 40. 3-4: 13-26.
- GONZALEZ FERNANDEZ, J (1989) *Corpus de Inscripciones Latinas de Andalucia I: Huelva* (Sevilla).
- GONZALEZ FERNANDEZ, J (1991a) *Corpus de Inscripciones Latinas de Andalucia II: Sevilla I: La Vega (Hispalis)* (Sevilla).
- GONZALEZ FERNANDEZ, J (1991b) *Corpus de Inscripciones Latinas de Andalucia II: Sevilla II: La Vega (Italica)* (Sevilla).
- GONZALEZ SERRANO, Ma P (1988) "Anforas y salazones" in *Anejos de Gerion* 1: 285-305.
- GORGES, J G (1979) *Les Villas Hispano-Romaines* (Paris).
- GOULETQUER, P L (1970) *Les Briquetages Armoricains: Technologie protohistorique du sel en Armorique* Travaux du laboratoire d'Anthropologie Préhistorique. Equipe de Recherche du CNRS n° 27. Faculté des Sciences (Rennes).
- GOWERS, E (1993) *The Loaded Table. Representations of food in Roman Literature* (Oxford).
- GRACE, V G (1961) *Amphoras and the Ancient Wine Trade*. American School of Classical Studies at Athens (Princeton).
- GRACIA ALONSO, F (1982) "Ordenacion tipologica del instrumental de pesca en Bronce Ibero-Romano" in *Pyrenae* 17-18: 315-328.
- GRAHAM, A J (1990) "Pre-Colonial Contacts: Questions and Problems" in Descoeudres, J-P (ed.) *Greek Colonists and Native Populations: Proceedings of the First Australian Congress of Classical Archaeology held in honour of Emeritus Professor A.D. Trendall* (Oxford): 45-60.
- GRANADOS, J-O and ROVIRA, C (1987) "Tres nous centres de produccio d'amfores a l'ager de la Colonia Barcino" in *El Vi a l'Antiguitat Economia, Produccio i Comercial Mediterrani Occidental* Actes I Colloqui d'Arqueologia Romana (Museo de Badalona) Monografies Badalonines num 9: 126-132.
- GRANT, M (1976) *Cities of Vesuvius* (London).
- GREEN, R P H (1991) *The Works of Ausonius* (Oxford).

- GREENE, K (1986) *The Archaeology of the Roman Economy* (London).
- GREENE, K (1992a) "The Economy of Roman Spain" in *CR NS* 42.2: 407-409.
- GREENE, K (1992b) *Roman Pottery* (Berkeley).
- GRENIER, A (1932) "Le Garum de Frejus" in *REA* 34: 291-292.
- GRIERSON, P (1959) "Commerce in the Dark Ages: a critique of the evidence" in *Trans Royal Hist Soc* 9: 123-140.
- GRIGG, D (1982) *The Dynamics of Agricultural Change* (London).
- GRIMAL, P and MONOD, T (1952) "Sur la veritable nature du Garum" in *REA* 54: 27-38.
- GUERRERO AYUSO, V M (1986) "Una aportacion al estudio de la anforas Punicas Mana C" in *Archaeonautica* 6: 147-186.
- GUSI I JENER, F and OLARIA I PUYOLES, C (1991) *El Poblado Neoneolitico de Terrera-Ventura (Tabernas, Almeria)* EAE 160 (Madrid).
- HALBOUT, P (1989) "Une halle aux poissons a Rouen aux IIe-IIIe siecles" in *Gallia* 46: 163-172.
- HALEY, E V (1988) "Roman elite involvement in Commerce: the case of the Spanish TT.Mamilii" in *AEA* 61: 141-156.
- HALEY, E V (1990) "The Fish Sauce trader L.Iunius Puteolanus" in *ZPE* 80: 72-78.
- HALEY, E V (1991) *Migration and Economy in Roman Imperial Spain Aurea Saecula* 5 (Barcelona).
- HALL, A R and KENWARD, H K (1990) *Environmental Evidence from the Colonia The Archaeology of York. The Environment* 14/6. CBA (Dorchester).
- HALSTEAD, P (1981) "Counting Sheep in Neolithic and Bronze Age Greece" in Hodder, I, Isaac, G and Hammond, N (eds) *Patterns of the Past: Studies in honour of David Clarke* (Cambridge): 307-339.
- HARRISON, R J (1988) *Spain at the dawn of history* (London).
- HASSALL, M (1978) "Roman Britain and the Rhine provinces: epigraphic evidence for Roman trade" in Du Plat Taylor, J and Cleere, H *Roman Shipping and trade: Britain and the Rhine Provinces* (London): 41-46.
- HASSALL, M and TOMLIN, R S O (1984) "Roman Britain in 1983: ii. Inscriptions" in *Britannia* 15: 333-356.

- HAYES, J W (1972) *Late Roman Pottery* (London).
- HAYES, J W (1980) *A Supplement to Late Roman Pottery* (London).
- HERNANDEZ, Ma J, ANGEL CAU, M and ORFILA PONS, M (1992) "Nuevos datos sobre el poblamiento antiguo de la isla de Cabrera (Baleares). Una posible factoria de salazones" in *Saguntum* 25: 213-221.
- HERNANDEZ PEREZ, M S, ABAD, L and LLOBREGAT, E A (1986) *Arqueologia en Alicante 1976-1986* (Alicante).
- HERRERO LORENZO, M P (1981) *Estudio de las Salinas de la Bahía Gaditana* (Unpublished PhD thesis, Depto. de Filología Griega. Universidad Complutense de Madrid.)
- HESNARD, A (1977) "Note sur un atelier d'amphores Dr 1 et Dr 2-4 pres de Terracine" in *MEFRA* 89: 157-168.
- HESNARD, A (1980) "Un depot Augusteen d'amphores a La Longarina, Ostie" in D'Arms, J H and Kopff, E C *The Sea-borne Commerce of Ancient Rome: Studies in Archaeology and History* Mem. Amer. Acad. Rome 36 (Rome): 141-156.
- HOCQUET, J-C (1978) *Le Sel et la fortune de Venise* 2 vols (Lille).
- HODKINSON, S (1988) "Animal Husbandry in the Greek Polis" in Whittaker, C R (ed) *Pastoral Economies in Classical Antiquity* (Cambridge): 35-75.
- HOLUM, K G, HOHLFELDER, R L, BULL, R J and RABAN, A (1988) *King Herod's Dream: Caesarea on the Sea* (New York).
- HOPKINS, K (1980) "Taxes and trade in the Roman Empire" in *JRS* 70: 101-125.
- HOPKINSON, B (1975) "Archaeological evidence of saltmoulding at important European salt-sites and its relationship to the distribution of Urnfielders" in *JIES* 3.1: 1-52.
- HOUGHTON, F T S (1929) "Salt-ways" in *Transactions and Proceedings of the Birmingham Archaeology Society* 54: 1-17.
- HOYOS, B D (1992) "Sluice gates or Neptune at New Carthage, 209 BC" in *Historia* 41: 124-8.
- HUDSON, N (1992) *Land Husbandry* (London).
- IBARRA I MANZONI, A (1880 repr 1981) *Illici, su situacion y antiguedades*.

- IMMERZEEL, M (1990) "Prodection: Negotiator Allecarius. Fabrication et commerce de sauce de poissons dans le Nord-Ouest de l'Empire Romain" in *Oudheidkundige Mededeelingen* 70: 183-192.
- JARDIN, C (1961) "Garum et sauces de poisson de l'antiquité" in *RSL* 27: 70-96.
- JARREGA, R (1987) "Un possible taller i una nova estampilla amforal de la Villa Romana de les Cabres (Ocata-El Masnou, Maresme)" in *El Vi a l'Antiquitat Economica, Produccio i Comerc al Mediterrani Occidental Actes I Colloqui d'Arqueologia Romana* (Museo de Badalona) Monografies Badalonines num 9: 246-249.
- JOHNSON, A C and WEST, L C (1949) *Byzantine Egypt: economic studies* (Princeton).
- JONES, R E (1986) *Greek and Cypriot Pottery* (Athens).
- JONES, R F J (1992) "The Roman Empire in microcosm: Roman Spain" in *Antiquity* 66: 809-811.
- JONGMAN, W (1988) *The Economy and Society of Pompeii* (Amsterdam).
- KAPITAN, G (1974) "A Third Century AD shipwreck at Cape Ognina (Siracusa, Sicily)" in *IJNA* 3.1: 150-151.
- KEAY, S J (1981) "The Conventus Tarraconensis in the Third Century AD: crisis or change?" in King, A and Henig, M (eds) *The Roman West in the Third Century. Contributions from Archaeology and History* BAR Int Ser 109: 451-486.
- KEAY, S J and JONES, L (1982) "Differentiation of Early Imperial amphora production in Hispania Tarraconensis" in Freestone, I, Potter, T and Johns, C *Current research in ceramics: Thin Section Studies* (London): 45-61.
- KEAY, S J (1983) "The import of olive oil into Catalunya during the Third Century AD" in *Produccion y comercio del aceite en la antiguedad. Segundo Congreso Internacional*: 551-568.
- KEAY, S J (1984a) "Decline or continuity? The coastal economy of the Conventus Tarraconensis from the Fourth Century until the Late Sixth Century" in Blagg, T, Jones, R and Keay, S J *Papers in Iberian Archaeology* BAR Int Ser 193: 552-577.
- KEAY, S J (1984b) *Late Roman Amphorae in the Western Mediterranean: a typology and economic study: the Catalan evidence* BAR Int Ser 196 (Oxford).

- KEAY, S J (1987) "La Importacion de vino y aceite en la Tarraconense Oriental en la Antigüedad" in *El Vi a l'Antiguitat Economia, Produccio i Comerc al Mediterrani Occidental* Actes I Colloqui d'Arqueologia Romana (Museo de Badalona) Monografies Badalonines num 9: 383-395.
- KEAY, S J (1988) *Roman Spain* (London).
- KEAY, S J (1991a) "The Ager Tarraconensis in the Late Empire: a model for town and country in Eastern Spain?" in Barker, G and Lloyd, J (1991) *Roman Landscapes*: 79-87.
- KEAY, S J (1991b) "New light on Tarraco (Tarragona) during the late empire" in *JRA* 4: 387-397.
- KEAY, S J (1992) "The Romanisation of Turdetania" in *OJA* 11.3: 275-315.
- KOEHLER, C G (1981) "Corinthian developments in the study of trade in the Fifth Century" in *Hesperia* 50: 449-458.
- LAGOSTENA BARRIOS, L (1996) "Explotación del salazón en la Bahía de Cádiz en la Antigüedad: aportación al conocimiento de su evolución a través de la producción de ánforas Mañá C" in *Florentia Iliberitana* 7: 141-169.
- LAFUENTE VIDAL, J (1944) "Algunos datos concretos de la Provincia de Alicante sobre el problema cronológico de la Cerámica Iberica" in *AEA* 17: 68-87.
- LANTIER, R (1952) "Algunos aspectos nuevos de la historia y la arqueología del periodo de las grandes invasiones en las Galias" in *Ampurias* 14: 218-224.
- LAST, R and PORATH, P (1993) "A Roman stamped amphora rim from Beth-Shan" in *ZPE* 95: 52.
- LAUBENHEIMER, F and WATIER, B (1991) "Les amphores des Alleees de Tournay a Bordeaux" in *Aquitania* 9: 5-40.
- LAUBENHEIMER, F, GEBARA, C and BERAUD, I (1992) "Production d'amphores a Frejus" in Laubeheimer, F (ed) *Les Amphores en Gaule*: 15-24.
- LAURENCE, R (1994) *Roman Pompeii: Space and Society* (London).
- LEIGHTON, A C (1972) *Transport and Communication in Early Medieval Europe AD 500-1100* (Newton Abbot).
- LE ROUX, P (1985) "Procurator affranchi in Hispania: Saturninus et l'activite miniere" in *MM* 26: 218-233.

- LEQUEMENT, R (1980) "Deux inscriptions peintes sur amphores de Betique a Alesia" in *Revue Archeologique de l'Est et du Centre-Est* 31: 256-9.
- LIU, B and MARICHAL, R (1978) "Les inscriptions peintes sur amphores de l'anse Saint-Gervais a Fos-sur-Mer" in *Archaeonautica* 2: 109-181.
- LIU, B (1982) "Direction des recherches archéologiques sous-marines" in *Gallia* 40 p 437-454.
- LLOBREGAT, E A (1967) "Datos para el estudio de las ceramicas ibericas de la epoca imperial romana" in *X CNA*: 366-378.
- LLOBREGAT, E A and TARRADELL, M (1969) "Avance de los resultados de las excavaciones arqueologicas en curso en el Tossal de Manises (Alicante) durante los meses de agosto a noviembre de ano 1966" in *NAH* 10-12 (1966-68): 141-146.
- LLOBREGAT, E A (1974) "Las relaciones con Ibiza en la protohistoria valenciana" in *V Symposium de Prehistoria*: 291-320.
- LLOBREGAT, E A (1977a) "Un grafito en escritura punica de la Illeta dels Banyets (El Campello, Alicante)" in *ITEM* 1: 91-95.
- LLOBREGAT, E A (1977b) "Enterramientos de epoca romana tardia en Concentaina, Alicante" in *Segovia y la Arqueologia Romana*: 257-264.
- LLOBREGAT, E A (1981) "Una nueva inscripcion romana del Tossal de Manises y la localizacion del toponimo Lucentum" in *Revista del Instituto de Estudios Alicantinos* 33: 23-33.
- LLOBREGAT, E A (1988) "Dos inscripciones griegas, altimperiales, del Tossal de Manises, Alicante" in *Homenaje a Garcia y Bellido Anejos de Gerion* 1: 351-358.
- LLOPIS LLOPIS, J (1948) "Exploraciones en una estación romana de Gandía" in *Saitabi* 6: 48-55.
- LLOYD, J A (1979) *Excavations at Sidi Khrebish, Benghazi (Berenice)* Vol 2 (Tripoli).
- LOPEZ MONTEAGUDO, G (1978) "Panorama actual de la Colonizacion Griega en la Peninsula Iberica" in *AEA* 50-51: 3-14.
- LOPEZ MULLOR, A (1985) "Excavaciones en la Villa Romana del Roser de Calella (El Maresme, Barcelona). Campanas de 1981 y 1982" in *Empuries* 47: 179-203.

- LOPEZ MULLOR, A and FIERRO MACIA, J (1994) "Un horno con ánforas de tipo Púnico-Ebusitano hallado en Darró (Vilanova i la Geltrú, Barcelona)" in *El Mundo Púnico, historia, sociedad y cultura* Coloquios de Cartagena 1 (Cartagena): 443-463.
- LOPEZ PARDO, F (1990) "Nota sobre las ánforas II y III de Kuass (Marruecos)" in *Antiquités Africaines* 26: 13-23.
- LOUSTAUD, J-P (1984) "Douverte a Limoges de deux amphores de M.Porcus et Sex.Domitius/Saturio" in *Aquitania* 2: 277-283.
- LUZÓN NOGUÉ, J Ma (1962) "Tartessos y la Riá de Huelva" in *Zephyrus* 13: 97-104.
- MACKENDRICK, P (1969) *The Iberian Stones speak* (London).
- MACKENDRICK, P (1971) *Roman France* (London).
- MACMULLEN, R (1968) "Rural Romanization" in *Phoenix* 22: 337-341.
- MALUQUER DE MOTES, J (1963a) "La colonia griega de Rhode, localizada" in *Zephyrus* 14:99-100.
- MALUQUER DE MOTES, J (1963b) "Dos grafitos ibericos con nombres latinos" in *Zephyrus* 14:108-110.
- MANACORDA, D (1977) "Anfore Spagnole a Pompei" in *L'Instrumentum Domesticum di Ercolano e Pompei* (Rome) Quaderni di Cultura Materiale 1: 121-132.
- MANGAS, J and ROSARIO HERNANDO, M<sup>a</sup> (1990) "La Sal y las relaciones intercomunitarias en la Peninsula Ibérica durante la Antigüedad" in *Memorias de Historia Antigua* 11-12: 219-231.
- MANIATIS, Y, JONES, R E, WHITBREAD, I K, KOSTIKAS, A, SIMOPOULOS, A, KARAKALOS, CH and WILLIAMS, C K (1984) "Punic amphoras found at Corinth, Greece: an investigation of their origin and technology" in *JFA* 11.2: 205-222.
- MANTILLA COLLANTES, A (1987) "Marcas y anforas romanas encontradas en Saguntum" in *Saguntum* 21: 379-416.
- MARIN DIAZ, Ma A (1988) *Emigracion, Colonizacion y Municipalizacion en la Hispania Republicana* (Granada).
- MARINER BIGORRA, S (1954) "Notas de Epigrafia Valenciana" in *APL* 5: 225-249.
- MARTIN, G and SALUDES, J (1966) "Hallazgos arqueologicos submarinas en la zona de El Saler (Valencia)" in *APL* 11: 155-169.

- MARTIN, G (1969) "Consideraciones sobre la Terra Sigillata Hispanica, Mauretania y la Sigillata Clara en Marruecos" in *PLAV* 6: 151-175.
- MARTIN, G (1970) "Las Pesquerias Romanas de la Costa de Alicante" in *PLAV* 10: 139-153.
- MARTIN, G and SERRES, Ma D (1970) *La Factoria pesquera de la Punta de l'Arenal y otros restos romanos de Javea (Alicante)* in TV del SIP 38 (Valencia).
- MARTIN, M A, NIETO, F J and NOLLA, J M (1979) *Excavaciones en la Ciudadela de Roses (campana 1976 y 1977)* (Gerona).
- MARTÍN CAMINO, M, ÁNGELES PÉREZ BONET, M<sup>a</sup> and ROLDÁN BERNAL, C (1991) "Contribución del área portuaria de Carthago Nova y su tráfico marítimo en época altoimperial" in *AEA* 64: 272-283.
- MARTÍN ECHEVERRÍA, L (1937) *Geografía del España* 3 vols (Barcelona).
- MARTÍN ECHEVERRÍA, L (1940) *España, El Pais y los Habitantes* (Mexico).
- MARTIN-KILCHER, S (1987) *Die Römischen Amphoren aus Augst und Kaiseraugst. Forschungen in Augst* 7/1 (Augst).
- MARTIN-KILCHER, S (1990) "Fishsaucen und Fishkonserven aus dem romischen Gallien" in *Archaeologie der Schweiz* 13: 37-44.
- MARTÍNEZ MAGANTO, J (1994) "El litoral del SE peninsular en época Romana. Algunas cuestiones en torno a su explotación económica y comercial" in *Gerion* 12: 197-213.
- MAS, J (1985a) "El Polígono Submarino de Cabo de Palos. Sus Aportaciones al estudio del trafico maritimo antiguo" in *VI CIAS*, Cartagena 1982 (Cartagena): 153-171.
- MAS, J (1985b) "Excavaciones en el yacimiento submarino de San Ferreol (Costa de Cartagena)" in *VI CIAS*, Cartagena 1982 (Cartagena): 189-223.
- MASCORT, M, SANMARTI GREGO, E and SANTACANA, J (1991) "Aldovesta. Les bases d'un modèle commercial dans le cadre de l'expansio Phénicienne au Nort-Est de la Peninsulé Ibérique" in *Atti del II Congresso Internazionale di Studi Fenici e Punici* Roma, 9-14 Novembre 1987 (Rome): 1073-1079.

- MATA PARRENO, C (1991) "La Cerámicas Fenicias occidentales de los Villares (Caudate de las Fuentes, Valencia) in *Atti del II Congresso Internazionale di Studi Fenici e Punici* Roma, 9-14 Novembre 1987 (Rome): 1081-1090.
- MATEU Y LLOPIS, F (1973) "Bronces romanos imperiales y vandalos en l'Illa de Cullera" in *APL* 13: 241-256.
- MATTHEWS, J F (1984) "The Tax law of Palmyra: Evidence for Economic History in a city of the Roman East" in *JRS* 74: 157-180.
- MATTINGLY, D J (1988) "Oil for export? A comparison of Libyan, Spanish and Tunisian olive oil production in the Roman Empire" in *JRA* 1: 33-56.
- MCCANN, A M (1979) "The Harbor and Fishery remains at Cosa, Italy" in *JFA* 6: 391-411.
- MCCANN, A M (1987) *The Roman Port and Fishery of Cosa* (Princeton).
- MCELDERRY, R K (1918) "Vespasian's reconstruction of Spain" in *JRS* 8:53-102.
- MELE, A (1979) *Il commercio greco-arcaico: prexis ed emporie* (Naples).
- MENENDEZ I PABLO, X and SOLIAS I ARIS, J Ma (1985) "Problemes entorn del Baix Imperi al curs inferior del Llobregat" in *Pyrenae* 21: 157-167.
- MESQUITA DE FIGUEIREDO, A (1906) "Ruines d'antiques établissements a salaisons sur le littoral sud de Portugal" in *Bulletin Hispanique* 8.2: 109-121.
- MEZQUIRIZ DE CATALAN, M A (1961) *Terra Sigillata Hispánica*. 2 vols (Valencia).
- MILES, G C (1952) *The Coinage of the Visigoths in Spain: Leovigild to Achila II* Hispanic Numismatic Series no. 2 (New York).
- MIRET, M, SANMARTI, J and SANTACANA, J (1991) "From indigenous structures to the Roman world: Models for the occupation of central coastal Catalunya" in Barker, G and Lloyd, J *Roman Landscapes*: 47-53.
- MIRÓ I CANALS, J (1981) "Les marques <C.Mussidi Nepotis> i <Philodamus> i la produccio d'amfores Dressel 28 i Dressel 7/11 a Catalunya" in *Pyrenae* 17-18: 335-342.
- MIRÓ I CANALS, J (1983) "Algunas consideraciones sobre las ánforas Ibéricas Mañá B 3" in *Pyrenae* 19-20: 157-189.

- MIRÓ I CANALS, J (1985) "El Litoral Catalan: Navegacion, materiales arqueologicos submarinos e interpretacion comercial en epoca antigua" in *VI CIAS*, Cartagena 1982 (Cartagena): 455-461.
- MIRÓ I CANALS, J, PALLARES I COMAS, R and GARCIA I ALONSO, F (1987) "Una aportacion al conocimiento de la produccion anforica Romana en Tarragona. El horno de l'Aumedina, Tivissa (Ribera d'Ebre, Tarragona)" in *CPAC* 13: 275-287.
- MIRÓ I CANALS, J (1988) *La Produccion de anforas Romanas en Catalunya: un estudio sobre el comercio de vino de la Tarraconense* BAR Int Ser 473. (Oxford).
- MIRÓ I CANALS, J (1989) "Ánforas arcaicas en el litoral Catalán. Un estudio acerca de las primeras importaciones de vino en Cataluña (625-500 a.C)" in *AEA* 62: 21-70.
- MIRÓ I CANALS, J (1991) "Un conjunto de anforas tardo-republicanas de un silo del poblado iberico de Burriac (Cabrera de Mar, Barcelona)" in *Saguntum* 24: 53-67.
- MODRZEWSKA, I (1993) "Alcuni Segni e Bolli di Anfore Scelte della laguna di Venezia" in *BSAA* LIX: 171-177.
- MODRZEWSKA, I and PIANETTI, F (1994) "Anfore Spagnole del deposito di Verona (Italia). Interpretazione dei dati analitici" in *AEA* 67: 147-155.
- MOREL, J-P (1966) "Les Phoceens en Occident: certitudes et hypothesis" in *PP* 21: 378-420.
- MORENA PARAMO, A and ABAD CASAL, L (1970) "Aportaciones al estudio de la pesca en la antigüedad" in *Habis* 1-2: 209-221.
- MORERE, N (1991) "L'exploitation romaine du sel dans le region de Sigüenza" in *Alimenta. Homenaje al Dr Michel Ponsich* Anejos de Gerion III: 223-235.
- MORERE, N (1994) "La Sal en la Peninsula Iberica. Los testimonios literarios antiguos" in *Hispania Antiqua* 18: 235-250.
- MOSCATI, S (1968) *The World of the Phoenicians* (New York).
- MUNOZ VICENTE, A, DE FRUTOS REYES, G and BERRIATUA HERNANDEZ, N (1987) "Contribucion a los origenes y difusion comercial de la industria pesquera y conservera Gaditana a traves de la recientes aportaciones de las factorias de salazones de la Bahia de Cadiz" in *Congreso Internacional El Estrecho de Gibraltar* (Ceuta): 487-508.

- NAROLL, R (1962) "Floor area and settlement population" in *American Antiquity* 27.4: 587-9.
- NENQUIN, J (1961) *Salt. A study in economic prehistory*. Dissertationes Archaeologicae Gandenses 6 (Brugge).
- NICHOL, R K (1982) "Seasonal dating from fish frequencies" in *JAS* 9: 391-3.
- NICHOL, R K and WILD, C J (1984) "'Numbers of Individuals' in Faunal Analysis: the decay of fish bone in archaeological sites" in *JAS* 11: 35-51.
- NICOLAOU, K and FLINDER, A (1976) "Ancient Fish tanks at Lapithos, Cyprus" in *IJNA* 5.2: 133-141.
- NIEMEYER, H G (1980) "Auf der suche nach Mainake: der konflikt zwischen literarischer und archäologischer überlieferung" in *Historia* 29.2: 165-189.
- NIEMEYER, H-G (1990) "The Phoenicians in the Mediterranean: a non-Greek model for expansion and settlement in Antiquity" in Descoedres, J-P (ed.) *Greek Colonists and Native Populations: Proceedings of the First Australian Congress of Classical Archaeology held in honour of Emeritus Professor A.D. Trendall* (Oxford): 469-490.
- NIETO PRIETO, F J (1981) "Acerca del progresivo despoblamiento de Ampurias" in *RSL* 47.1-4: Omaggio a Nino Lamboglia 5: 35-51.
- NIETO PRIETO, F J and NOLLA, J Ma (1985) "El yacimiento arqueologico submarino de Riells-la Clota y su relacion con Ampurias" in *Cypsela* 5: 143-162.
- NIETO PRIETO, F J (1993) "De la Dragendorff 29 a la Hayes 8: consideraciones sobre el comercio maritimo en los siglos I y II d C" in *Cypsela* 10: 77-85.
- NOLLA, J Ma (1974) "Las anforas romanas de Ampurias" in *Ampurias* 36: 147-197.
- NOLLA, J Ma and NIETO PRIETO, F J (1981) "Una factoria de salao de peix a Roses" in *Fonaments* 3: 187-200.
- NOLLA, J Ma (1984) "Excavaciones recientes en la ciudadela de Rosas: el edificio bajo-imperial" in Keay, S J, Jones, R F J and Blagg, T *Papers in Iberian Archaeology* BAR Int Ser 193: 430-450.
- NOLLA, J Ma (1987) "Una nova amfóra Catalana: La Tarraconense 1" in *El Vi a l'Antiguitat Economia, Produccio i Comerc al Mediterrani Occidental Actes I Colloqui d'Arqueologia Romana* (Museo de Badalona) Monografies Badalonines num 9: 217-223.

- NOLLA, J Ma and SANMARTI, E (1988) *Ampurias* (Gerona).
- NOLLA, J Ma and CASAS, J (1990) "El material ceramic d'importacio de la villa romana de Puig Rodon (Corca, Baix Emporda), d'epoca severiana a la Baixa Antiguitat" in *Cypsela* 8: 193-218.
- OLIVER, J H (1956) "A Spanish corporation and its patrons" in *Eos* 48: 447-54.
- OLIVER FOIX, A J (1981) "La presencia Fenicia y Púnica al sur de las Bocas del Ebro" in *Atti del II Congresso Internazionale di Studi Fenici e Punici* Roma, 9-14 Novembre 1987 (Rome): 1091-1101.
- OLMOS ROMERA, R (1982) "La ceramica griega en el sur de la Peninsula Iberica" in *PP* 37: 393-406.
- ORTON, C, TYERS, P and VINCE, A (1993) *Pottery in archaeology* (Cambridge).
- OSWALD, F and DAVIES PRYCE, T (1970) *An introduction to the study of Terra Sigillata* (London).
- PADILLA MONGE, A (1989) *La Provincia Romana de la Betica (253-422)* (Sevilla).
- PALLARES, J R (1991) *The Ecology of the Ancient Greek World* (London).
- PALLARES, R, GRACIA, F and MUNILLA, G (1987) "El desarrollo del comercio del vino en el curso inferior del Ebro entre los siglos IV a.C y III d.C" in *El Vi a l'Antiguitat Economia, Produccio i Comerc al Mediterrani Occidental* Actes I Colloqui d'Arqueologia Romana (Museo de Badalona) Monografies Badalonines num 9: 17-30.
- PANELLA, C (1975) "Per uno studio delle Anfore di Pompei: le Forme VIII e X della tipologia di R.Schoene" in *Studia Miscellanei* 22: 151-164.
- PAOLI, V (1940) *Rome, its People, Life and Customs* (English Translation 1963) (London).
- PARASKEVAIDOU, H A (1991) "The Name of the Phoenician: some consideration" in *Atti del II Congresso Internazionale di Studi Fenici e Punici* Roma, 9-14 Novembre 1987 (Rome): 523-528.
- PARASSOGLU, G M (1987) "A lease of Fishing Rights" in *Aegyptus* 67: 89-93.
- PAREJA, F (1972) "Marques sur une amphora de l'île de Fraile (Aguilas)" in *Cahiers d'Archeologie Subaquatique* 1: 107-108.
- PARIS, P (1906) "Le Trésor de Jávea" in *Revue Archeologique* 4th Ser. 8: 424-434.

- PARKER, A J (1974) "Lead ingots from a Roman ship at Ses Salines, Majorca" in *IJNA* 3.1: 147-150.
- PARKER, A J and SQUIRE, D M (1974) "A wreck of the late Second Century AD at Terrauzza" in *IJNA* 3.1: 27-34.
- PARKER, A J (1977) "Lusitanian Amphoras" in *Methodes Classiques et Methodes Formelles dans l'etude des Amphores*, Ecole Francaise de Rome (Rome): 35-43.
- PARKER, A J and PRICE, J (1981) "Spanish exports of the Claudian Period: the significance of the Port Vendres II wreck reconsidered" in *IJNA* 10.3: 221-228.
- PARKER, A J (1984) "Shipwrecks and ancient trade in the Mediterranean" in *Archaeological Review from Cambridge* 3.2: 99-113.
- PARKER, A J (1992a) "Review article: Underwater Archaeology in Catalonia and the Balearic Islands" in *IJNA* 21.3: 273-275.
- PARKER, A J (1992b) "Cargoes, containers and stowage: the ancient Mediterranean." in *IJNA* 21.2: 89-100.
- PARKER, A J (1992c) *Ancient Shipwrecks of the Mediterranean and the Roman Provinces* BAR Int Ser 580. (Oxford).
- PASCUAL GUASH, R (1960) "Dos anforas del Pecio Gandolfo (Almeria)" in *Zephyrus* 11: 205-209.
- PASCUAL GUASH, R (1966) "La nave romana de El Golfet (Gerona)" in *Ampurias* 28: 262-265.
- PASCUAL GUASH, R (1968) "Acerca de la fabricacion de anforas" in *Ampurias* 30: 237-248.
- PASCUAL GUASH, R (1969) "Un nuevo tipo de anfora punica" in *AEA* 42: 12-19.
- PASCUAL GUASH, R (1973) "Underwater archaeology in Andalusia (Almeria and Granada)" in *IJNA* 2.1: 107-119.
- PASCUAL GUASH, R (1974) "Sobre un estampilla anforica de Ampurias" in *Miscelanea Arqueologica* 2: 139-144.
- PASCUAL GUASH, R (1975) "El pecio de Columbretes" in *CPAC* 2: 184-190.
- PASCUAL GUASH, R (1977) "Las anforas de la Layetania" in *Methodes Classiques et Methodes Formelles dans l'etude des amfores*: 47-96.

- PASCUAL GUASH, R (1980) "Sobre algunas marcas anforicas Catalanas" in *RSL* 46, no.1-3: 261-279.
- PASCUAL GUASH, R (1981a) "Les Marques Amforiques CLV i CHR" in Museo Municipal de Mataro *Laietania: Estudis d'Arqueologia del Maresme*: 197-199.
- PASCUAL GUASH, R (1981b) "Exploración submarina entre Llavaneres y Mataró (Barcelona)" in *Ampurias* 43: 217-251.
- PASCUAL GUASH, R (1984) "The Catalan Wine Trade in the Roman Empire" in *IJNA* 13: 245-248.
- PATERSON, J (1982) "Salvation from the Sea: amphora and trade in the Roman West" in *JRS* 72: 146-157.
- PATERSON, J (1991) Introduction to "Agrarian structures on the Lowlands" in Barker, G and Lloyd, J *Roman Landscapes*: 133-134.
- PEACOCK, D P S (1974) "Amphora and the Baetican fish industry" in *Ant J* 54: 232-243.
- PEACOCK, D P S (1978) "The Petrological Method: Problems and Approaches in the Roman Mediterranean" in University of Bradford *Symposium in Archaeological Sciences*.
- PEACOCK, D P S (1982) *Pottery in the Roman World: an ethnoarchaeological approach*. (London).
- PEACOCK, D P S and WILLIAMS, D F (1986) *Amphorae and the Roman Economy* (London).
- PEIXOTO CABRAL, J M, MEIRELES, J M, MONGE SOARES, A M and VERISSIMO, L (1990) "Datacao pelo radiocarbono de um cepo de ancora em chumbo encontrado na Berlenga" in *Conimbriga* 29: 59-68.
- PELICHET, E (1946) "A propos des amphores romaines trouvees a Nyon" in *Zeitschrift fur Schweizerische Archaeologie und Kunstgeschichte* 8: 189-202.
- PELLICER CATALAN, M (1962) *Excavaciones en la necrópolis púnica 'Laurita' del Cerro de San Cristóbal (Almuñécar, Granada)* EAE 17 (Madrid).
- PEMAN, C (1948) "Nuevas precisiones sobre vias Romanas en la Provincia de Cadiz" in *AEA* 21: 255-268.

- PEMAN, C (1959) "Alfares y embarcaderos Romanos en la Provincia de Cadiz" in *AEA* 32: 169-173.
- PEREIRA MENAUT, G (1979) *Inscripciones romanas de Valentia* TV del SIP 64 (Valencia).
- PILAR SERRANO, M (1960) "Anforas Romanos con la marca 'Sestius'" in *AEA* 33: 113-122.
- PILAR SERRANO, M (1963) "Anforas Romanas en las Costas de Mallorca" in *AEA* 36: 207-210.
- PONSICH, M and TARRADELL, M (1965) *Garum et les industries antiques de salaison dans la Mediterranee Occidental* (Paris).
- PONSICH, M (1969a) "Les ceramiques d'imitation: la Campanienne de Kouass" in *AEA* 42: 56-80.
- PONSICH, M (1969b) "Note préliminaire sur l'industrie de la céramique Préromaine en Tingitania" in *Karthago* 15: 75-97.
- PONSICH, M (1976) "A propos d'une usine antiques de salaison a Belo" in *MCV* 12: 69-79.
- PONSICH, M (1988) *Aceite de Oliva y Salazones de Pescado: Factores Geo-Economicos de Betica y Tingitania* (Madrid).
- PRADALES CIPRES, D (1989) "El comercio de Terra Sigillata en el Pais Valenciano: nuevos datos" in *Hispania Antiqua* 13: 71-96.
- PREVOSTI, M and CLARIANA, J F (1987) "El Taller de anforas de Torre Llauder: nuevas aportaciones" in *El Vi a l'Antiguitat Economia, Produccio i Comerc al Mediterrani Occidental* Actes I Colloqui d'Arqueologia Romana (Museo de Badalona) Monografies Badalonines num 9: 199-210.
- PREVOSTI, M (1991) "The establishment of the Villa system in the Maresme (Catalonia) and its development in the Roman period" in Barker, G and Lloyd, J *Roman Landscapes*: 135-141.
- PRITCHARD, J B (1978) *Recovering Sarepta, a Phoenician City: Excavations at Sarafand, Lebanon, 1969-1974, by the University Museum of the University of Pennsylvania* (Princeton).

- PUERTA, C and RODRIGUEZ, M (1987) "Una industria urbana de producció de vi a Baetulo (Badalona)" in *El Vi a l'Antiguitat Economia, Producció i Comerc al Mediterrani Occidental* Actes I Colloqui d'Arqueologia Romana (Museo de Badalona) Monografies Badalonines num 9: 183-188.
- PURCELL, N (1985) "Wine and Wealth in Ancient Italy" in *JRS* 75: 1-19.
- PURPURA, G (1982) "Pesca e stabilimenti antichi per la lavorazione del pesce in Sicilia: I-S.Vito (Trapani), Cala Minnola (Levanzo)" in *Sicilia Archaeologica* 15.48: 45-60.
- RABAN, A (1980) "The Siting and Development of Mediterranean Harbors in Antiquity" in Sears, M and Merriman, D *Oceanography in the Past* (New York): 750-764.
- RABANAL, M A and ABASCAL PALAZÓN, J M (1985) "Inscripciones Romanas de la Provincia de Alicante" in *Lucentum* 4: 191-244.
- RADCLIFFE, W (1921) *Fishing from the Earliest Times* (London).
- RALSTON, I (1989) "Greeks, Romans and Barbarians: Barry Cunliffe" in *Scottish Archaeological Review* 6.
- RAMALLO ASENSIO, S F (1984) "Algunas consideraciones sobre el Bajo Imperio en el litoral Murciano: Los hallazgos romanos en Aguilas" in *Anales de la Universidad de Murcia* 42. 3-4: 97-124.
- RAMALLO ASENSIO, S F (1985) "Envases para Salazones en el Bajo Imperio (I)" in *VI CIAS*, Cartagena 1982 (Cartagena): 435-442.
- RAMALLO ASENSIO, S F (1989) *La Ciudad Romana de Carthago Nova: la Documentacion Arqueologica* (Universidad de Murcia).
- RAMALLO ASENSIO, S F and RUIZ VALDERAS, E (1994) "Un edículo Republicano dedicado a Atargatis en Carthago Nova" in *AEA* 67: 79-102.
- RAMON TORRES, J (1985) "Togomago I: Un pecio Fenicio del siglo Va.C en aguas en Ibiza" in *VI CIAS*, Cartagena 1982 (Cartagena): 377-391.
- RAMON TORRES, J (1987) "Sobre los tipos antiguos de las anforas Mañá A" in *CPAC* 13: 181-203.

- RAMOS FERNÁNDEZ, R (1995) *Museo Arqueológico Municipal de Elche 'Alejandro Ramos Folgués'* Arqueologia Serie Minor 22, Generalitat Valenciana (Valencia).
- RATHBONE, D W (1983) "The Slave Mode of Production in Italy" Review article of Giardina, A and Schiavone, A (eds) "Societa Romana e Produziones Schiavistica." Vols 1-3 in *JRS* 73: 160-168.
- RECIO RUIZ, A (1993) "Vestigios materiales cerámicos de ascendencia Fenicio-Púnica en la Provincia de Malaga" in *MM* 34: 127-141.
- REECE, R (1981) "The Third Century: crisis or change?" in King, A and Henig, M (eds) *The Roman West in the Third Century. Contributions from Archaeology and History* BAR Int Ser 109: 27-38.
- REESE, D S (1980) "Industrial exploitation of Murex Shells: Purple Dye and Lime production at Sidi Khrebish, Benghazi (Berenice)" in *Libyan Studies* 11: 79-93.
- REMESAL RODRÍGUEZ, J (1990) "El sistema annonario como base de la evolución económica del Imperio Romano" in *PACT* 27: 355-367.
- REMONDON, R (1954) "Un nouveau document concernant Probus" in *RPh* 28.2: 199-210.
- RENÉ-LECLERC, M (1905) "Les Salines de Tanger" in *Archives Marocaines* 5: 276-282.
- REVILLA CALVO, V (1993) *Produccion ceramica y economia rural en el Bajo Ebro en Epoca Romana: el alfar de l'Aumedina, Tivissa (Tarragona)*. (Barcelona).
- REVILLA CALVO, V (1994) "El alfar romano de Tomoví. Producción anfórica y agricultura en el área de Tarraco" in *Bulletí Arqueològic* 16: 111-128.
- REYNOLDS, P (1993) *Settlement and Pottery in the Vinalopó valley (Alicante, Spain) AD 400-700*. BAR Int Ser 588 (Oxford).
- REYNOLDS, P (1995) *Trade in the Western Mediterranean, AD 400-700: the ceramic evidence*. BAR Int Ser 604 (Oxford).
- RIBAS BERTRAN, M (1963) *La Villa Romana de Torre Llauder de Mataro* EAE 47 (Madrid).
- RIBAS BERTRAN, M (1983) "Un taller d'amfores o Mataro" in *Pyrenae* 19-20: 281-285.

- RIBERA LACOMBA, A and RIPOLLES ALEGRE, P (1977) "Anforas de Benicarlo y su zona costera" in *CPAC* 4: 159-173.
- RIBERA LACOMBA, A and FERNANDEZ IZQUIERDO, A (1985) "Prospecciones Arqueologicas submarinas en la zona del Saler (Valencia)" in *VI CIAS*, Cartagena 1982 (Cartagena): 83-91.
- RIBERA LACOMBA, A (1989) "Marcas de Tierra Sigillata del Tossal de Manises" in *Lucentum* 7-8: 171-204.
- RICHARDSON, J S (1976) "The Spanish Mines and the Development of Provincial Taxation" in *JRS* 66: 139-152.
- RICHARDSON, J S (1983) "The 'Tabula Contrebiensis': Roman law in Spain in the Early First Century BC" in *JRS* 73: 1-19.
- RICHARDSON, J S (1996) *The Romans in Spain* (Oxford).
- RICHMOND, I A (1931) "The Town Walls in Hispania Citerior" in *JRS* 21: 86-100.
- RICKARD, T A (1928) "The Mining of the Romans in Spain" in *JRS* 18: 129-143.
- RICO, C (1993) "Production et diffusion des matériaux de construction en terre cuite dans le monde Romaine: l'exemple de la Tarraconaise d' après l' épigraphie" in *MCV* 29.1: 51-86.
- RICO, C (1995) "Índex de les marques epigràfiques sobre tegulae romanes de Catalunya i el país Valencià (antigua Tarraaconensis)" in *Saguntum* 28, Homenatge al Professor Dr Miquel Tarradell i Mateu: 197-215.
- RIDGWAY, D (1992) *The First Western Greeks* (Cambridge).
- RIDGWAY, D and SERRA RIDGWAY, F R (1992) "Sardinia and History" in Tykot, R H and Andrews, T K (eds) *Sardinia in the Mediterranean: a footprint in the Sea* (Sheffield) Studies in Sardinian Archaeology presented to Miriam S. Balmuth: 355-363.
- RIDGWAY, D (1994) "Phoenicians and Greeks in the West: a view from Pithekoussai" in Tsetschladze, G R and De Angelis, F (ed) *The Archaeology of Greek Colonization: Essays dedicated to Sir John Boardman* (Oxford): 35-46.
- RIEHM, K (1961) "Prehistoric Salt Boiling" in *Antiquity* 35: 181-191.
- REINHOLD, M (1970) *History of Purple as a Status Symbol in Antiquity* (Collection Latomus, Vol. 116, Brussels).

- RINGROSE, D R (1970) *Transportation and economic stagnation in Spain, 1750-1850* (Durham NC).
- RIPOLL PERELLO, E (1990) "Orígenes de la ciudad romana de Ampurias" in *Gerion* 8: 163-210.
- RIVERA, A (1945) *Geografía de España*. (Madrid).
- RODRIGUEZ TEMINO, I (1990) "Hallazgos de dos ánforas con 'tituli picti' en Ecija (Sevilla)." in *AEA* 63: 292-5.
- ROMAN, Y (1982) "Les amphores de M.Porcus constat d'une divergence et plaidoyer pour une analyse physique et chimique." in *Actes du 104e Congrès National des Sociétés Savantes*: 81-5.
- ROSE, V (1874) "Aringus, der Hering." in *Hermes* 8: 224-227.
- ROSELLO MESQUIDA, M (1992) "Fragmento de cerámica decorada de época bizantina de origen oriental hallada en la Almoina (Valencia)" in *Saguntum* 25: 223-226.
- ROSSER LIMIÑANA, P (1991) "La necrópolis Romana alto-imperial del 'Parque de las Naciones' (Albufereta, Alicante): estudio de alguno de sus materiales" in *Lucentum* 9-10: 85-101.
- ROSSER LIMIÑANA, P (1992) "La cerámica tardorromana de producción Africana en las excavaciones arqueológicas del término municipal de Alicante" in *Tabona* 8.2: 535-552.
- ROSSER LIMIÑANA, P (1994) "Nuevas aportaciones a la problemática de la Antigüedad Tardía en Alicante" in *LQNT* 2: 69-110.
- ROSSITER, J J (1981) "Wine and Oil processing at Roman farms in Italy" in *Phoenix* 35: 345-361.
- ROSTOVTZEFF, M (1902) *Geschichte der Staatspacht in der Römischen Kaiserzeit bis Diokletian* (Leipzig).
- ROSTOVTZEFF, M (1957) *The Social and Economic History of the Roman Empire* (Oxford).
- ROUILLARD, P (1982) "Les Colonies Grecques du Sud-Est de la Péninsule Ibérique" in *PP* 37: 417-431.

- ROUILLARD, P (1991) *Les Grecs et la Peninsule Iberique du VIIIe au IVe siecle avant Jesus-Christ* (Paris).
- RUIZ ACEVEDO, J M and DELGADO BEJAR, F (1992) "Abastecimiento de agua a las Cuidades Hispanorromanas" in *Revista de Arqueologia* XIII.139: 36-47.
- RUIZ GIL, J A (1991) "Cronología de las factorías de salazones púnicas de Cádiz" in *Atti del II Congresso Internazionale di Studi Fenici e Punici* Roma, 9-14 Novembre 1987 (Rome): 1211-1214.
- RUIZ MATA, D (1981) "El poblado metalúrgico de época tartésica de San Bartolomé (Almonte, Huelva)" in *MM* 2: 154-156.
- RUIZ RODRIGUEZ, A, MOLINAS, M and CASTRO LOPEZ, M (1991) "Settlement and continuity in the territory of the Guadalquivir Valley (6th Century BC-1st Century AD)." in Barker, G and Lloyd, J *Roman Landscapes*: 29-36.
- SAGREDO, L (1985) "Las Invasiones del siglo III d.C en Hispania a la luz de los tesorillos monetales" in *Hispania Antiqua* 11-12: 89-104.
- SALVA, A (1969) "Las importaciones de ceramica atica lisa en La Albufereta de Alicante. Estudio comparativo" in *PLAV* 6: 133-6.
- SANCHEZ FERNANDEZ, C (1987) "Anforas Masaliotas de la Costa Levantina. Nuevas adquisiciones del Museo Arqueologico Nacional" in *AEA* 60: 221-229.
- SANCHEZ FERNANDEZ, Ma J and LOBREGAD COLLADO, Ma T (1984) "Estudio preliminar sobre las anforas Romanas del Portus Illicitanus" in *Lucentum* 3: 135-151.
- SANCHEZ FERNANDEZ, Ma J, BLASCO, E and GUARDIOLA, A (1989) "Descubrimiento de una factoria bajoimperial de salazon de pescado en Santa Pola (Alicante)" in *Saguntum* 22: 413-441.
- SANMARTI GREGO, E (1982) "Les influences Mediterraneenes au Nord-Est de la Catalogne a L'Epoque Archaïque et la response indigene" in *PP* 37: 281-303.
- SANMARTI GREGO, E (1983) "Sobre un nuevo tipo de Anfora de Epoca Republicana, de origen presumiblemente Hispanico" in *Ceramiques Greques, Hellenistiques a la Peninsula Iberica* Empuries 18-20 March 1983: 133-141.
- SANMARTI GREGO, E and SANTIAGO, R A (1987) "Une lettre grecque sur plomb trouvée à Emporion" in *ZPE* 68: 119-127.

- SANQUER, R and GALLIOU, P (1972) "Garum, sel et salaisons en Amorieque Gallo-Romaine" in *Gallia* 30: 199-223.
- SANTOS VELASCO, J A (1994) "City and State in Pre-Roman Spain: the example of Illici" in *Antiquity* 68: 289-299.
- SANZ I MARTINEZ, M (1975) "Hallazgos romanos en Reus" in *Bolletín Arqueológico* IV 129-132: 112-115.
- SCHUBART, H, FLETCHER VALLS, D and OLIVER Y DE CARDENAS, J (1962) *Excavaciones en las Fortificaciones del Montgo cerca de Denia (Alicante)* Excavaciones Arqueológicas en España 13 (Madrid).
- SCHUBART, H, NIEMEYER, H-G and PELLICER CATALAN, M (1969) *Toscanos: la Factoria paleopúnica en la desembocadura del río de Vélez* EAE 66 (Madrid).
- SCHUBART, H (1975) "Las Excavaciones de Torre del Mar y el panorama arqueológico de las fundaciones de Colonias Fenicias en la Costa Mediteranea de la Peninsula Iberica" in *PLAV* 11: 199-206.
- SCHUBART, H (1982) "Phönizische Niederlassungen an der Iberischen Südküste" in Niemeyer, H G (ed.) *Phönizier im Westem* (Mainz): 207-231.
- SCHULTEN, A and BOSCH-GIMPERA, P (1922) *Fontes Hispaniae Antiquae* Vol 1 (Barcelona).
- SCHULTEN, A (1927) "Forschungen in Spanien" in *AA*: 197-235.
- SCULLARD, H H (1930) *Scipio Africanus in the Second Punic War* (Cambridge).
- SEALEY, P R (1985) *Amphorae from the 1970 excavations at Colchester Sheepen* BAR Brit Ser 142 (Oxford).
- SEGARRA LLAMAS, J (1947) "La Isla de Portitchol (Javea)" in *Saitabi* 7: 70-72.
- SEMPLE, E C (1932) *The Geography of the Mediterranean region* (London).
- SENENT IBANEZ, J J (1947) "En torno a Hemeroskopeion" in *Cronicas del III Congreso Arqueológico del Sudeste Espanol* (Murcia): 239-245.
- SENTANDREU GIMENO, M C (1966) "La Necropolis romana de 'Les Foies' (Manuel, Valencia)" in *APL* 11: 197-202.
- SERRA RAFOLS, J C (1944) *La Vida en Espana en la Epoca Romana* El Mundo y los Hombres 3 (Barcelona).

- SHAW, B D (1981) "Rural markets in North Africa and the Political Economy of the Roman Empire" in *Antiquités Africaines* 17: 37-83.
- SHEFTON, B B (1982) "Greeks and Greek Imports in the South of the Iberian Peninsula. The Archaeological Evidence" in Niemeyer, H G (ed.) *Phönizier im Westem* (Mainz): 337-368.
- SHEFTON, B B (1994) "Massalia and Colonization in the North-Western Mediterranean" in Tsetskhladze, G R and De Angelis, F (eds) *The Archaeology of Greek Colonization. Essays dedicated to Sir John Boardman* (Oxford) p 61-86.
- SINGER, C, HOLMYARD, E J and HALL, A R (1954) *A History of Technology* Vol I (Oxford).
- SINOPOLI, C M (1991) *Approaches to Archaeological Ceramics*. (New York).
- SIVAN, H S (1985) "An unedited letter of the Emperor Honorius to the Spanish soldiers" in *ZPE* 61: 273-281.
- SIVAN, H S (1993) *Ausonius of Bordeaux: Genesis of a Gallic aristocracy* (London).
- SOLIAS I ARIS, J Ma (1985) "Introduccio a l'Estudi de les activitats econòmiques d'una villa Laietana" in *Pyrenae* 21:113-121.
- SOLOVERA SAN JUAN, M E (1987) *Estudios sobre la Historia Economica de la Rioja Romana*. Instituto de Estudios Riojanos. Historia 7 (Logroño).
- SOTOMAYOR, M (1971) "Nueva factoria de salazones de pescado en Almunecar" in *NAH* 15: 147-178.
- SPAAR, S L (1993) "Tracing the Ancient Spanish Coastline: the search for underwater sites" in *The Ancient World* 24.2 p 107-129.
- SPANN, P (1987) *Quintus Sertorius and the Legacy of Sulla* (Arkansas).
- SPERBER, D (1968) "Some observations of Fish and Fisheries in Roman Palestine" in *Zeitschrift der Deutschen Morgenlandischen Gesellschaft* 118: 265-269.
- SPERBER, D (1991) *Roman Palestine 200-400: Money and Prices*. Bar-Ilan Studies in Near Eastern Languages and Culture (Jerusalem).
- SWAN, V G (1984) *The Pottery kilns of Roman Britain* RCHME Supplementary Series 5 (London).

- TABORELLI, L (1992) "Sulle 'Ampullae Vitreae' Spunti per l'approfondimento della loro problematica nell'ottica del rapporto tra contenitore e contenuto" in *Archaeologia Classica* 44: 309-328.
- TAFFANEL, O and E (1947) "Marques d'amphores trouvées au Cayla de Mailhac" in *Gallia* 5 p 143-146.
- TARRADELL, M (1951) "Las Excavaciones de Lixus" in *Ampurias* 13: 186-190.
- TCHERNIA, A (1969) "Direction des recherches archéologiques sous-marines" in *Gallia* 27: 465-499.
- TCHERNIA, A (1971) "Les Amphores vinaires de Tarraconaise et leur exportation au debut de l'Empire" in *AEA* 44: 38-85.
- TCHERNIA, A and ZEVI, F (1972) "Amphores vinaires de Campanie et de Tarraconaise a Ostie. Recherche sur les Amphores Romaines" in *MEFRA*: 35-67.
- TCHERNIA, A (1976) "L'Atelier d'amphores de Tivissa et la marque 'Sex Domiti'." in *Melanges Heurgon*: 973-979.
- TCHERNIA, A (1979) "Il Vino: Produzione e Commercio" in Zevi, F (ed.) *Pompei* 79 (Naples): 87-96.
- TCHERNIA, A (unpub.) *Le vin italien en Gaule a la fin de la Republique* (Churchill Coll Cantab. 1980).
- TEXIER, B (1990) "Les fours à sel protohistorique du site de l'Eglise à Esnandes (Charente-Maritime)) dans leur contexte géographique et archéologique" in *Aquitania* 8: 5-24.
- THEVENOT, E (1950) "L'Importation de produits Espagnols chez les Eduens et les Lingons" in *Revue Archeologique de l'Est et du Centre-Est* 1: 65-75.
- THEVENOT, E (1952) "Una familia de negociantes en aceite establecida en la Baetica en el Siglo II" in *AEA* 25:225-231.
- THOEN, H (1981) "The Third Century Roman occupation in Belgium: the evidence of the Coastal Plain" in King, A and Henig, M (eds) *The Roman West in the Third Century. Contributions from Archaeology and History* BAR Int Ser 109: 245-257.
- THOMPSON, E A (1952) "Peasant revolts in late Roman Gaul and Spain" in *Past and Present* 2: 11-23.
- THOMPSON, E A (1969) *The Goths in Spain* (Oxford).

- THOMPSON, E A (1977) "The End of Roman Spain" in *Nottingham Medieval Studies* 21: 3-31.
- THOUVENOT, R (1940) *Essai sur la Province Romaine de Betique* (Paris).
- THROCKMORTON, P (ed) (1987) *History from the Sea: Shipwrecks and Archaeology* (London).
- TORRES, C (1951) "La Fundacion de Valencia" in *Ampurias* 13: 113-121.
- TORTORELLA, S (1986) "La ceramica fine da mensa africana dal IV al VII secolo d.C" in Giardini, A (ed.) *Società Romana e Impero Tardo-antico; Le Merci gli Insediamenti* (Bari): 211-225.
- TOYNBEE, J M C (1973) *Animals in Roman life and art* (London).
- TREMOLEDA, J (1987) "La Produccio de forn de Palamos (Baix Emporda)" in *El Vi a l'Antiguitat Economia, Produccio i Comerc al Mediterrani Occidental Actes I Colloqui d'Arqueologia Romana* (Museo de Badalona) Monografias Badalonines num 9: 210-216.
- TSIRKIN, JU B (1979) "Economy of the Phoenician settlements in Spain" in Lipinski, E (ed) *State and Temple Economy in the Ancient Near East* vol 2. *Orientalia Lovanensia Analecta* 6 (Louvain): 547-564.
- TSIRKIN, JU B (1987) "The crisis of antique society in Spain in the Third Century" in *Gerion* 5: 253-270.
- TSIRKIN, JU B (1989) "The veterans and the romanization of Spain" in *Gerion* 7: 137-147.
- TSIRKIN, JU B (1993) "Romanisation of Spain: socio-political aspect (II). Romanisation in the period of the Republic" in *Gerion* 11: 272-312.
- VAN DER WERFF, J H (1978) "Amphores de tradition punique à Uzita" in *Babesch: Bulletin Antieke Beschaving* 52-53: 171-200
- various authors (1995) "Recent work on villas around Ampurias, Girona, Iluro, and Barcelona (NE Spain)" in *JRA* 8: 271-307.
- VENY, C (1970) "Diecisiete lingotes de plomo de una nave romana de Ses Salines (Mallorca)" in *Ampurias* 31-32: 191-219.
- VENY, C (1979) "Nuevos materiales de Moro Boti" in *Trabajos de Prehistoria* 36 p 465-479.

- VILLARONGA, L (1973) "Presencia Rodia en Rosas (Gerona) a finales del Siglo III a.d. J C" in *Ampurias* 35: 247-248.
- VIVES, J (1971) *Inscripciones Latinas de la Espana Romana* (Barcelona).
- WACHER, J (1987) *The Roman Empire* (London).
- WAGNER, C G (1983) "Aproximación al proceso histórico de Tartessos" in *AEA* 56: 3-35.
- WAGNER, C G (1987a) "Fenicios y Cartagineses en la Peninsula Iberica. A proposito de una publicacion reciente" in *Gerion* 5: 317-344.
- WAGNER, C G (1987b) "Arqueologia del Pais Valenciano: panorama y perspectivas" in *Gerion* 8: 345-357.
- WAGNER, J (1978) "El Yacimiento Submarino de Torre la Sal, Cabanes (Castellon)" in *CPAC* 5: 305-331.
- WALLACE, S L (1938) *Taxation in Egypt from Augustus to Diocletian* (Princeton).
- WAY, R (1962) *A Geography of Spain and Portugal* (London).
- WEST, L C (1917) "Phases of commercial life in Roman Egypt" in *JRS* 7: 45-58.
- WEST, L C (1929) *Imperial Roman Spain: The Objects of Trade* (Oxford).
- WHEELER, A and LOCKER, A (1985) "The estimation of size in Sardines (*Sardina pilchardus*) from Amphorae in a Wreck at Randello, Sicily" in *Journal of Archaeological Science* 12: 97-100.
- WILKINS, J M and HILL, S (1994) *Archestratus. The Life of Luxury* (Totnes).
- WILL, E L (1979) "The Sestius Amphoras: a reappraisal" in *JFA* 6: 339-350.
- WILL, E L (1986) "Amphoras and trade in Roman Sardinia" in Balmuth, M S (ed) *Studies in Sardinian Archaeology, vol ii: Sardinia in the Mediterranean* (Ann Arbor): 211-228.
- WILLIAMS, D F and CARRERAS, C (1995) "North African amphorae in Roman Britain: a reappraisal" in *Britannia* 26: 231-252.
- WISEMAN, F J (1956) *Roman Spain* (London).
- WOODIWISS, S (ed) (1992) *Iron Age and Roman Salt Production and the Medieval town of Droitwich* CBA Research Report 81 (London).
- WOODS, D, COLLANTES DE TERÁN Y DELORME, F and FERNÁNDEZ CHICARRO, C (1967) *Carteia* EAE 58 (Madrid).

- WOOLF, G (1990) "World-systems analysis and the Roman Empire" in *JRA* 3: 44-58.
- WOOLF, G (1992) "Imperialism, empire and the integration of the Roman Economy" in *World Archaeology* 23.3: 283-293.
- ZAHN, R (1912) "Garum" in *RE* coll. 70-96.
- ZEVI, F (1966) "Appunti sulle anfore Romane: I La tavola tipologica del Dressel" in *Archaeologia Classica* 18: 208-247.
- ZEVI, F and TCHERNIA, A (1969) "Les Amphores de Byzacene au Bas-Empire" in *Antiquités Africaines* 3: 173-214.
- ZUCCA, R (1985) "Rinvenimenti Archeologici Sottomarini presso il ΚΟΡΑΚΩΔΗΣ ΛΙΜΗΝ (Sardegna)" in *VI CIAS*, Cartagena 1982 (Cartagena): 149-151.

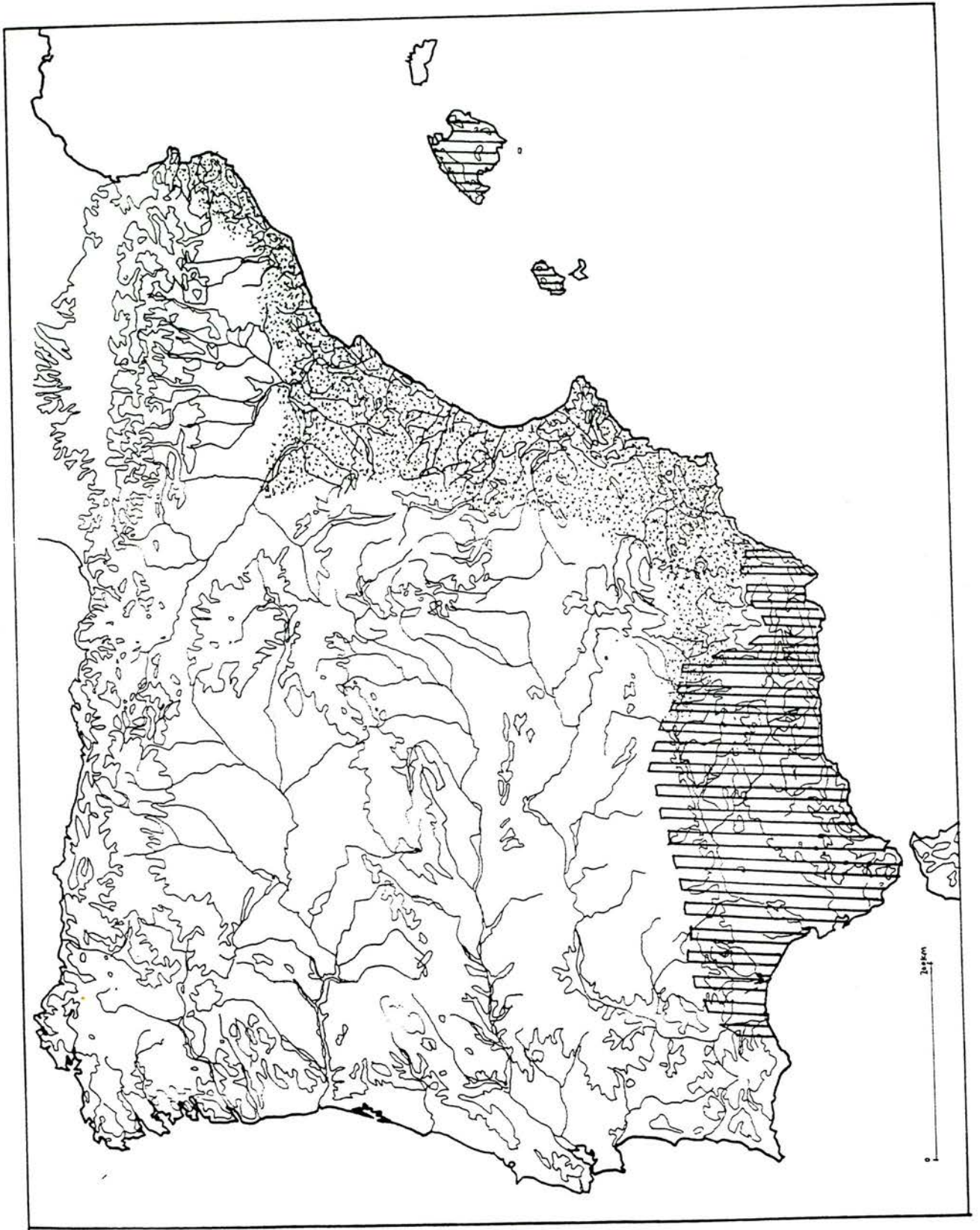


Fig. 1: Areas of Greek and Phoenician Influence in the Iberian Peninsula

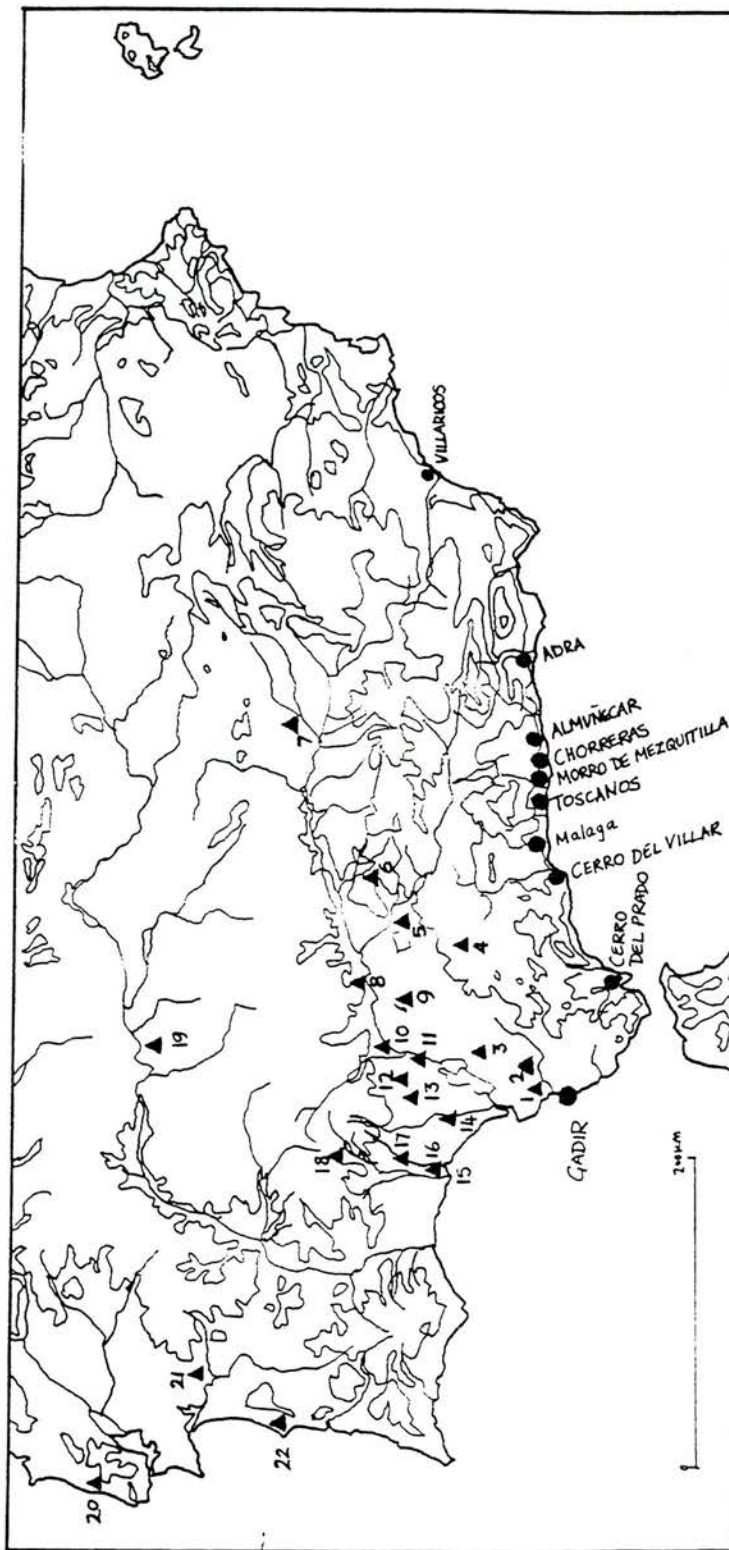


Fig. 2: Gadir and the Iberian Communities of the Guadalquivir Valley

- 1 Doña Blanca 2 Mesas de Asta 3 Lebrija 4 Osuna 5 Ecija 6 Ategua 7 Cástulo 8 Setefilla 9 Carmona 10 Cerro Macareno 11 Carambolo 12 Aznalcollar 13 Tejada 14 S. Bartolomé 15 Huelva 16 Niebla 18 Río Tinto 19 Medellín 20 Torres Vedras 21 Alcacer-do-Sal 22 Sines

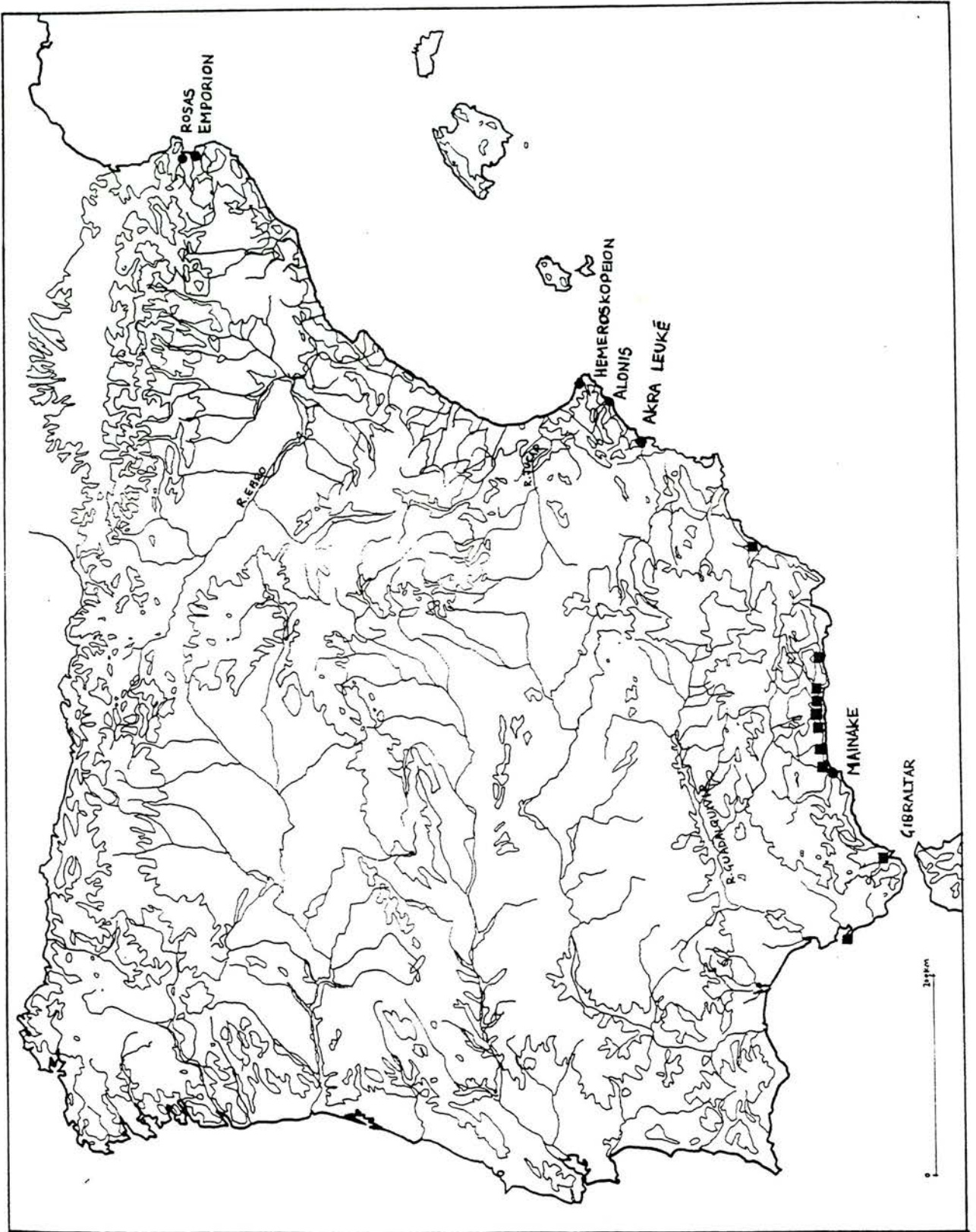


Fig. 3: Greek Colonization

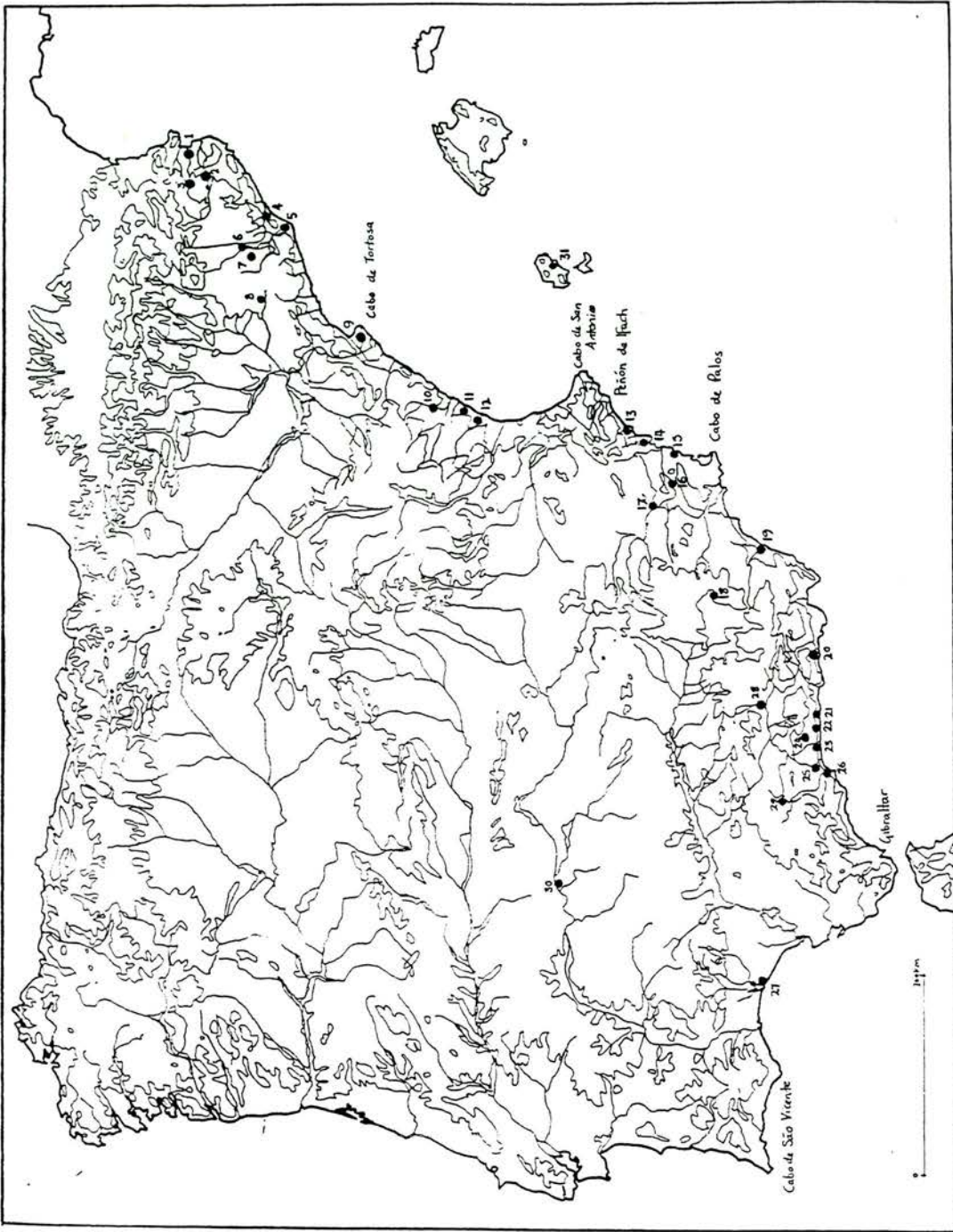
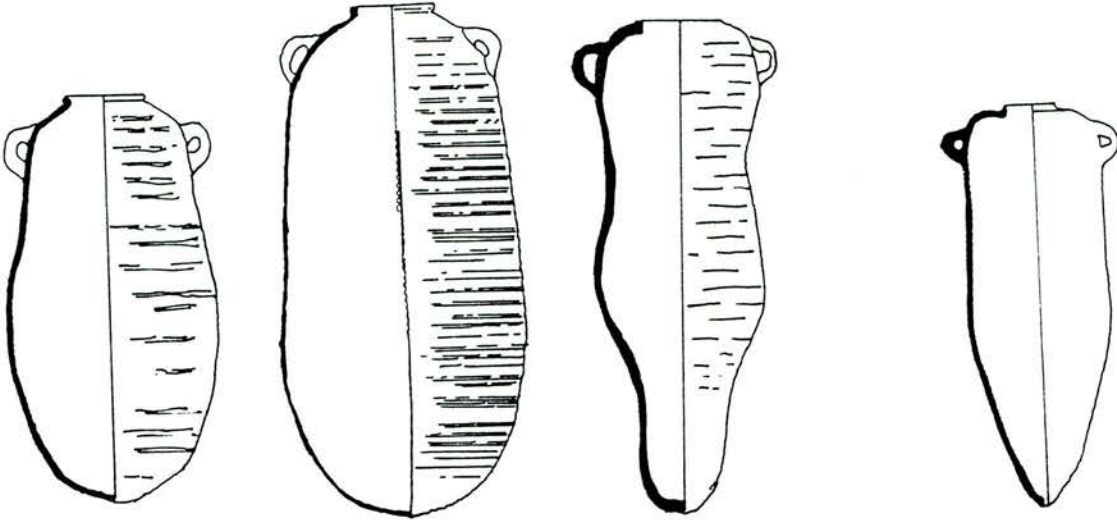


Fig. 4: Distribution of Sixth Century BC Imported Greek Pottery (after Rouillard, P (1991) map 3)

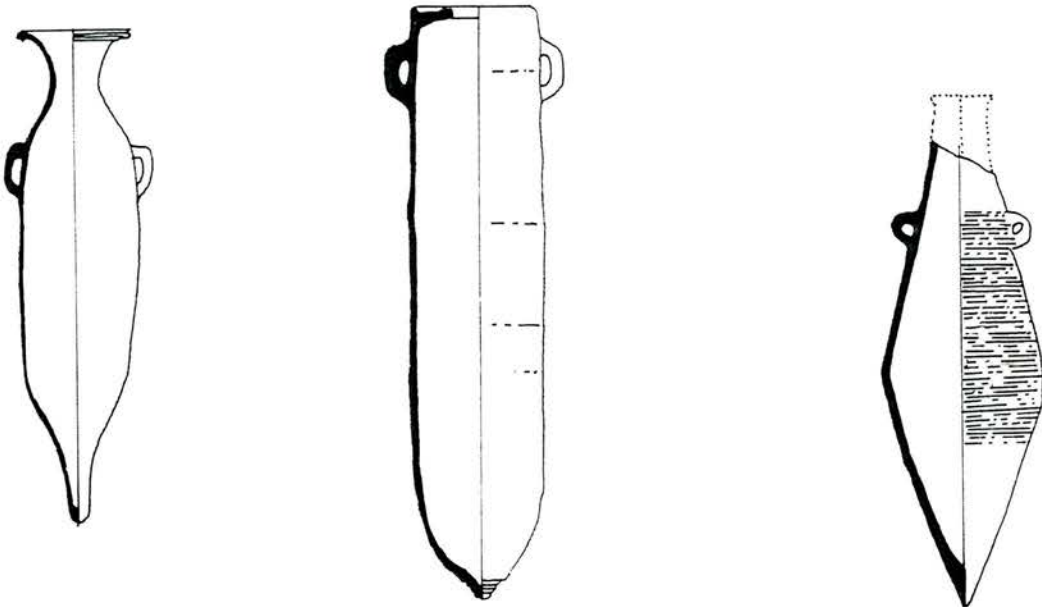
1. Empúries 2. Puig de Sant Andreu (Ullastret) 3. Illa d'en Reixac (Ullastret) 4. Castell de Burriach 5. Penya del Moro 6. Boades 7. Puig Cardener 8. Ciutadilla 9. La Palma 10. Tossalet de les Forques 11. Punta de Orley 12. Sagunto 13. Fossal de Manises 14. El Molar 15. Cabezo Lucero 16. Los Saladares 17. Cabezo del Tío Pío 18. Cerro del Real 19. Villaricos 20. Cerro de Montecristo (Abdera) 21. Almuñecar 22. Morro de Mezquitilla 23. Toscanos 24. Cerro del Mar 25. Málaga 26. El Villar 27. Huelva 28. Cerro de los Infantes 29. Los Castellones de Gobantes (Peñarrubia) 30. Medellín 31. Puig des Molins



1 Mañá A (after Ramon, J (1987) fig. 2.4-5)

2 Mañá B from La Bastida de les Alcuses (after Llobregat, E A (1974) fig. 2.6)

3 Mañá B from Cabrera del Mar (from Miró, J (1983) fig. 2.7)

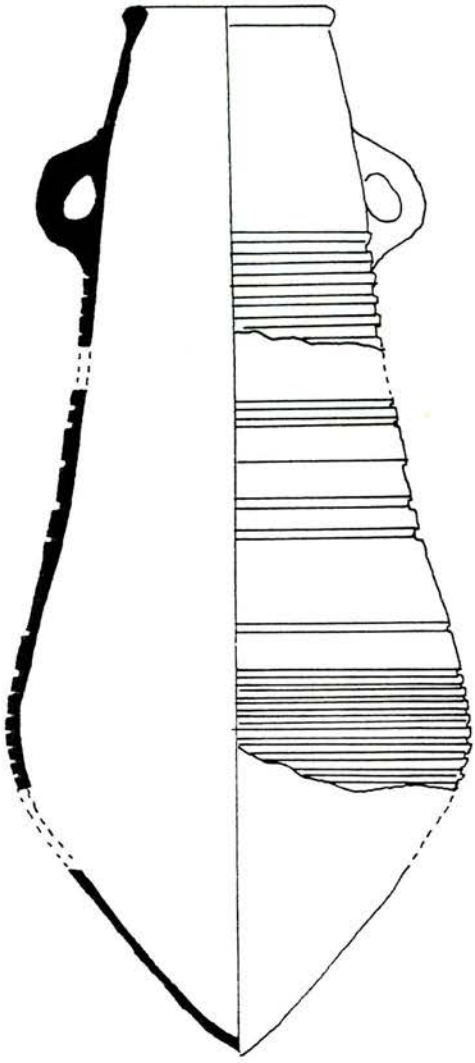


4 Mañá C 2 (after Muñoz Vicente, A et alii (1987) fig. 9.4)

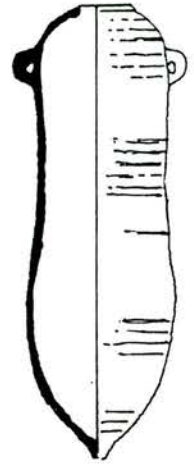
5 Mañá D 1a (after Muñoz Vicente, A et alii (1987) fig. 6.2)

6 Mañá E from Tossal de Manises (from Llobregat, E A (1974) fig. 5)

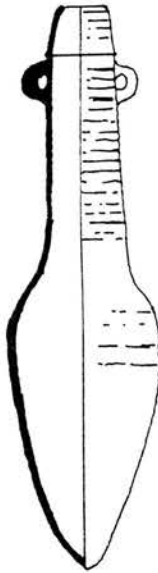
Fig. 5: Mañá A, B, C 2, D 1a and E amphorae



1 PE 15 from Darró  
(after Lopez Mullor and  
Fiero Macia (1990) fig. 4)



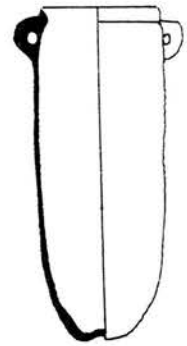
2 Mañá-Pascual A4a forms (after Muñoz Vicente,  
A et alii (1987) fig. 9.1-3)



3 Mañá-Pascual A 4f  
(after Muñoz Vicente, A  
et alii (1987) fig. 10.4)



4 E 1 (after  
Muñoz Vicente, A et  
alii (1987) fig. 9.1)



5 E 2 (after  
Muñoz Vicente, A  
(1987) fig. 9.2)

Fig. 6: PE 15, Mañá-Pascual A 4a, Mañá-Pascual A 4 f, E 1 and E 2 amphorae

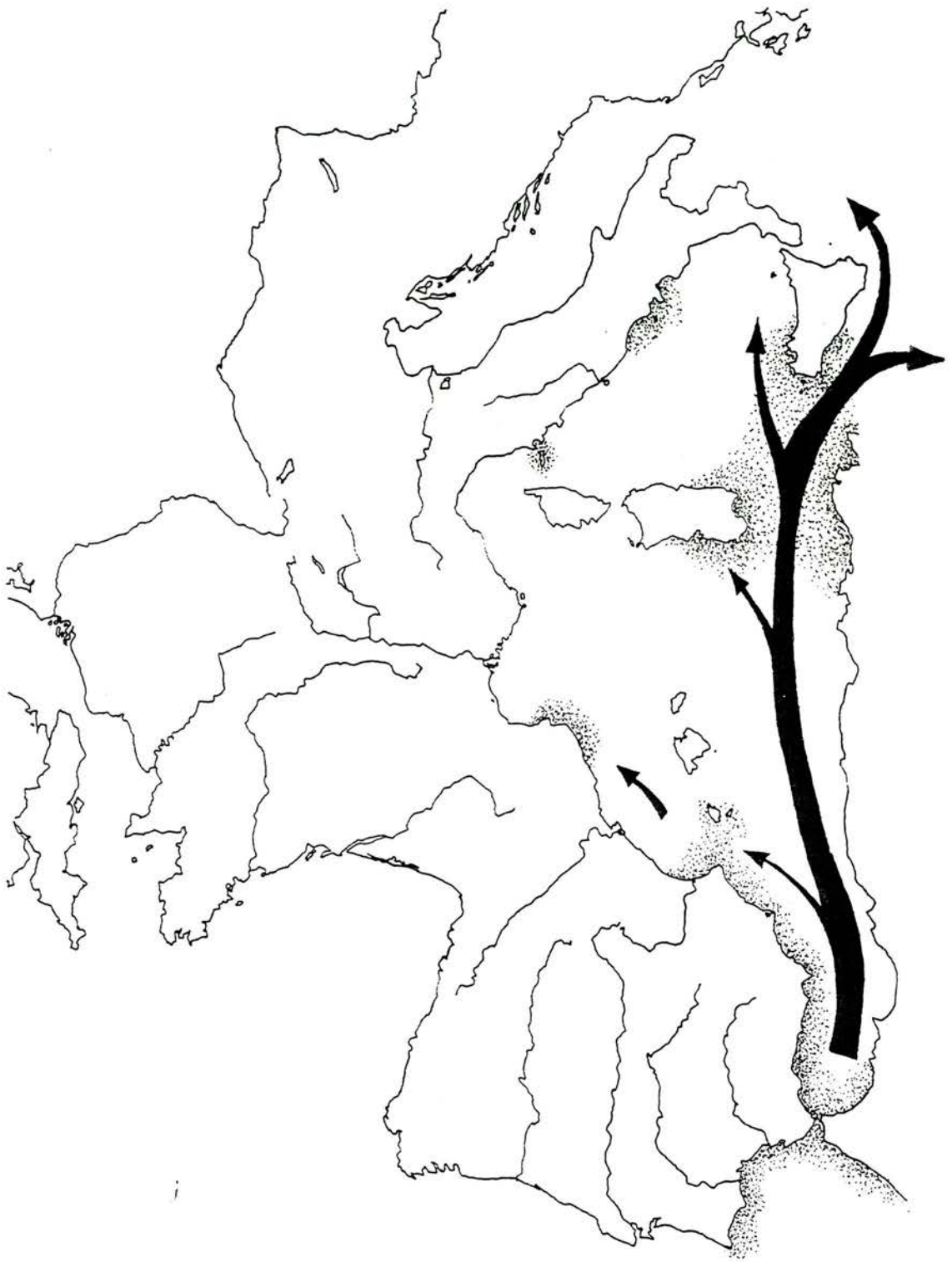


Fig. 7: The Route of the Tunny migrations through the Western Mediterranean

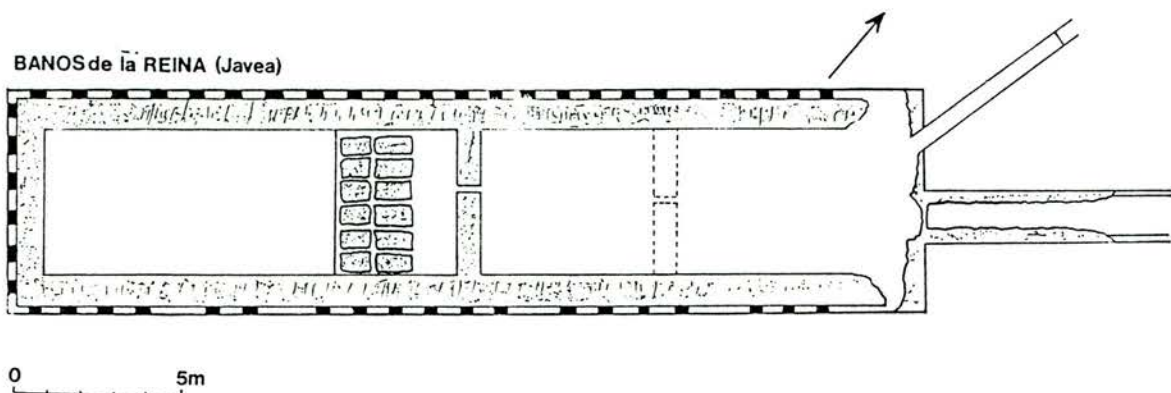


Fig. 8: Plan of the Baños de la Reina. Punta de l'Arenal, Javea (after Martin, G and Serres, Ma D (1970) fig. 3)

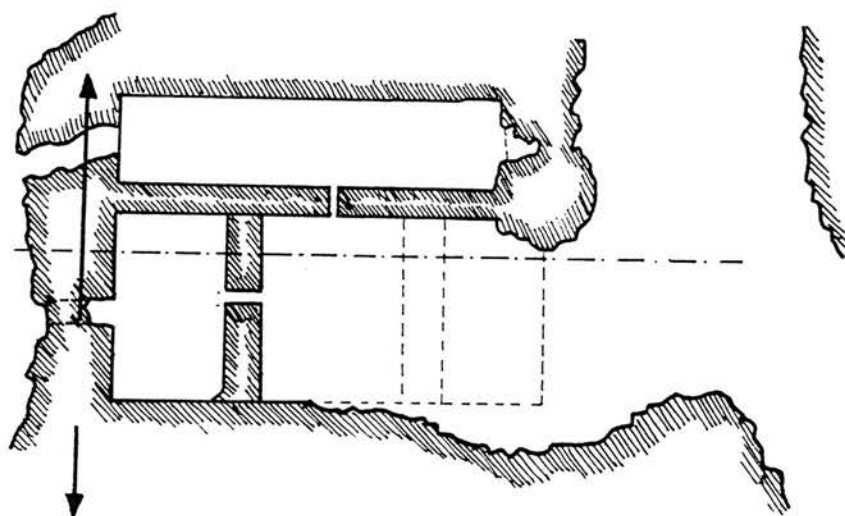
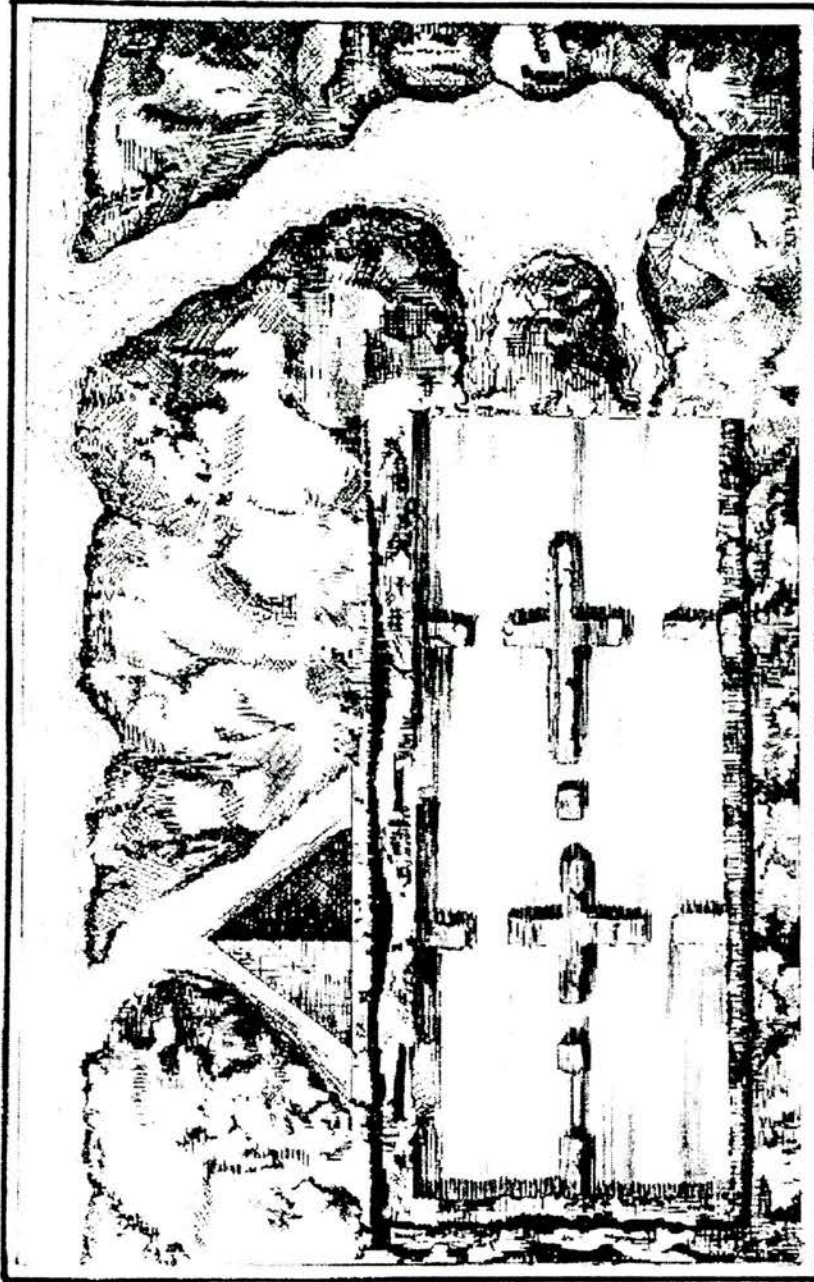


Fig. 9: Plan of the Baños at El Campello (after Martin, G and Serres, Ma D (1970) fig. 4)



ALCANTARILLAS. Torno II. Baños. 217.

12 metros cuadrados

Fig. 10: Cavanilles' plan of the Baños at Calpe

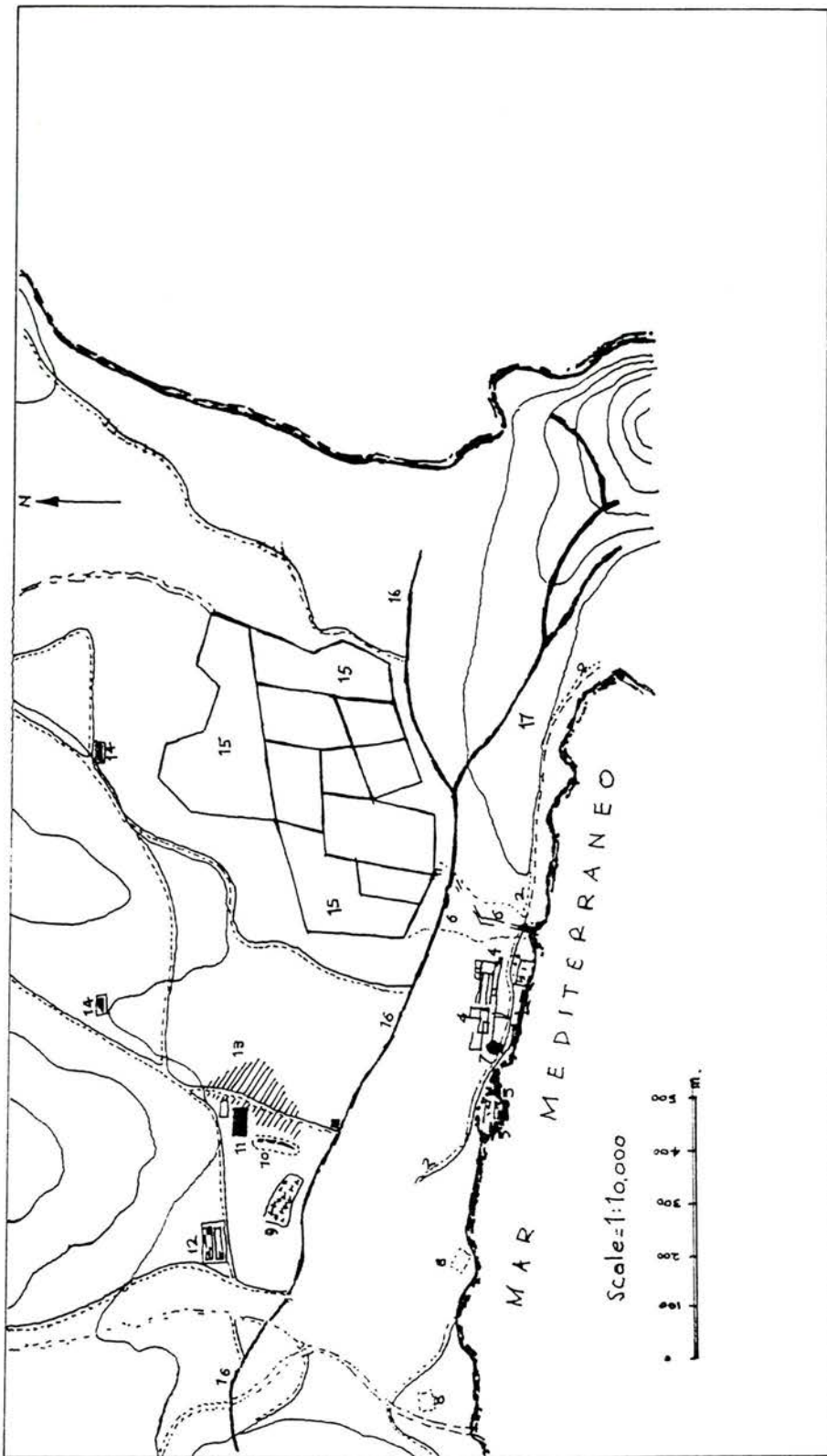


Fig. 11: Calpe and the environs of the Baños de la Reina (after Reynolds, P (1993) fig. 84)

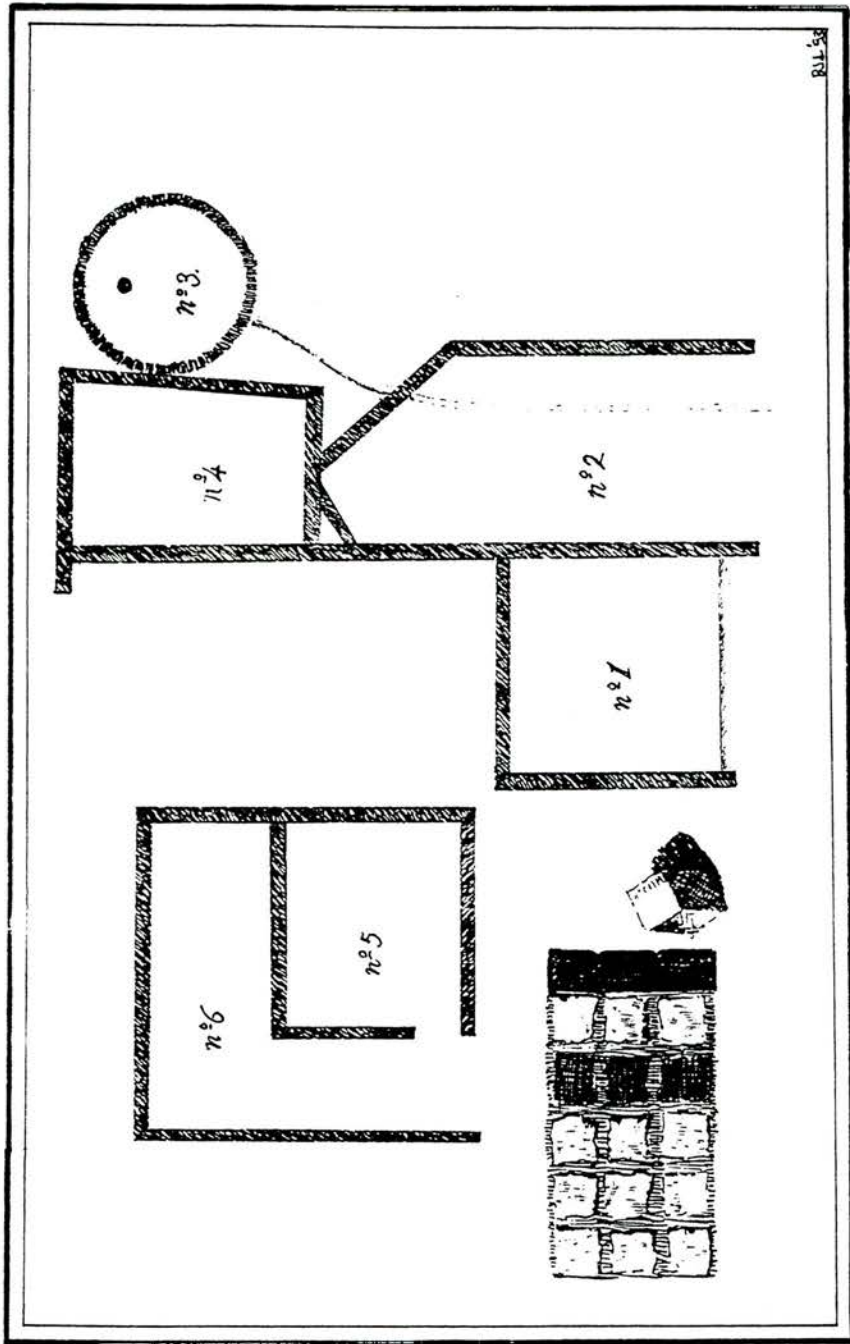


Fig. 12: Cavanilles' plan of the villa at Calpe

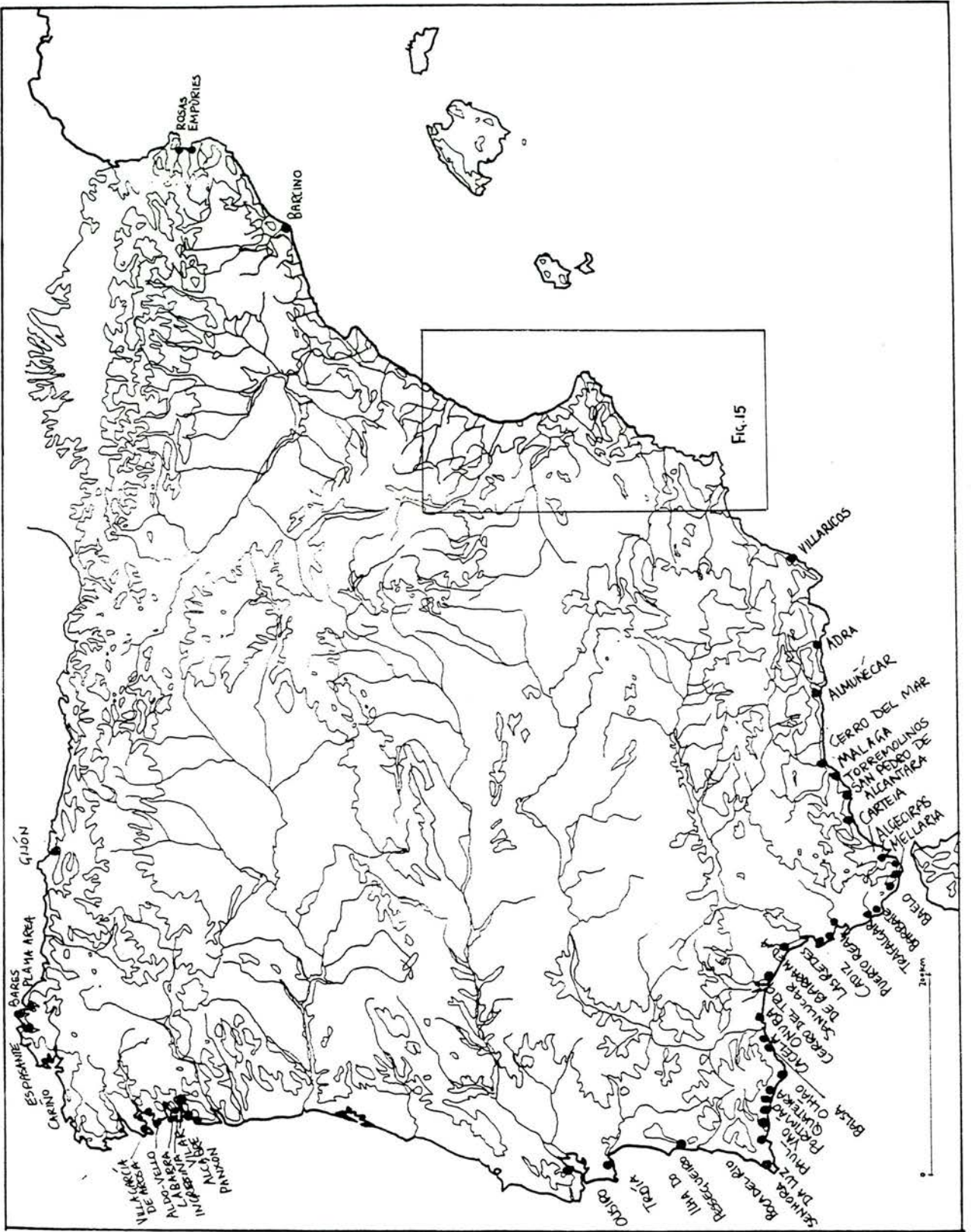


Fig. 13: The Fisheries of the Iberian Peninsula

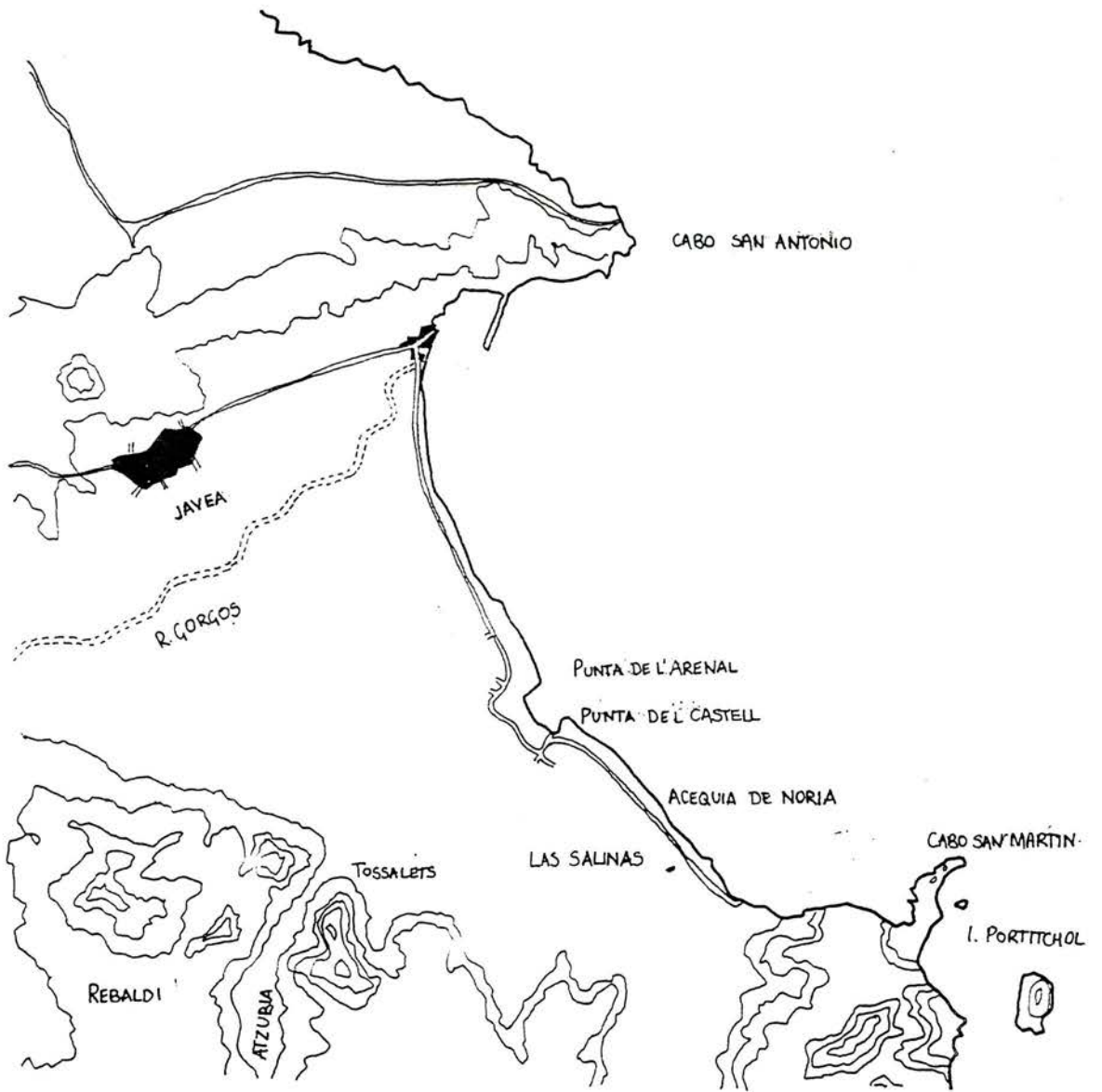


Fig. 14: The fisheries of Javea (after Martin, G and Serres, Ma D (1970) fig. 1)

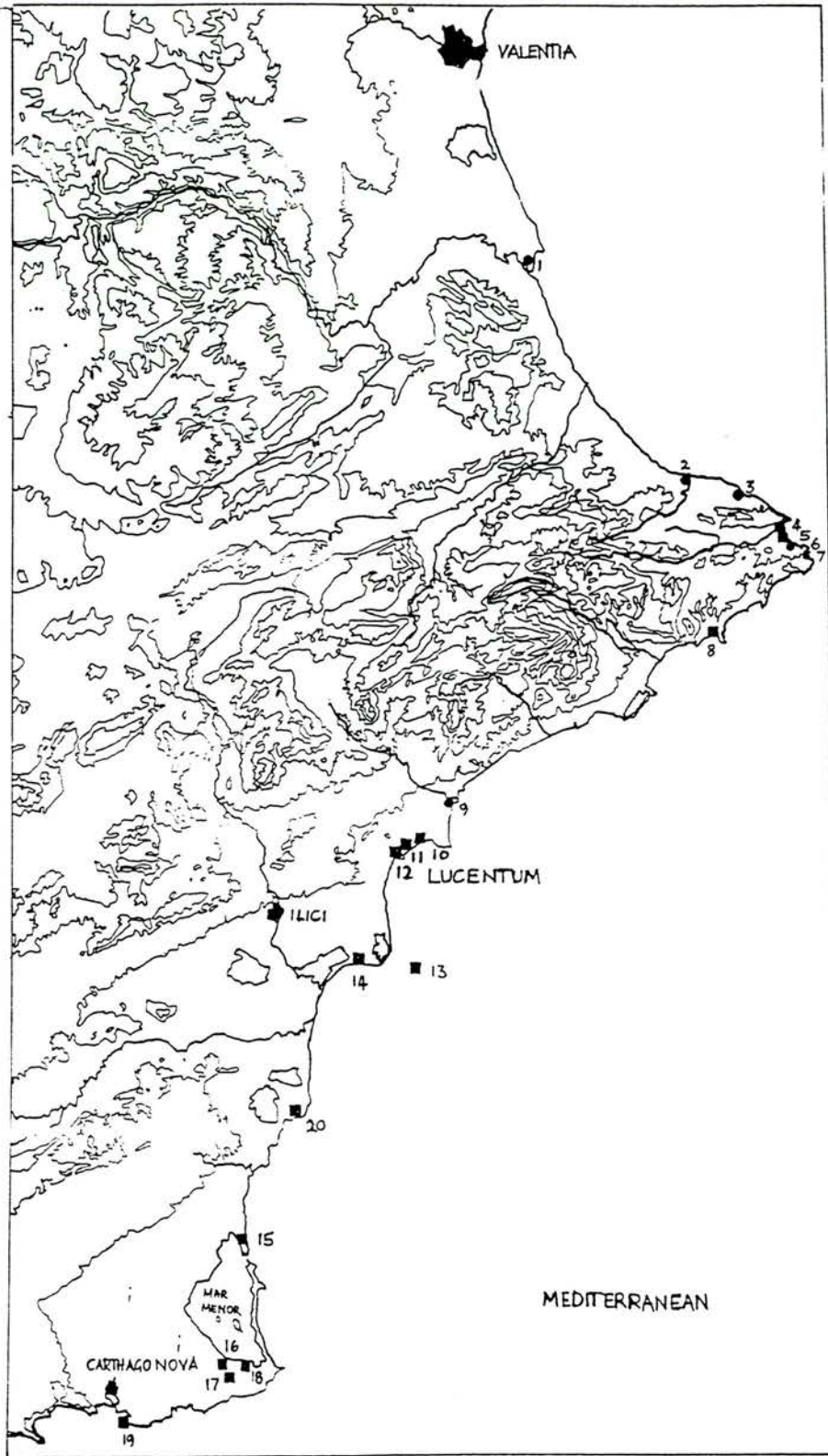


Fig. 15: Fisheries and related sites within Alicante and Valencia

1 Cullera 2 Mirafior 3 Dianium 4 Punta de l'Arenal 5 Punta del Castell 6 Acequia de Noria 7 Isla de Portitchol 8 Calpe 9 Campello 10 Tossal de Manises 11 Albufereta 12 Benalúa 13 Isla de Tabarca 14 Santa Pola 15 San Pedro del Pinatar 16 Las Mateas 17 San Ginés 18 Castillicos 19 Escombreras 20 Torrevieja

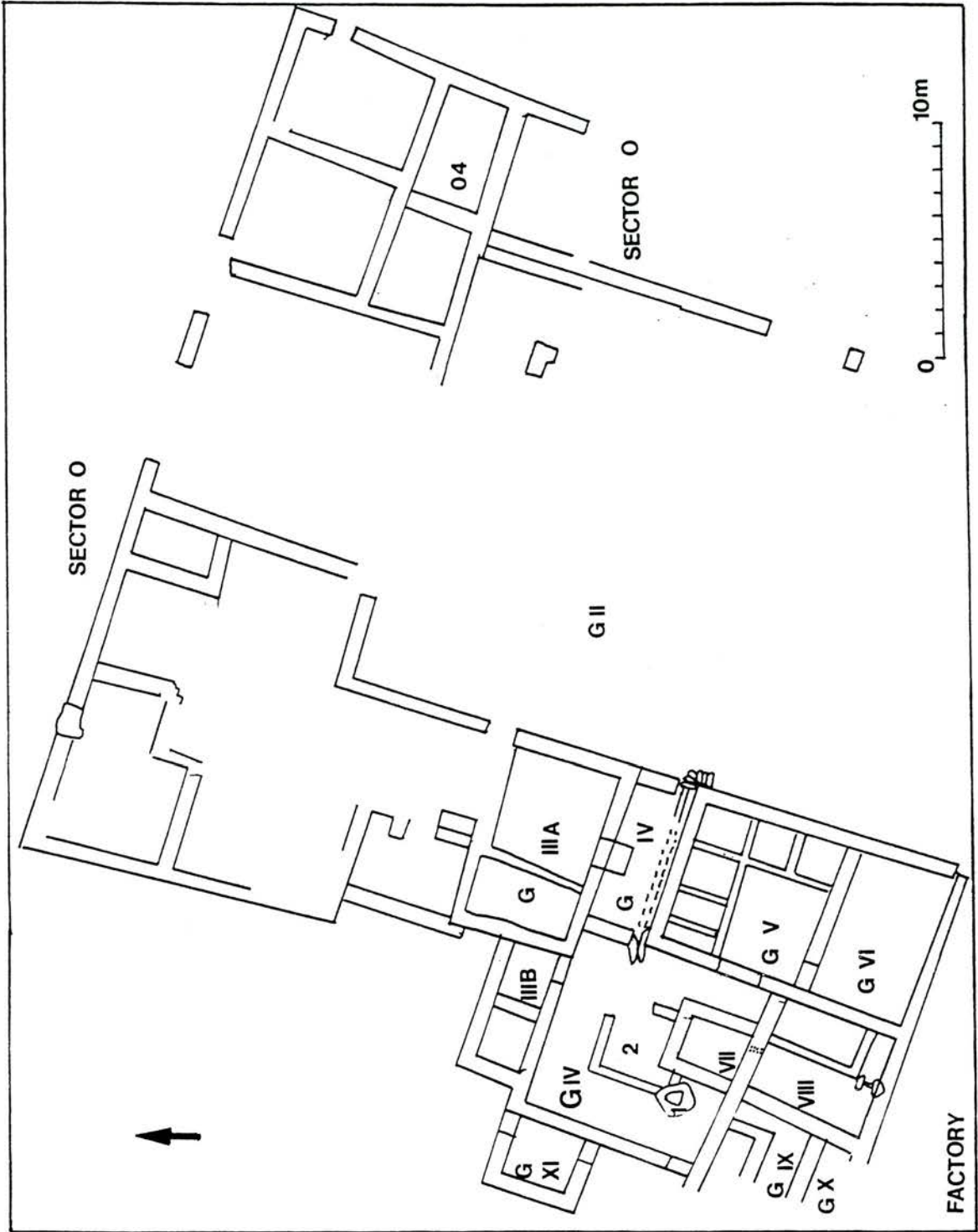


Fig. 16: Area G, Rosas (after Nolla, J Ma (1984))

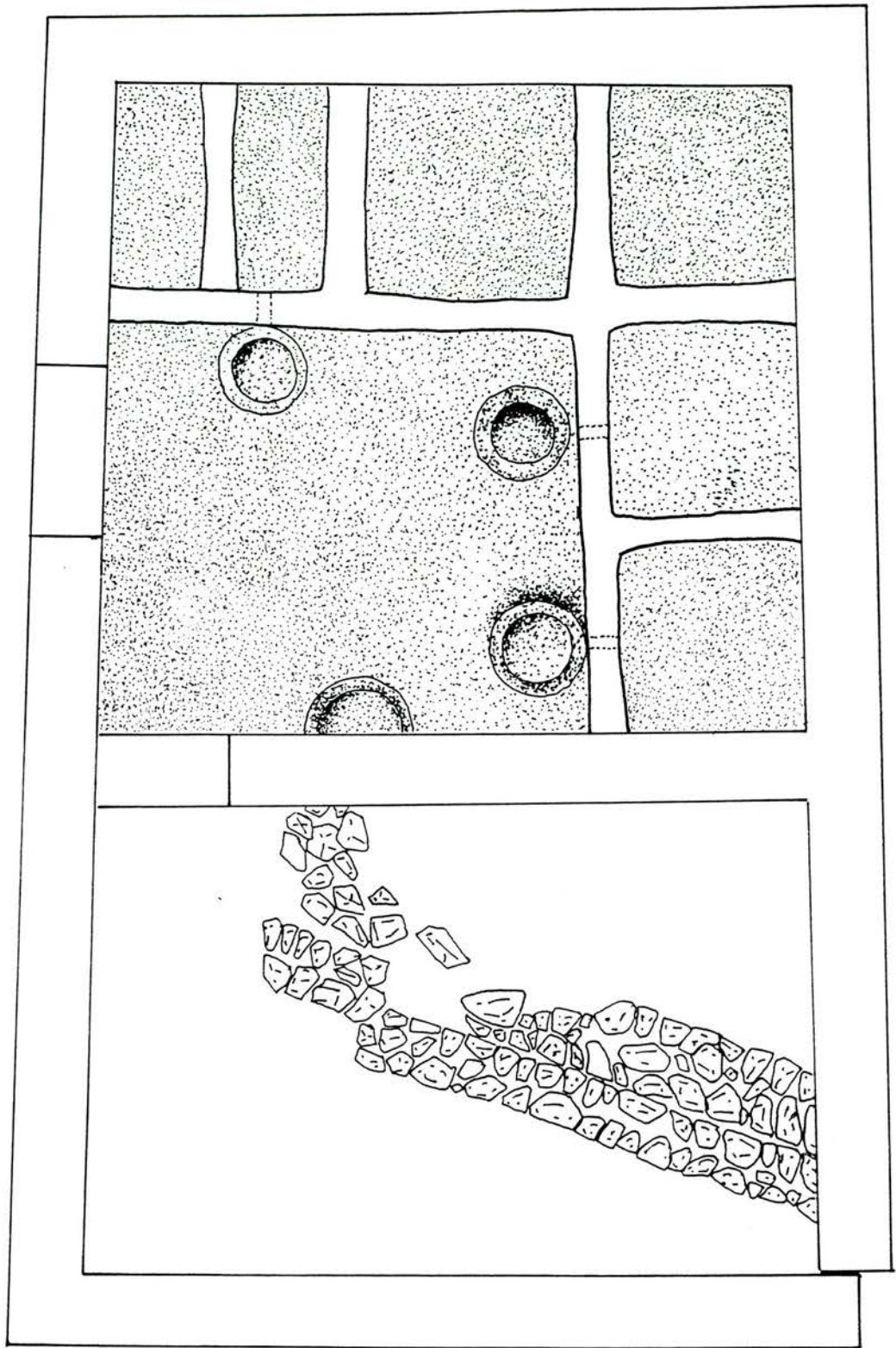


Fig. 17: The Salting area of the fishery at Rosas (after Nolla. J Ma (1984) p. 153)

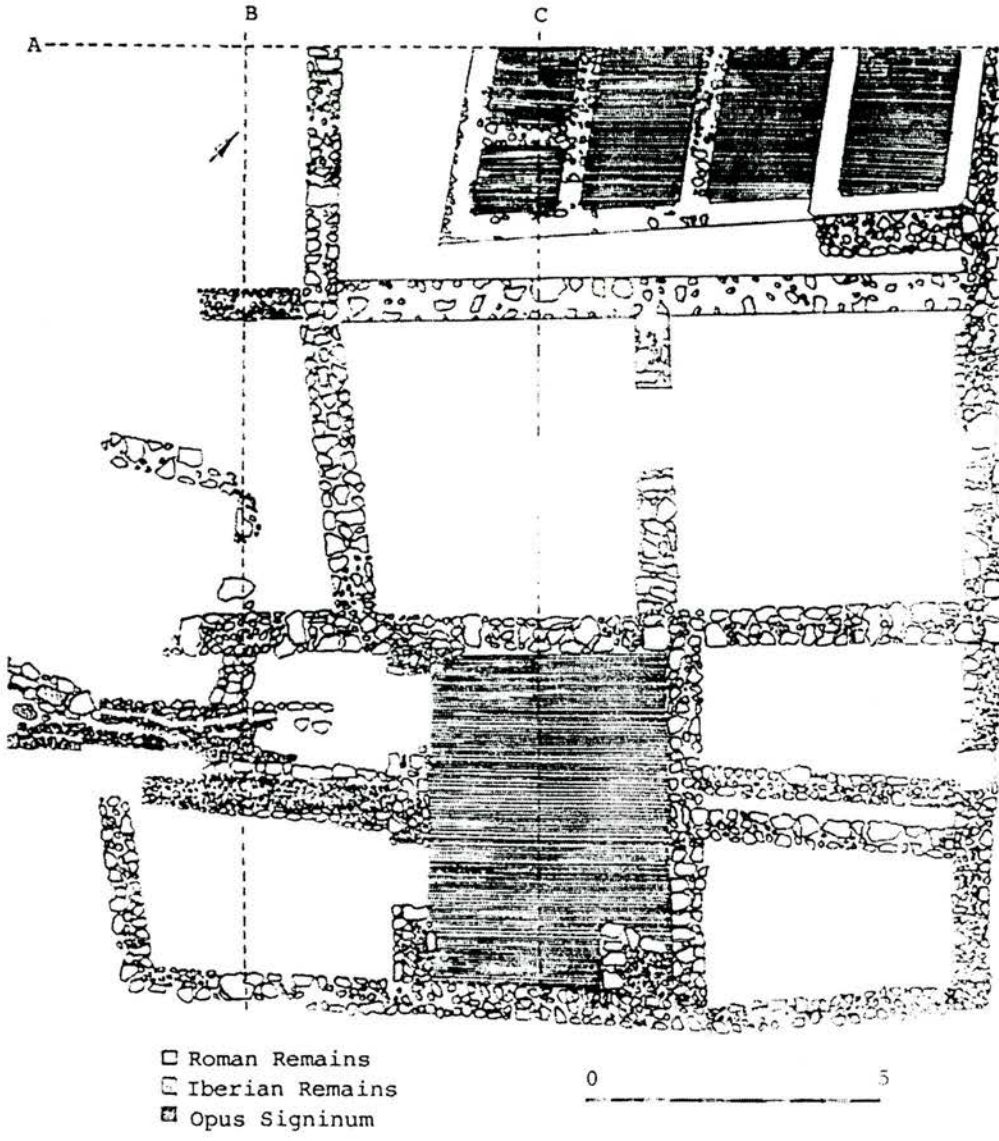


Fig. 18: The fishery at Santa Pola (after Sanchez Fernandez, M J et alii (1989) fig. 1)

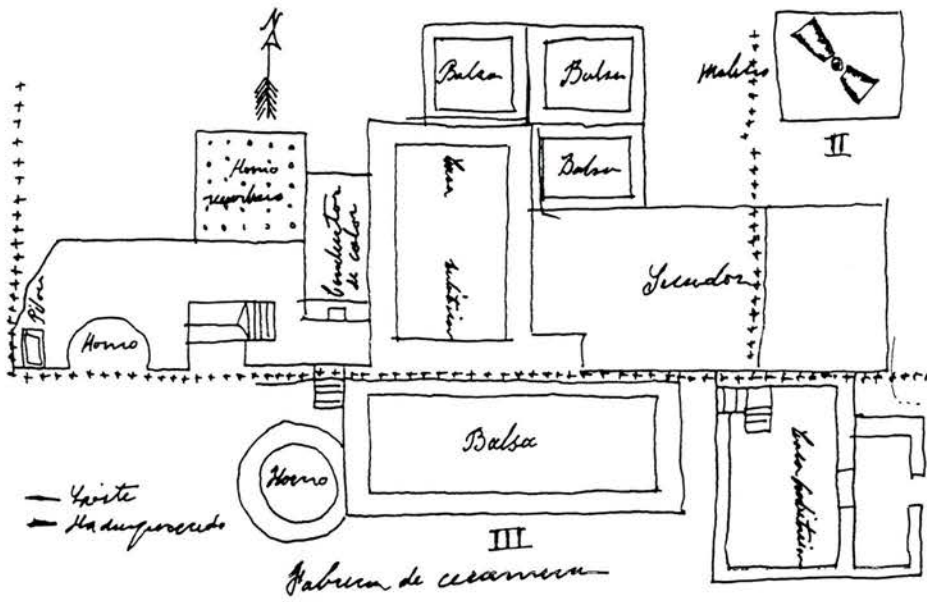


Fig. 19: Garcia's plan of the fishery at Benalúa (after Reynolds, P (1993) fig. 49)

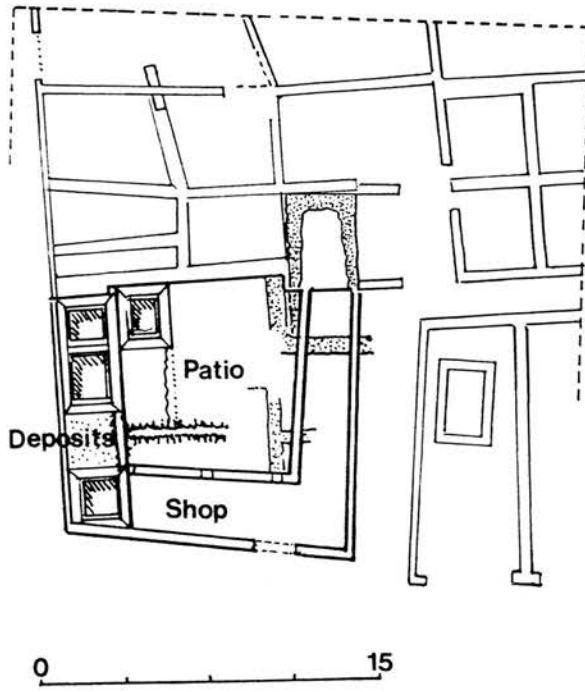
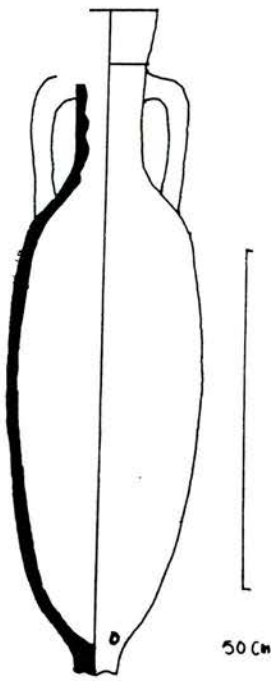
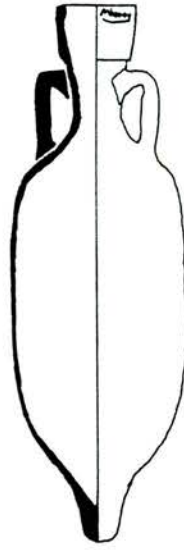


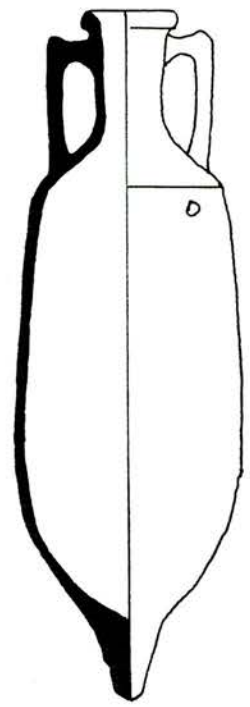
Fig. 20: Plan of the fishery at Empuries



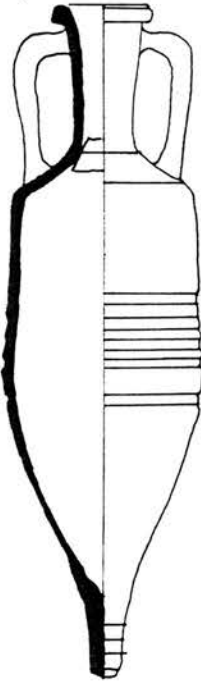
1 Pascual 1 amphora from Badalona (after Miró, J (1988) fig. 9.1)



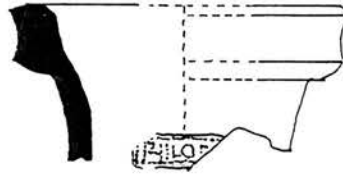
2 Pascual 1 from Lyon (after Desbat, A (1987) fig. 1.6)



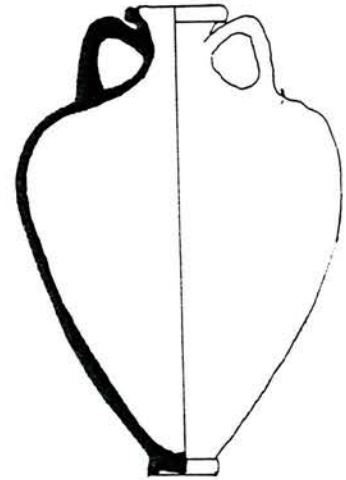
3 Dr 2-4 from Badalona (from Miró, J (1988) fig. 15.5)



4 Dr 2-4 from L' Almadrava (after Gisbert, J (1987) fig. 2.1)



5 Oberaden 74 from El Sot del Camp (after Miró, J (1988) fig. 26.1)



6 Dr 30/Pelichet 47 from Colchester (after Peacock, D P S and Williams, D F (1986) fig. 70)

Fig. 21: Pascual 1, Dr 2-4, Oberaden 74 and Dr 30/Pelichet 47 amphorae

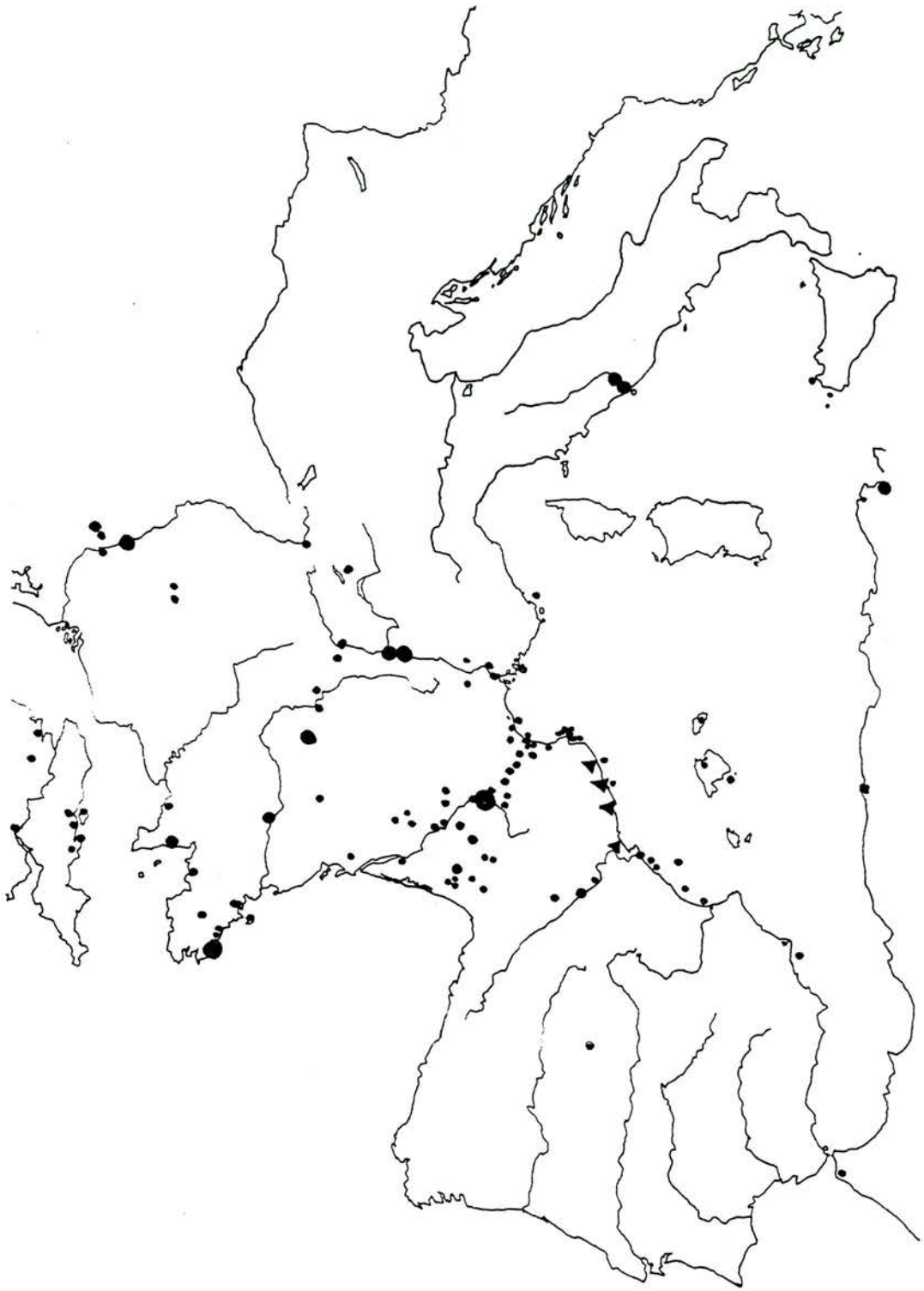


Fig. 22: Distribution of Pascual 1 amphorae

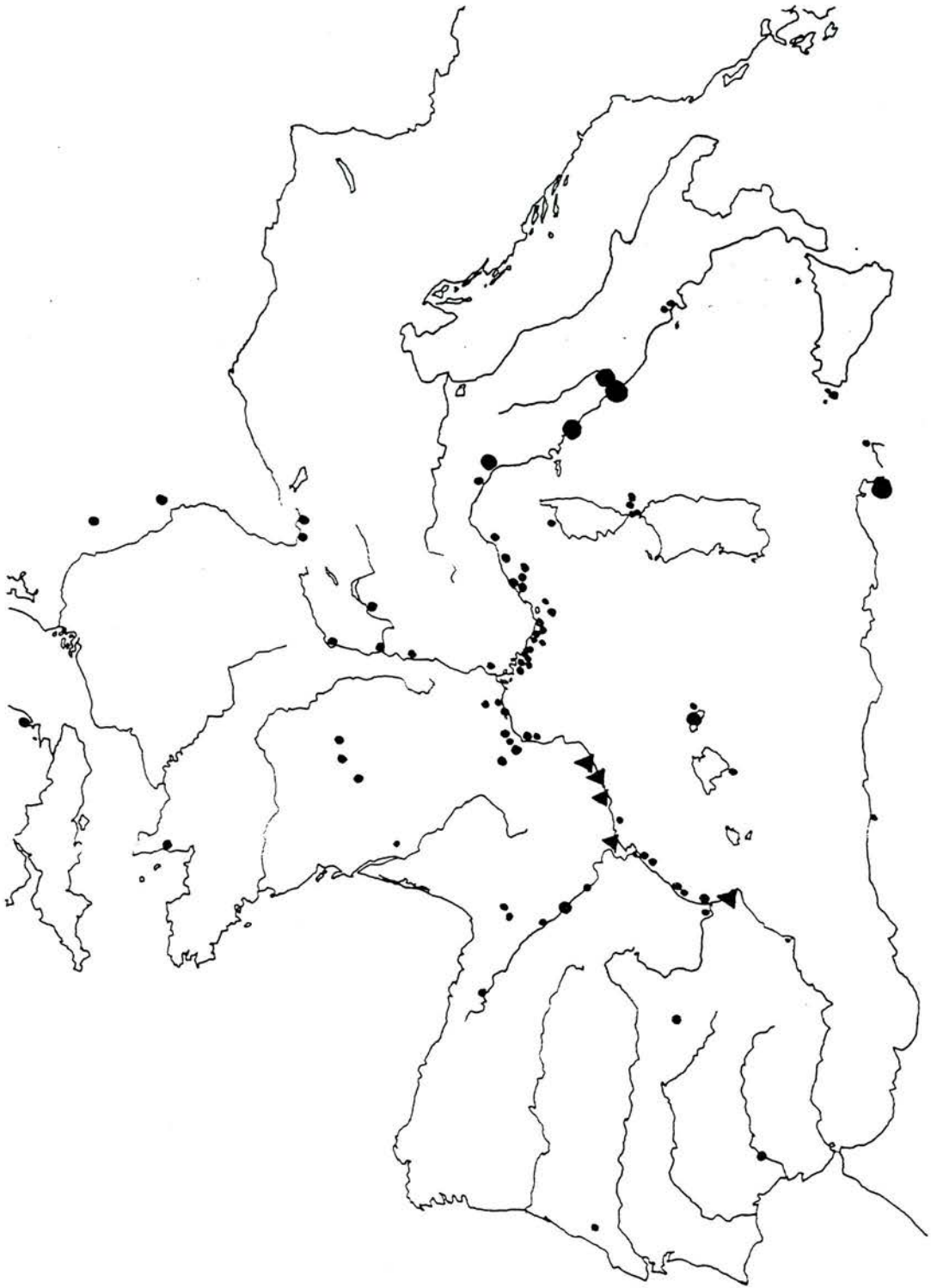


Fig. 23: Distribution of Dr 2-4 amphorae

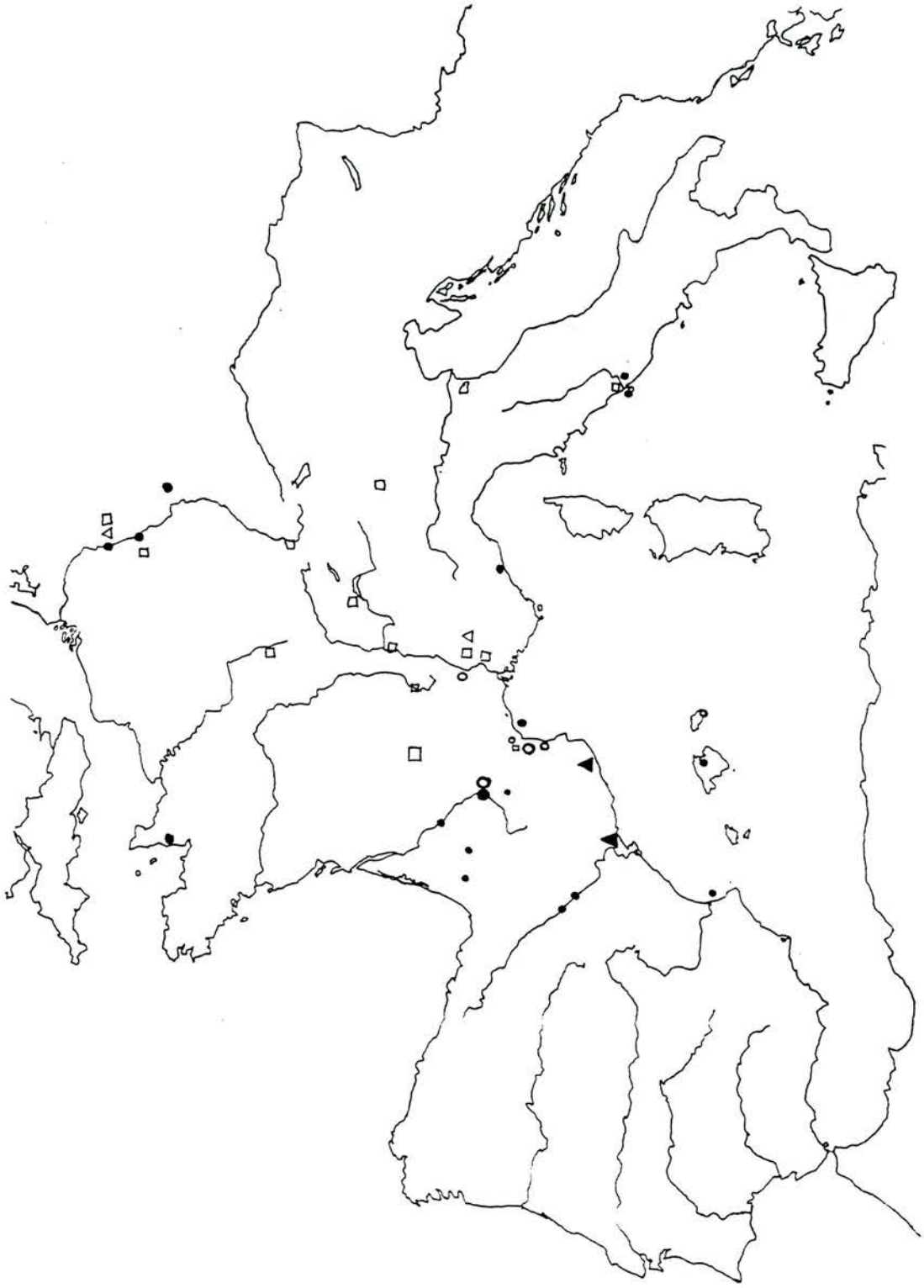
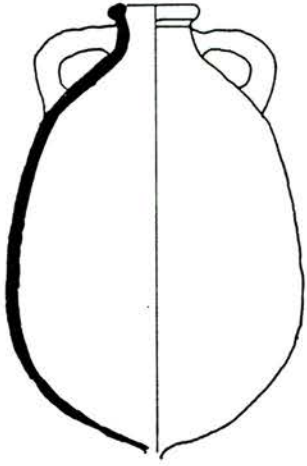


Fig. 24: Distribution of Oberaden 74 amphorae

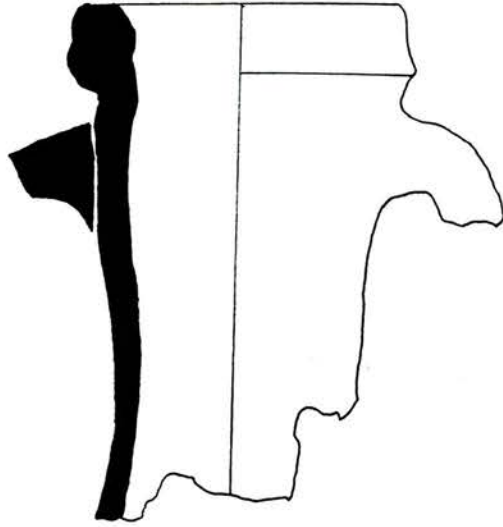
○ Philodamus

□ Sextus Domitius

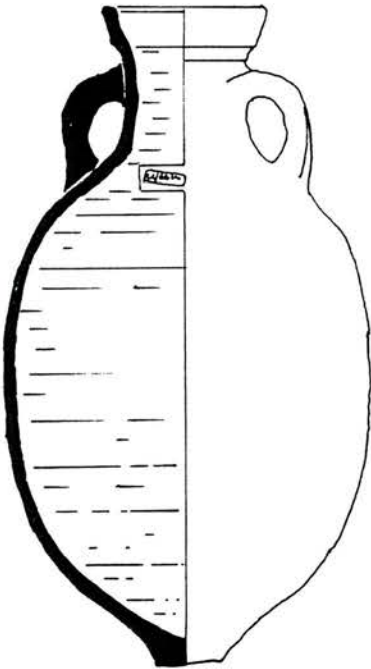
△ C. Mussidius Nepos



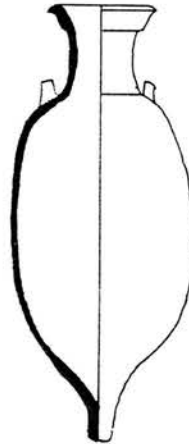
1 Dr 26 from L' Almadrava  
(after Gisbert, J (1987) fig. 2.2)



2 Dr 1 Layetana from Burriac  
(after Miró, J (1988) fig. 1.1)

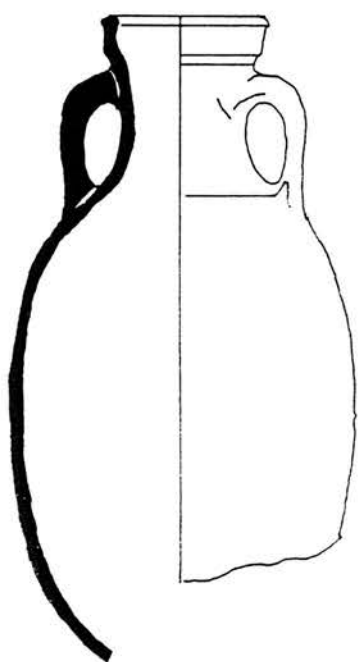


3 Tarraconense 1 from Empúries  
(after Nolla, J Ma (1987) fig. 1.1)

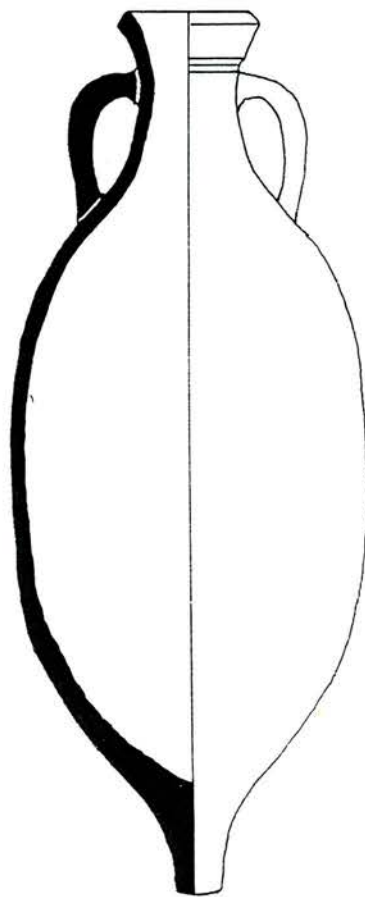


4 Dr 7-11 from Ben-Afeli  
(after Fernandez Izquierdo, A  
(1985) fig. 4.1)

Fig. 25: Dr 26, Dr 1 Layetana, Tarraconense 1 and Dr 7-11 amphorae

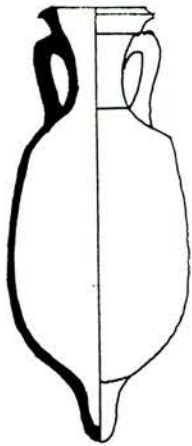


1 Tarraconense 1 from Empùries  
(after Nolla, J Ma (1987) fig. 1.3)



2 Amphora from the wreck site of  
Illes Formigues (Palamós) (after  
Nolla, J Ma (1987) fig. 1.4)

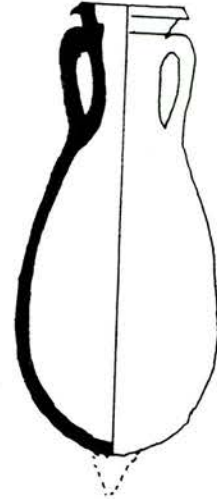
Fig. 26: Amphorae from Palamós



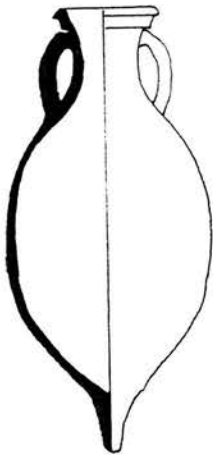
1 Dr 7 from Granada (after  
González Serrano, Ma P (1988)  
fig. 7a)



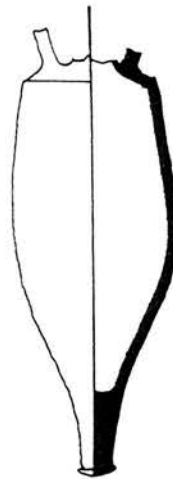
2 Dr 8 from Cádiz (after  
González Serrano, Ma P (1988)  
fig. 10a)



3 Dr 9 from Albacete  
(after González  
Serrano, Ma P (1988)  
fig. 11a)

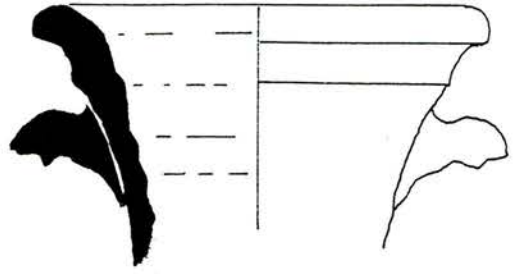
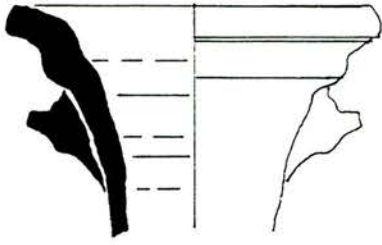


4 Dr 10 from Barcelona (after  
González Serrano, Ma P (1988)  
fig. 7c)

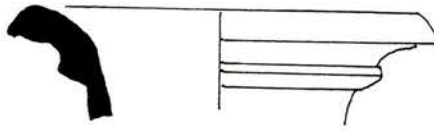
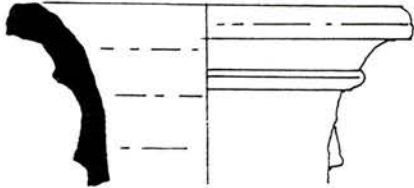


5 Dr 11 from Cádiz (after  
González Serrano, Ma P (1988)  
fig. 10b)

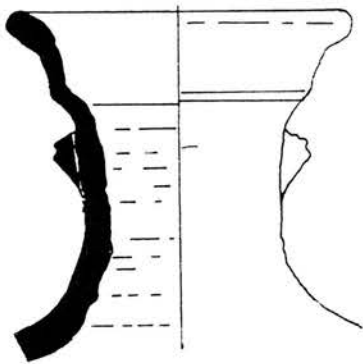
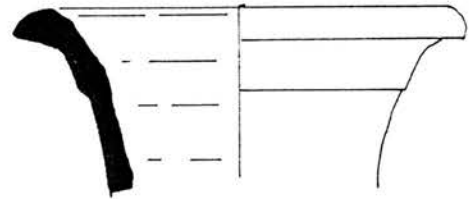
Fig. 27: Dr 7, Dr 8, Dr 9, Dr 10 and Dr 11 amphorae



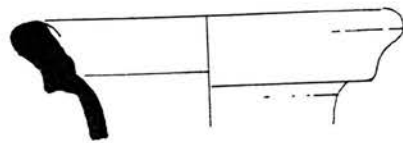
Variant 1 (after Revilla Calvo, V (1993) fig. 15. 1-2)



Variant 2 (after Revilla Calvo, V (1993) fig. 16.10, 17.2)



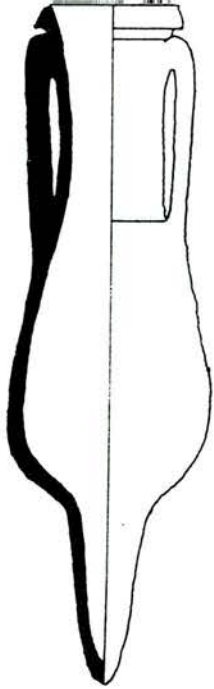
Variant 3 (after Revilla Calvo, V (1993) fig. 17.7)



Variant 4 (after Revilla Calvo, V (1993) fig. 18.6)

Variant 5 (after Revilla Calvo, V (1993) fig. 18.16)

Fig. 28: Dr 7-11 variants from Tivissa



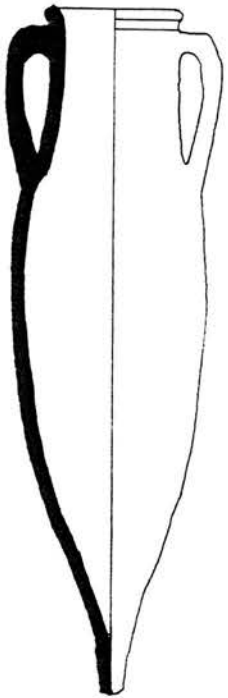
1 Dr 38 (after Peacock, D P S and Williams, D F (1986) fig. 54)



2 Beltran II B (after Peacock, D P S and Williams, D F (1986) fig. 55)



3 Dr 12 (after González Serrano, Ma P (1988) fig. 4a) from Zaragoza



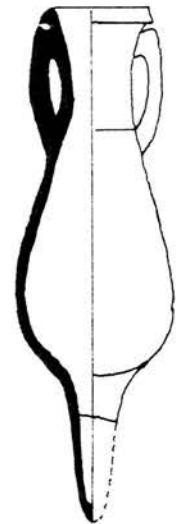
4 Dr 21-22 (after Peacock, D P S and Williams, D F (1986) fig. 32)



5 Dr 13 from Zaragoza (after González Serrano, Ma P (1988) fig. 4b)



6 Dr 14 from Seville (after González Serrano, Ma P (1988) fig. 11f)



7 Dr 15 from Cala Culip (after González Serrano, Ma P (1988) fig. 11c)

Fig. 29: Dr 38. Beltrán IIB. Dr 12. Dr 21-22. Dr 13. Dr 14 and Dr 15 amphorae

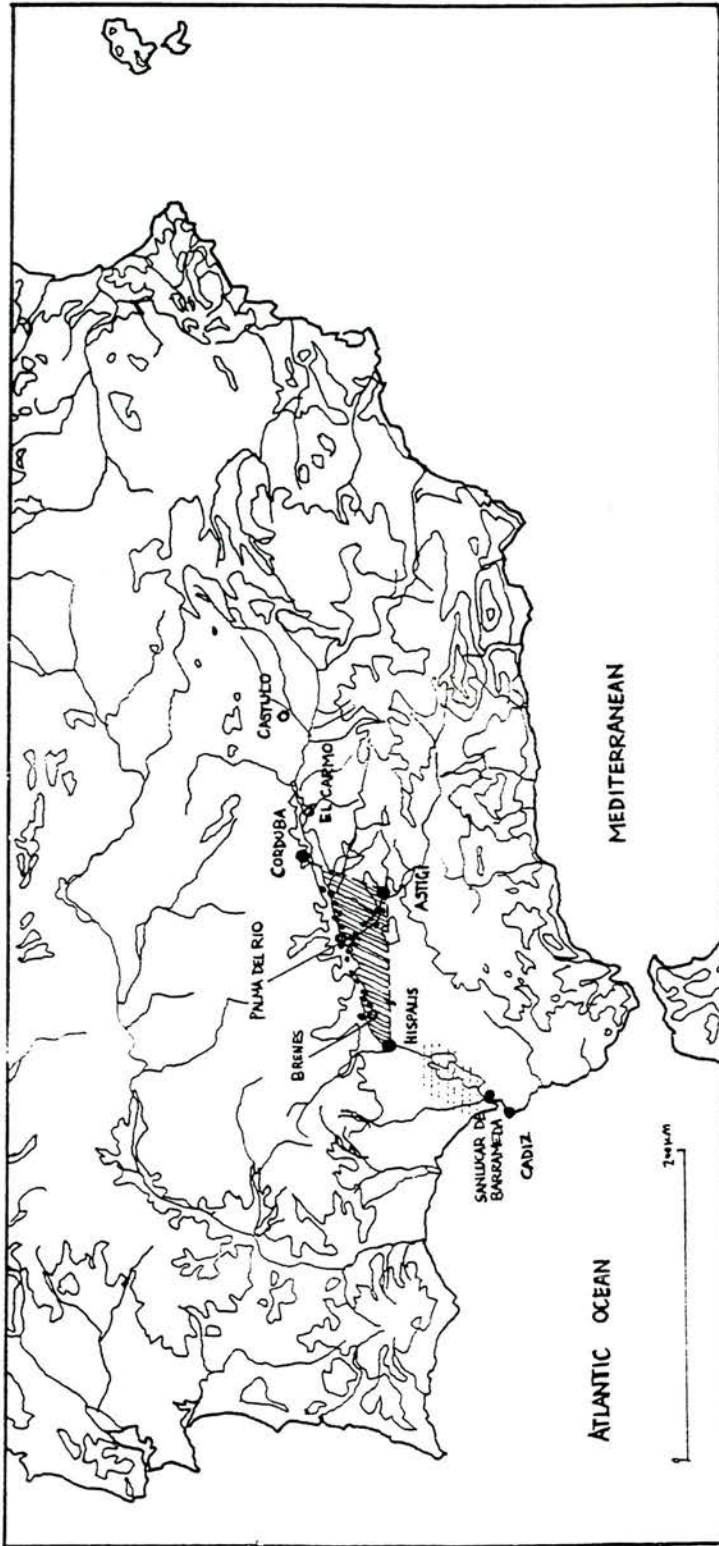


Fig. 30: Kiln sites of the Guadalquivir Valley (after Ponsich, M (1988) fig. 3)

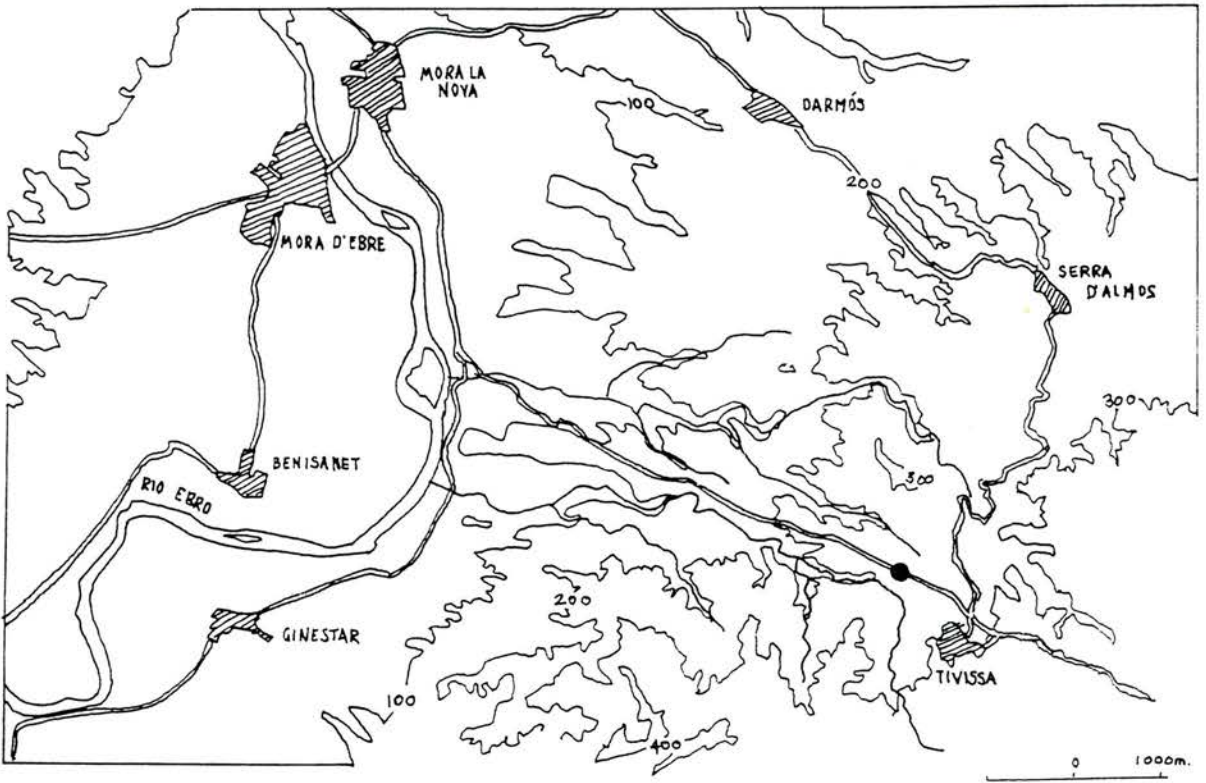


Fig. 31: Tivissa and its environs (after Revilla Calvo, V (1988) fig. 1)

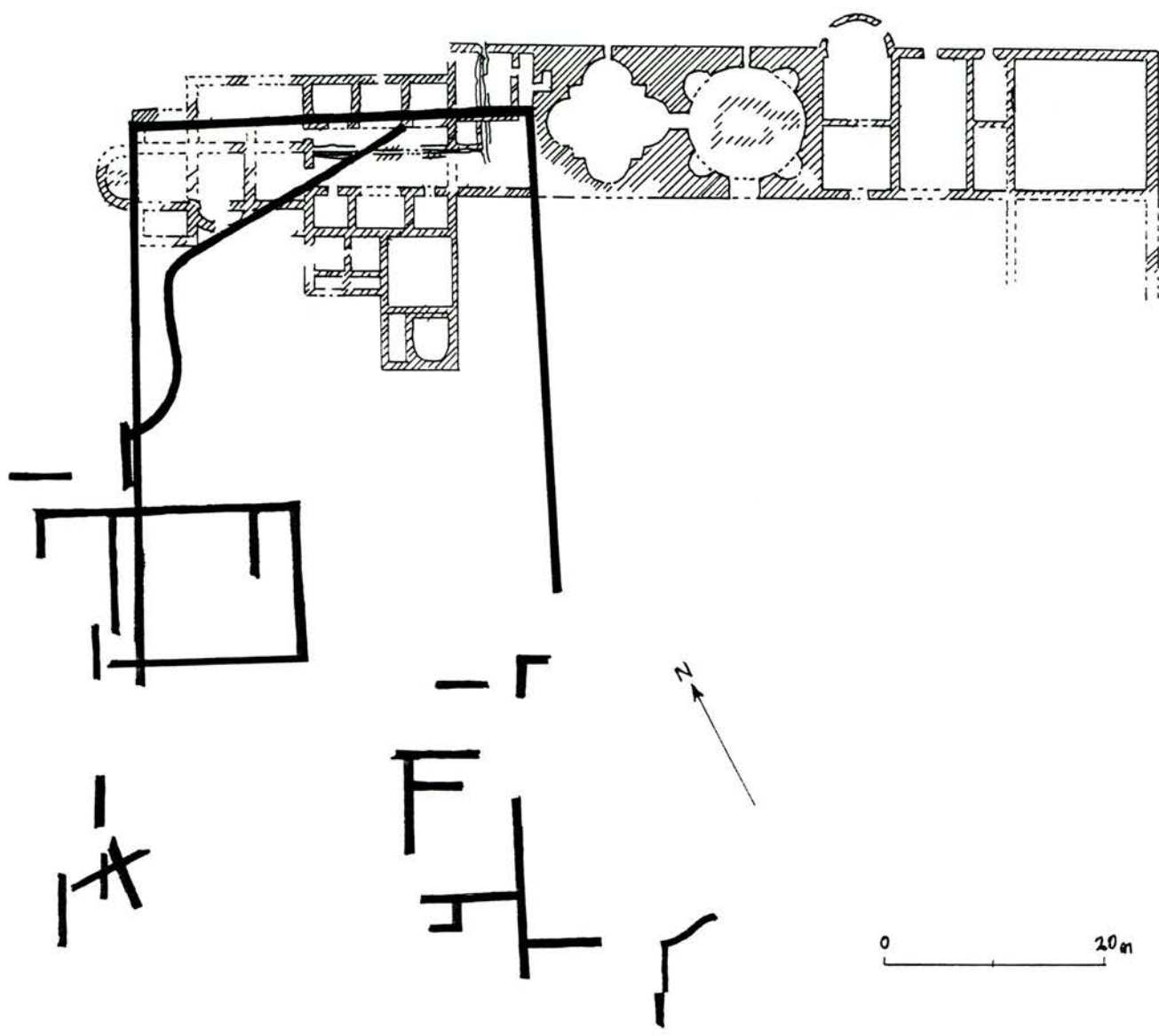


Fig. 32: The Villa at Centcelles -features in black are pre Fourth Century AD. shaded are Fourth Century AD (after Carreté, J Ma et alii. (1995) fig. 1.8)

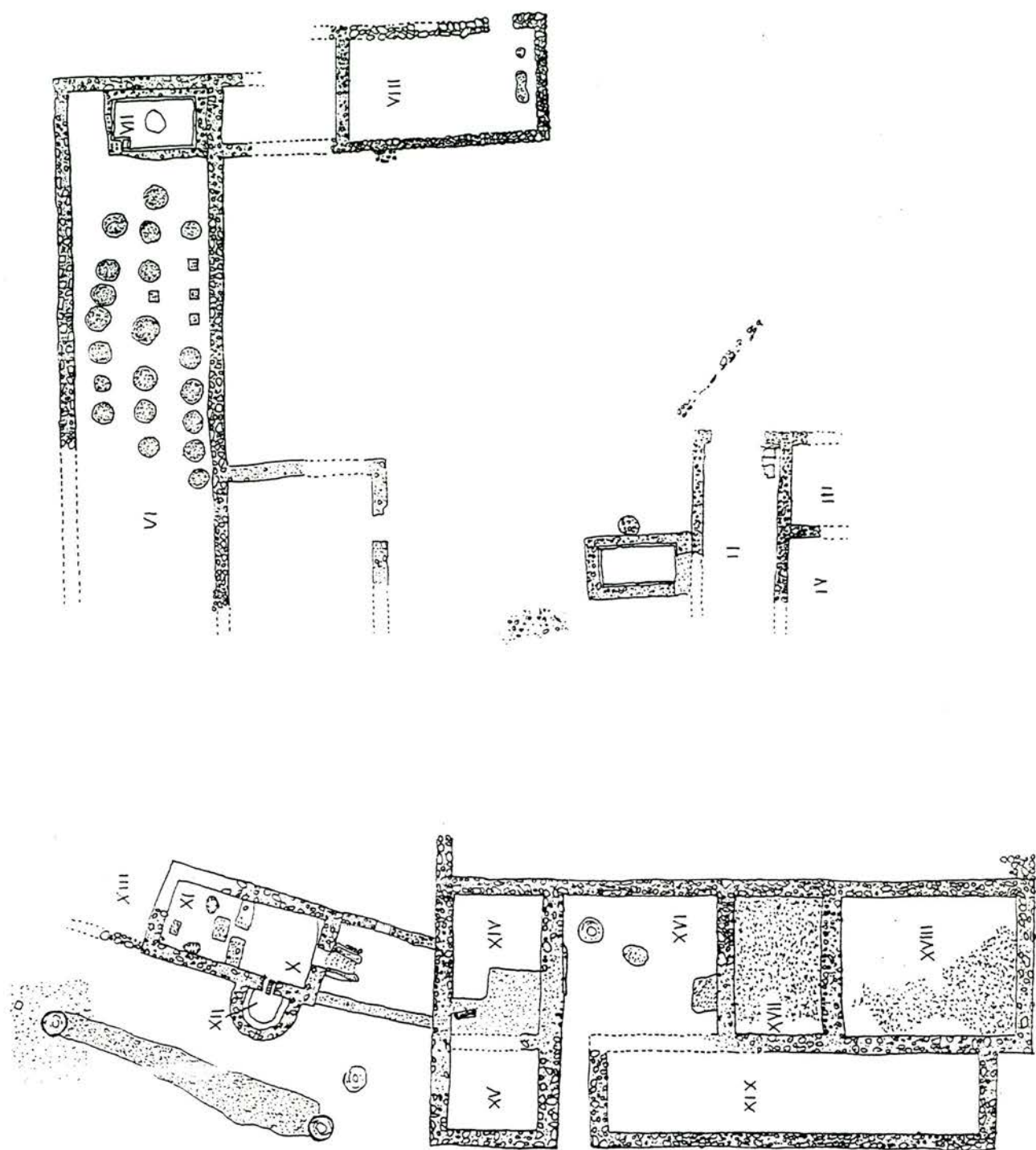


Fig. 33: The Villa at Font del Villar (after Tremoleda, J et alii. (1995) fig. 2)

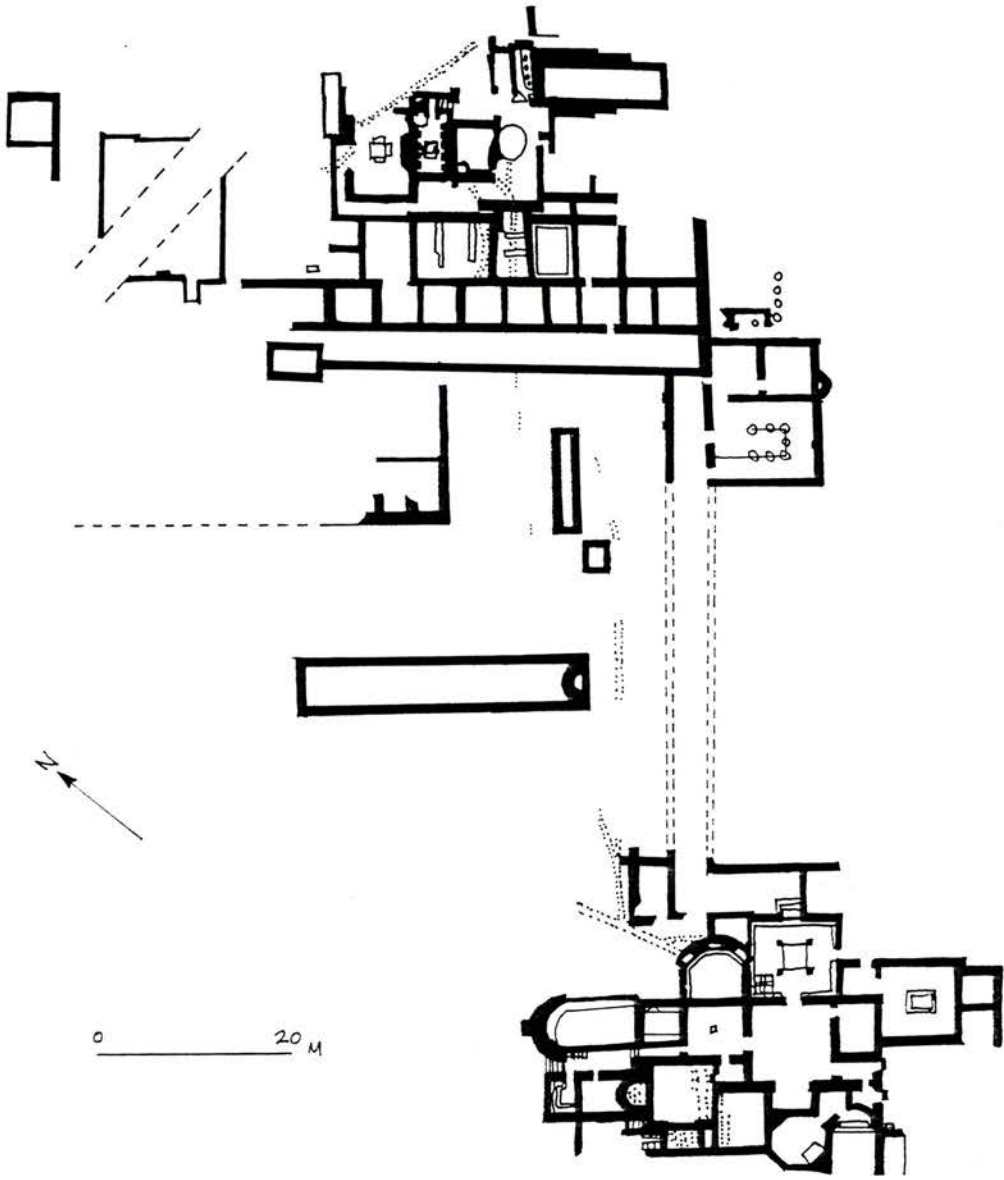


Fig. 34: The Villa at Els Munts (Altafulla) (after Carreté, J Ma et alii. (1995) fig. 1.7a)

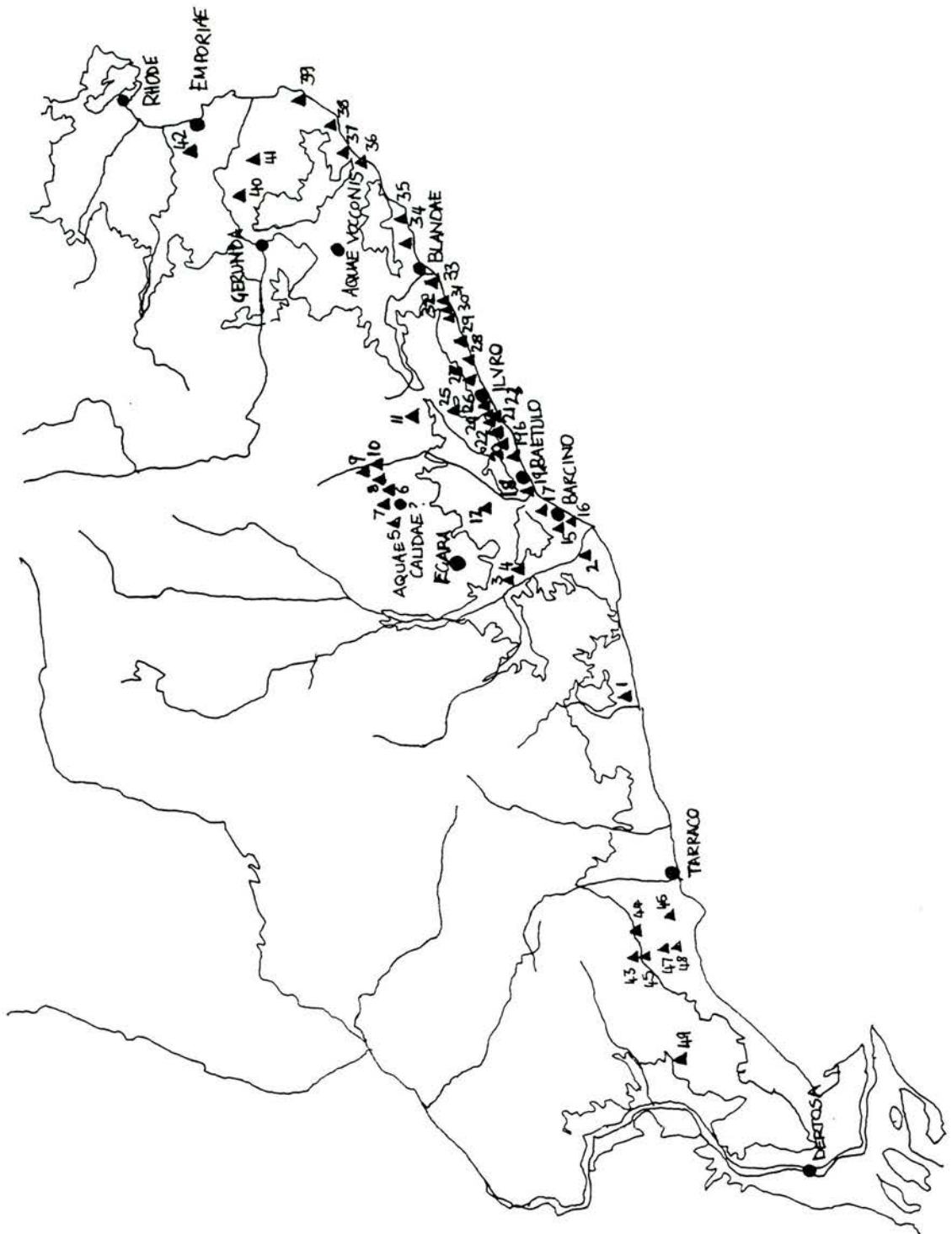


Fig. 35: Kiln and villa sites in Cataluña

1 Adarró 2 Sant Boi de Llobregat 3 Can Pedrerol de Baix 4 Can Tintorer 5 Carrer Balmes 6 Carrer Espartero 7 Cararach 8 Sant Miquel dels Martres 9 Can Vendrell 10 Can Cabot 11 Can Collet 12 Santa Maria de les Feixes 13 La Saut 14 Can Feu 15 Nostra Senyora del Port/Gran Via 18 Montjuic 17 Avinguda Francesc Cambó 18 Badalona 19a Can Valls & Can Cabanyes 19b Can Riviere 20 Alella 21 Torrent de Sistres 22 Club de Tennis Barcelona 23 Riera de Teià 24 Veinat de Sant Crist 25 Sant Sebastià d' Argentona 26 Torre Llauder 27 Riera de Sant Simó 28 El Morrell 29 El Sot del Camp 30 Torre Martina 31 El Morè 32 El Roser 33 Can Viader 34 Fenals 35 Mas Carbotí 36 Can Llavarons 37 Cap Roig 38 Palamós 39 Llafranc 40 Riera Pelagret 41 El Viaró 42 La Bomba 43 Mas de Coll 44 La Boada 45 Els Antígons 46 Mas de l' Antoni Corts 47 Timba del Castellot 48 Molins Nous 49 L'Aumedina (Tivissa)

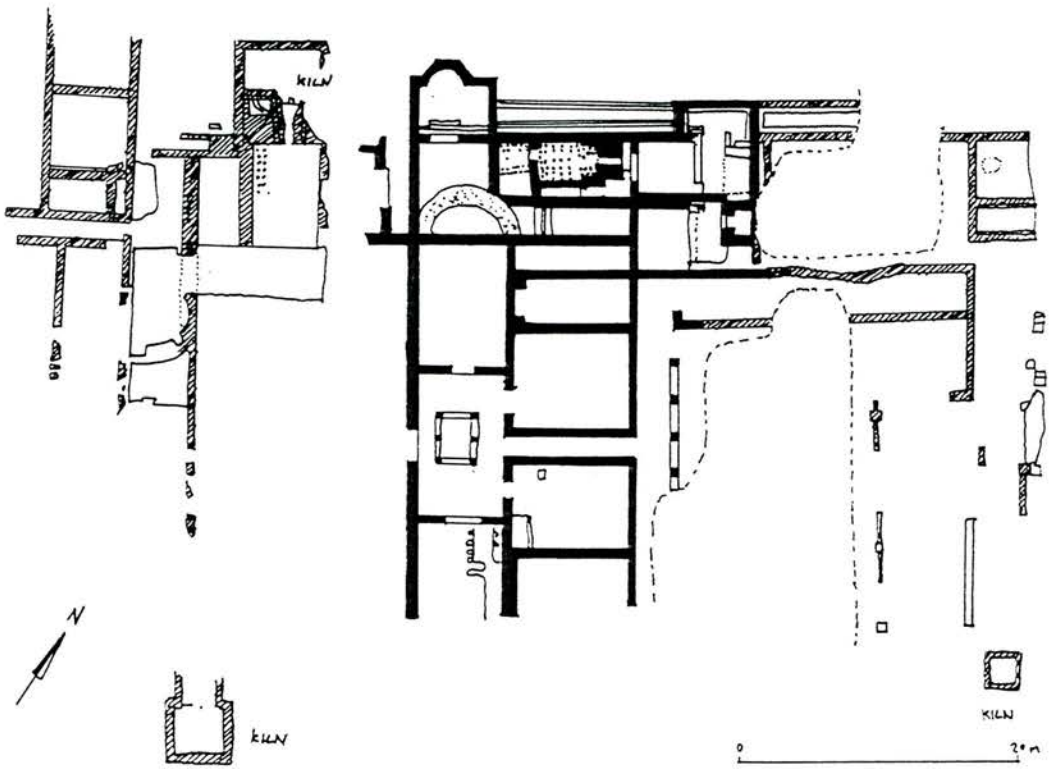


Fig 36: Torre Llauder (after Prevosti, M and Clariana, J F (1987) fig. 1.1)

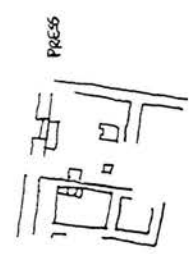
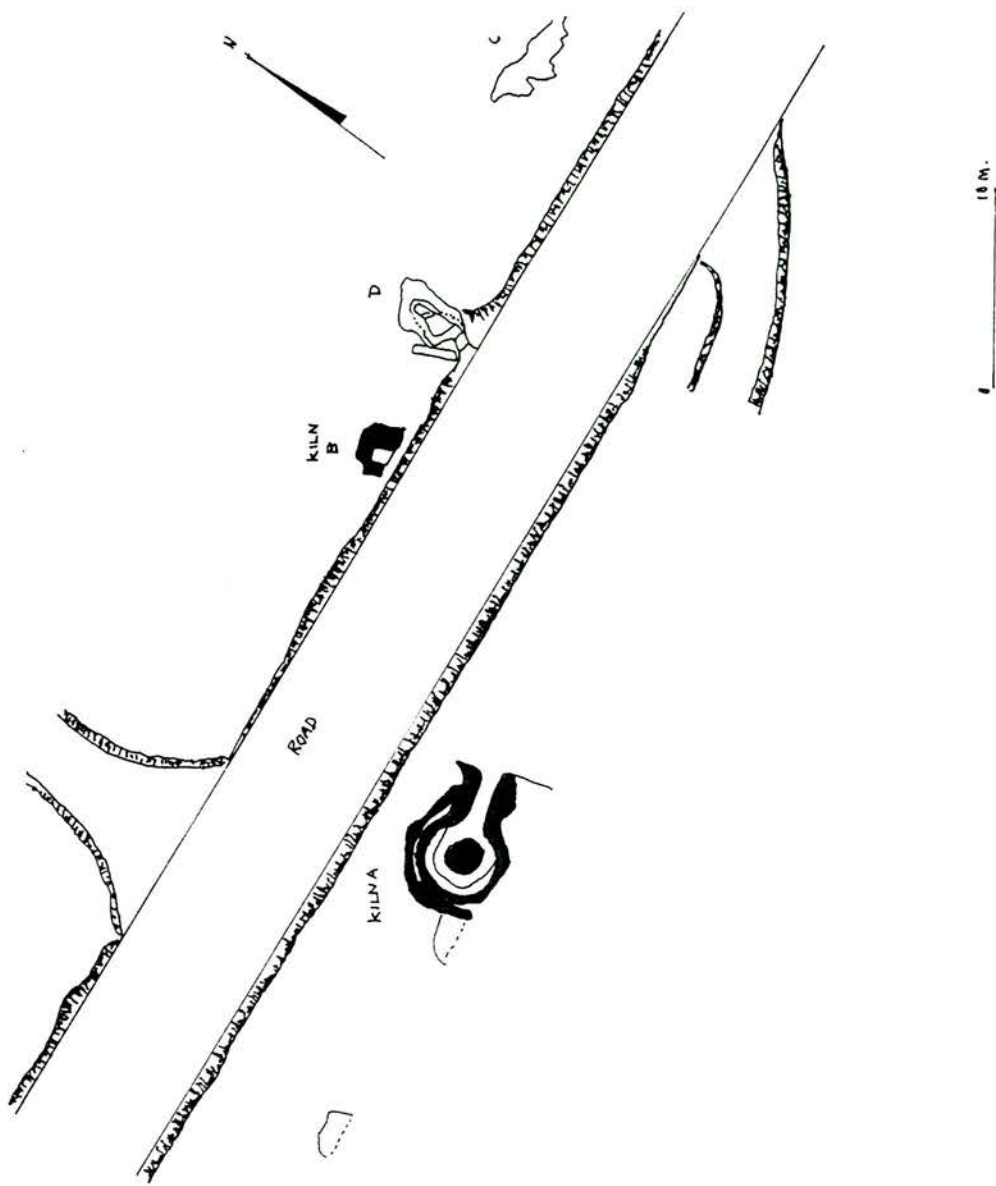


Fig. 37: Plan of the Kilns at Tivissa (after Revilla Calvo, V (1993) fig. 2)

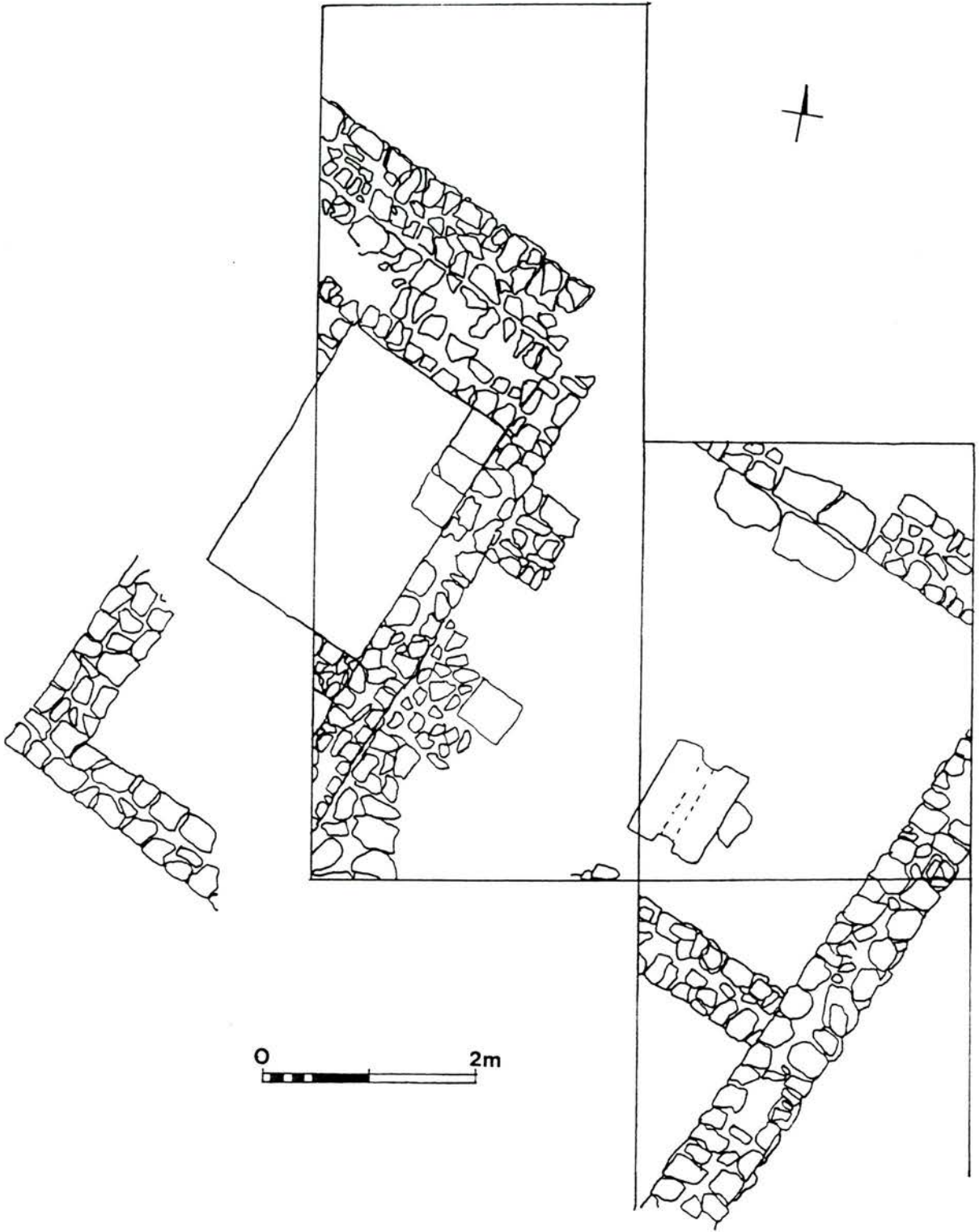
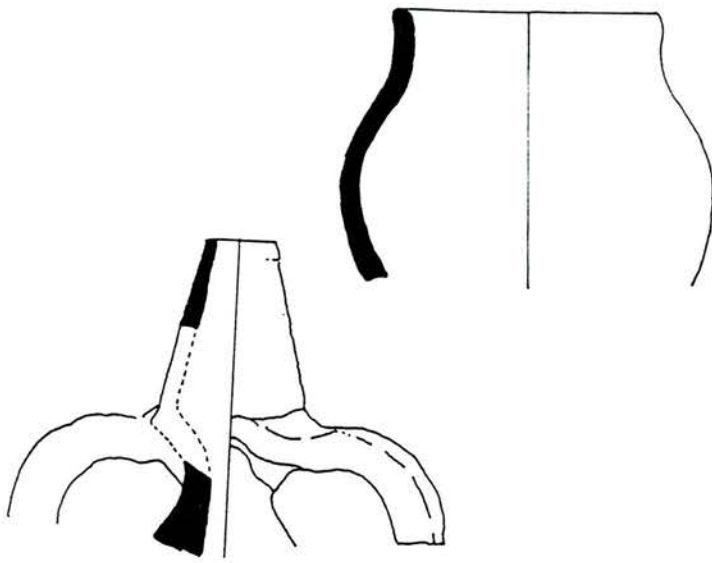
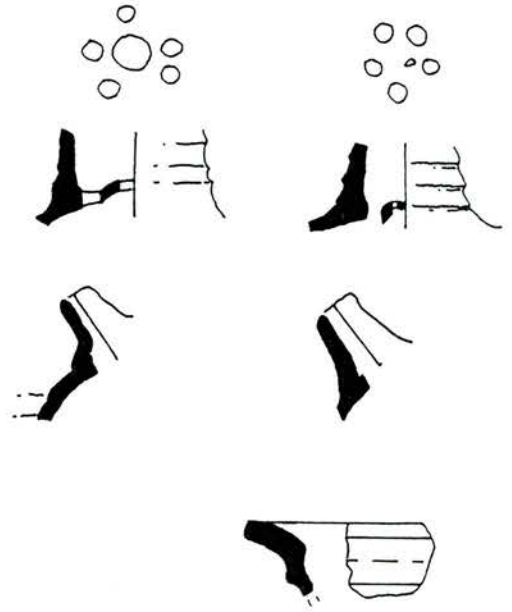


Fig. 38: Plan of the Wine Press at Tivissa (after Revilla Calvo, V (1993) fig. 3)



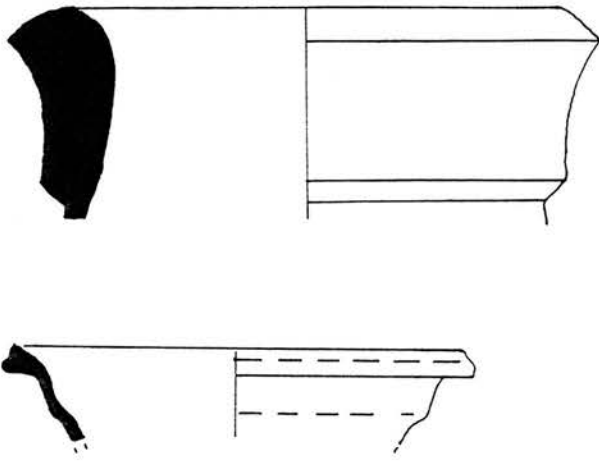
1 W3.16 (after Reynolds, P (1993) Plate 51)

2 W3.6 (after Reynolds, P (1993) Plate 49)



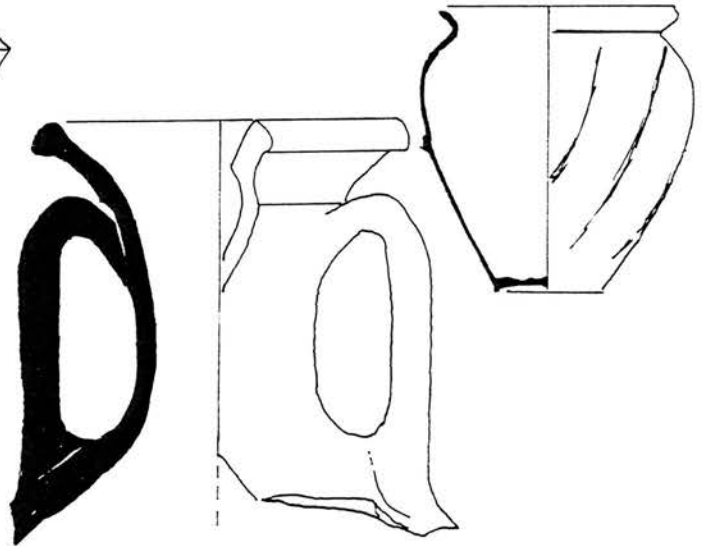
3 W11g.8 (after Reynolds, P (1993) Plate 63)

4 Keay type 4 fabric 19 (after Carreté, J Ma (1995) p. 141)



5 Keay type 5 fabric 19 (after Carreté, J Ma (1995) p. 141)

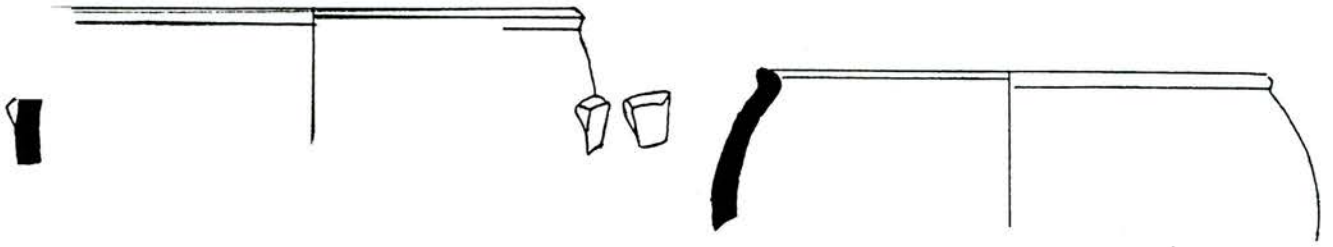
6 Fragment of a Dr 7 amphora from Punta de l'Arenal (after Martin, G and Serres, Ma D (1970) fig. 33)



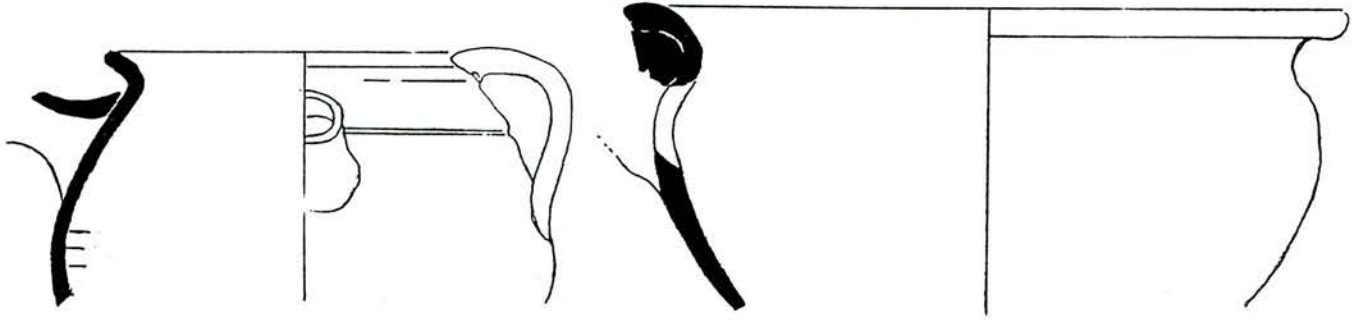
7 Dr 7-11 amphora from Carthago Nova (after Martín Camino, M et alii (1991) fig. 5.18)

8 Mayet XXIV containing ochre from Carthago Nova (after Martín Camino, M et alii. (1991) fig. 5.19)

Fig. 39: Locally produced coarse wares and Dr 7-11 amphorae

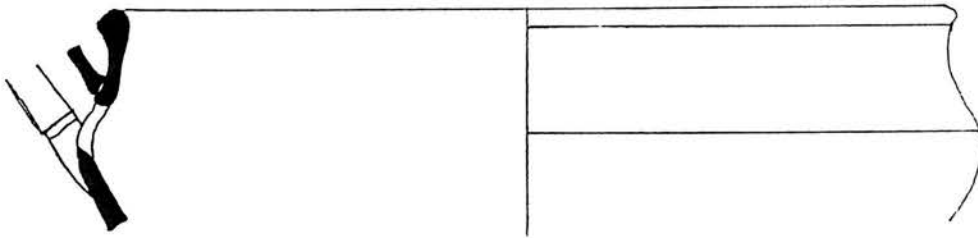


1 HW 7.1 (after Reynolds, P (1993) plate 67)

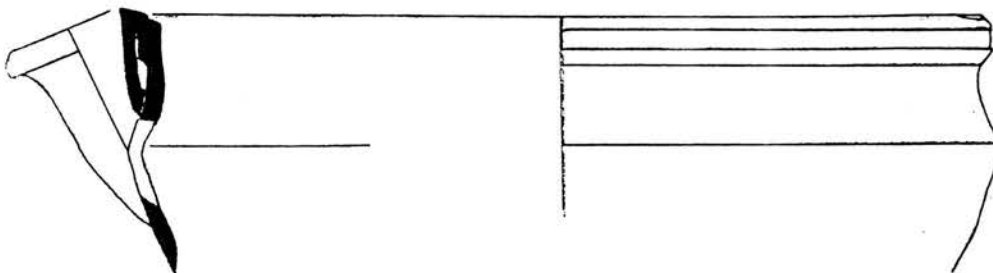


2 W1.18a (after Reynolds, P (1993) plate 10)

3 W1.18b (after Reynolds, P (1993) plate 10)



4 W1.18c (after Reynolds, P (1993) plate 10)



5 W1.18d (after Reynolds, P (1993) plate 11)

Fig. 40: Coarse ware forms used in the preparation of fish sauce



Fig. 41: Distribution of Tarraconensian Dr 7-11 amphorae

1 Fishbourne 2 Nijmegen 3 Neuss 4 Augst 5 Vindonissa 6 Avenches 7 Yverdon 8 Nyons 9 Geneva 10 Lyon 11 Kempten 12 Berne 13 14 Ostia 15 La Chrétienne H 16 Pompeii 17 La Lagaste

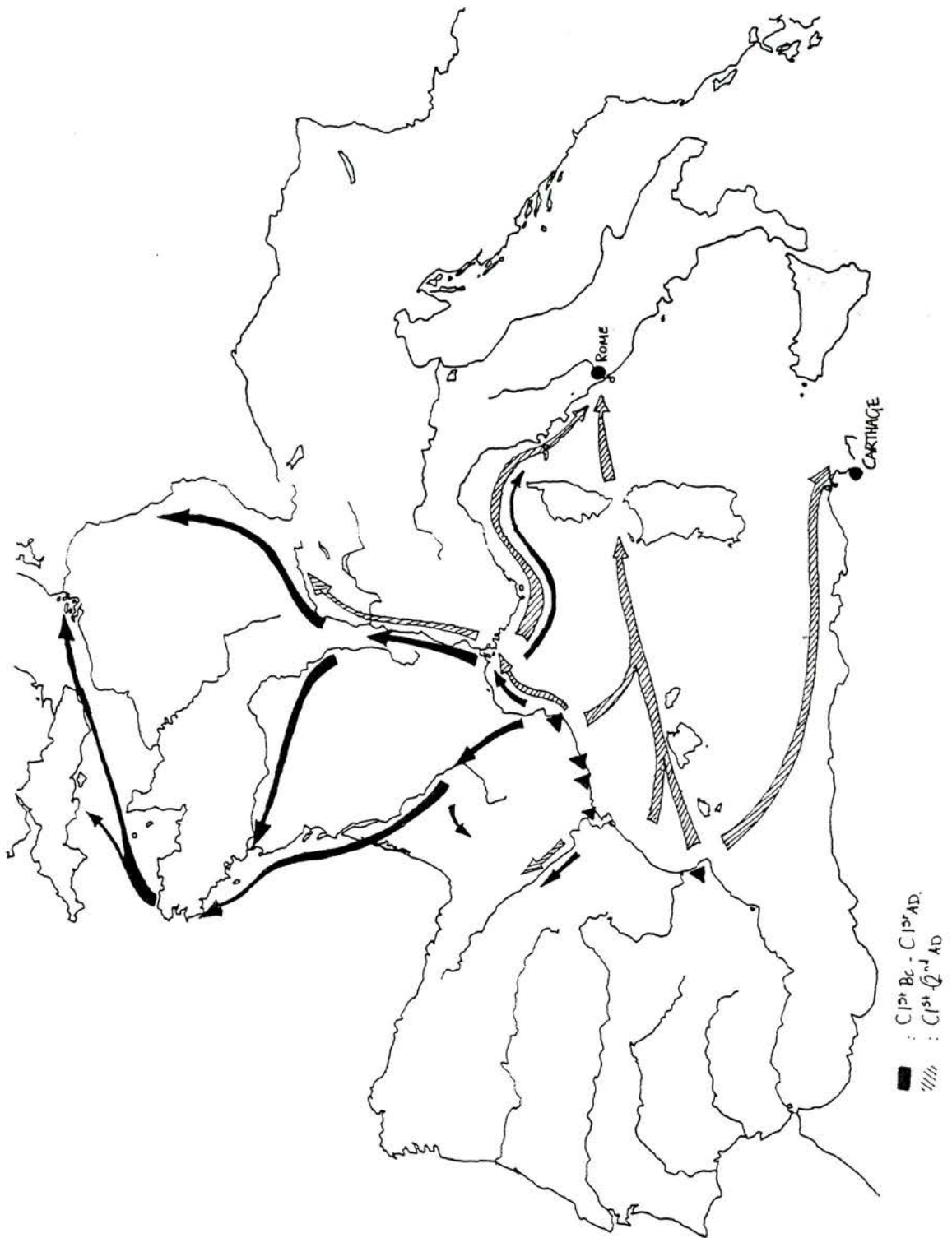
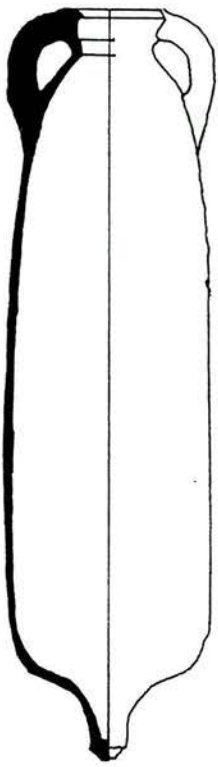
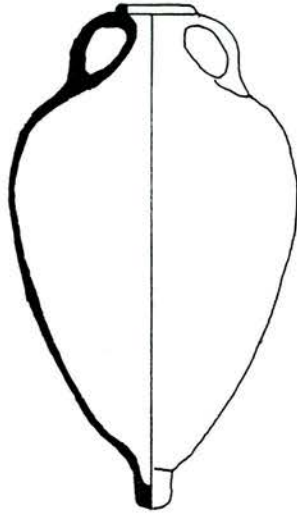


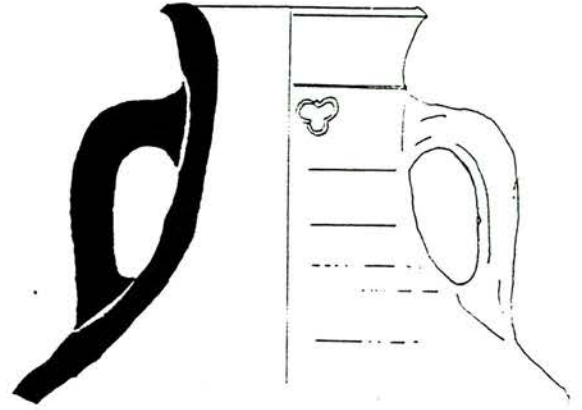
Fig. 42: Trade routes from Tarraconensis



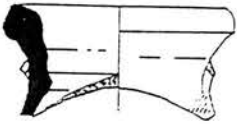
1 Almagro 50 from Port-Vendres (after Peacock, D P S and Williams, D F (1986) fig. 60)



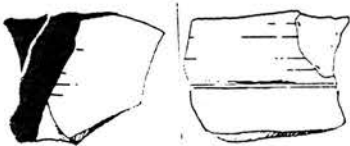
2 Almagro 51 from Planier (after Peacock, D P S and Williams, D F (1986) fig. 62)



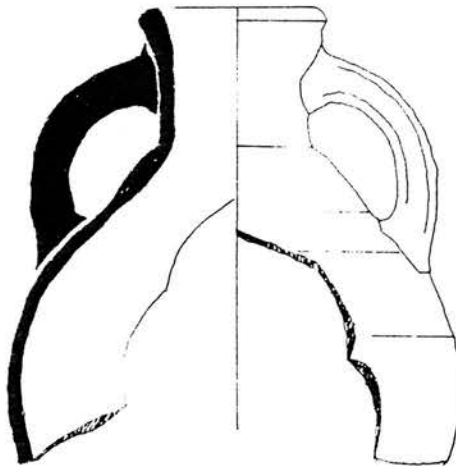
3 Keay XXVb (after Keay, S J (1983) fig. 77.2)



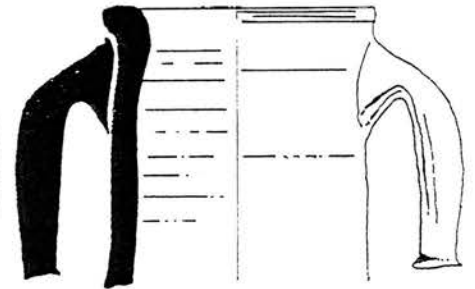
4 Keay XXVk (after Keay, S J (1984) fig. 81.1)



5 Keay LXXVI (after Keay, S J (1984) fig. 169.8)

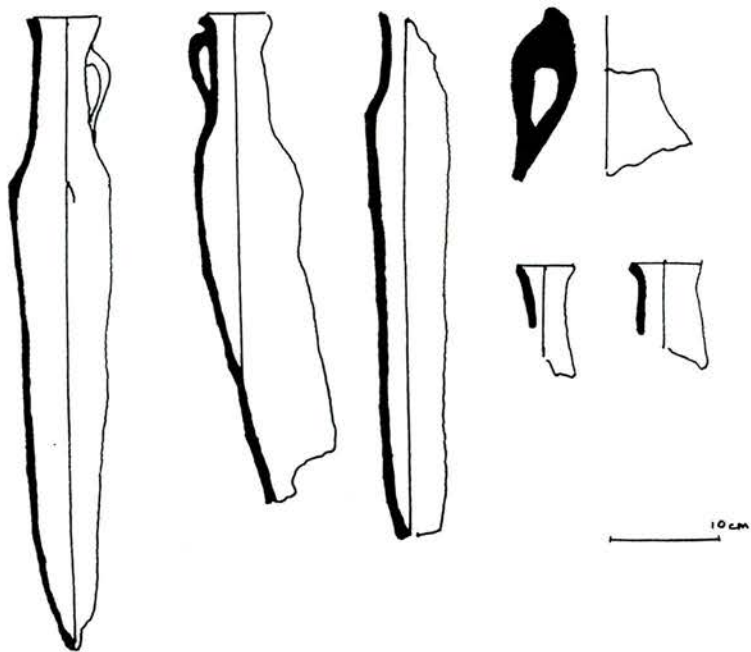


6 Keay XXVII (after Keay, S J (1984) fig. 94.2)

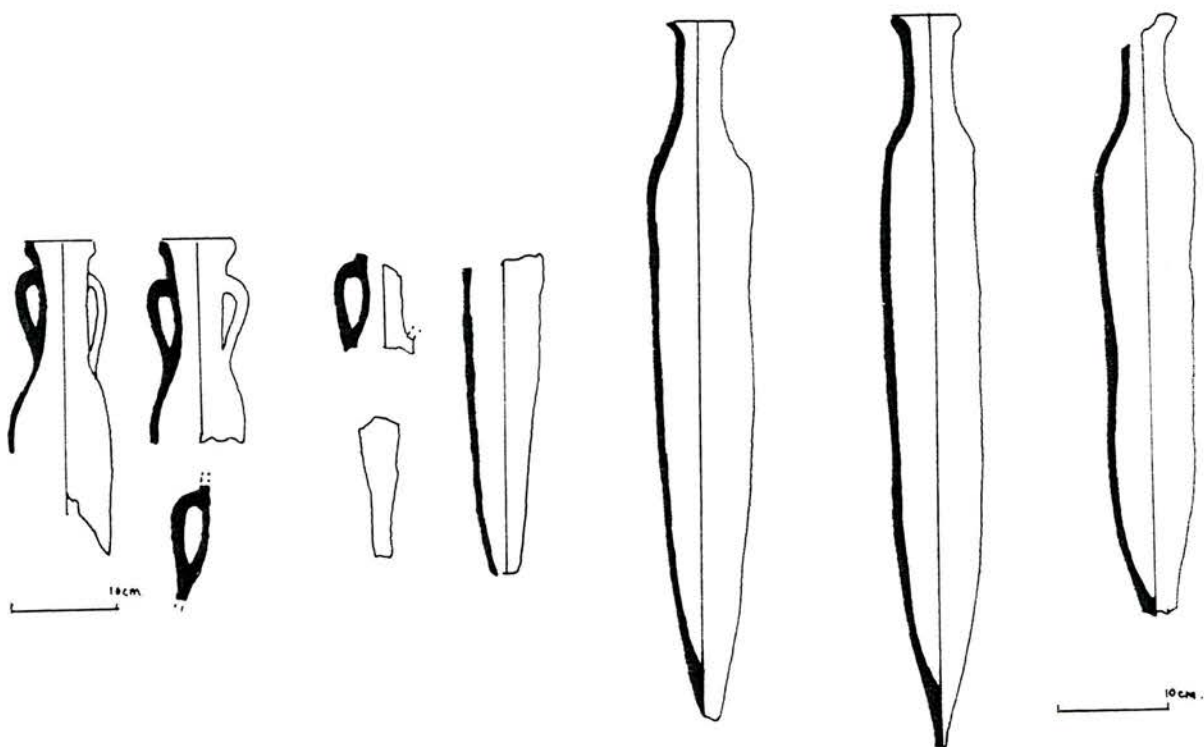


7 Keay XC1a (after Keay, S J (1984) fig. 176.1)

Fig. 43: Late Imperial Fish Sauce Amphorae



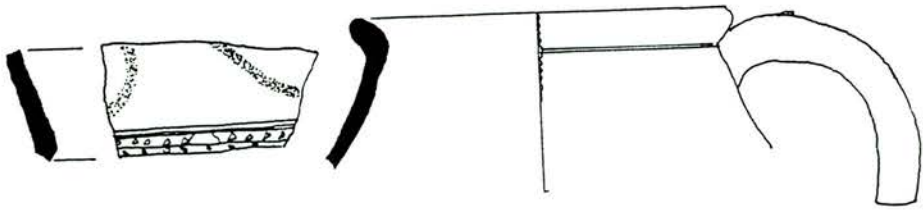
1 Aguilas (after Ramallo Asensio, S (1985) fig. 2)



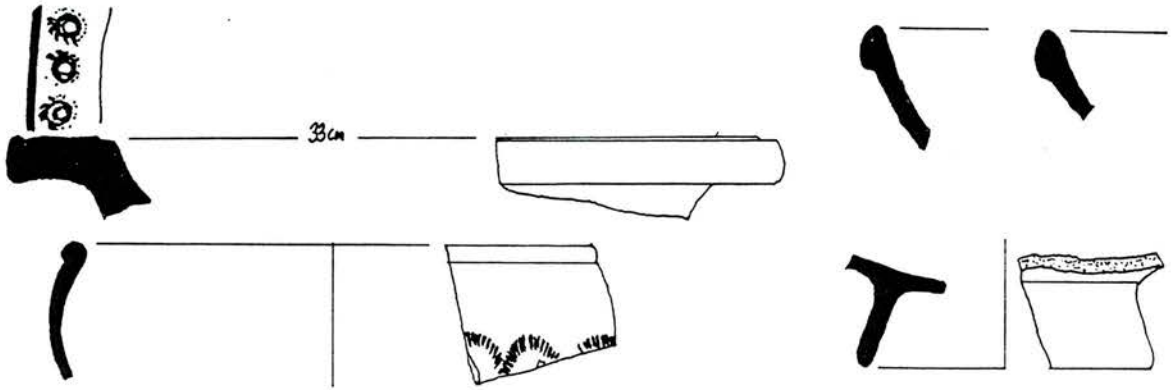
2 El Castellar (after Ramallo Asensio, S (1985) fig. 3)

3 Mazarrón (after Ramallo Asensio, S (1985) fig. 5)

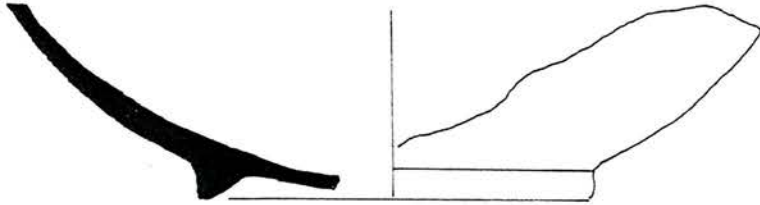
Fig. 44: Late Imperial *spatheia* forms



1 Terra Sigillata Clara *Lucente* (after Bolufer, J (1988) fig. 3, 6)

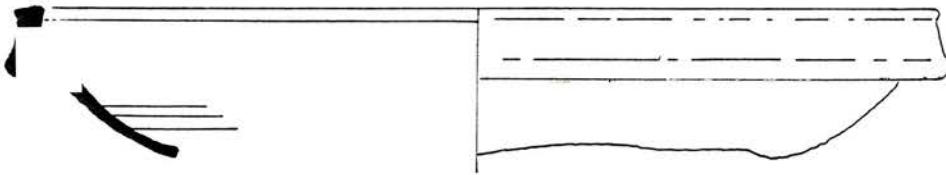


2 Terra Sigillata Paleocristiana Grisa (after Bolufer, J (1988) fig. 9, 12)



3 Terra Sigillata Africana D (after Bolufer, J (1988) fig. 38-40)

4 Late Roman C (after Bolufer, J (1988) fig. 14)



5 Stamped Terra Sigillata Africana D (after Bolufer, J (1988) fig. 47-48)

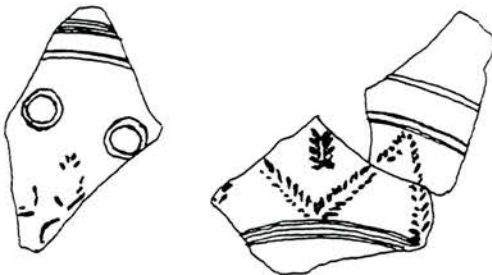


Fig. 45: Late Imperial Fine Wares from Punta de l'Arenal

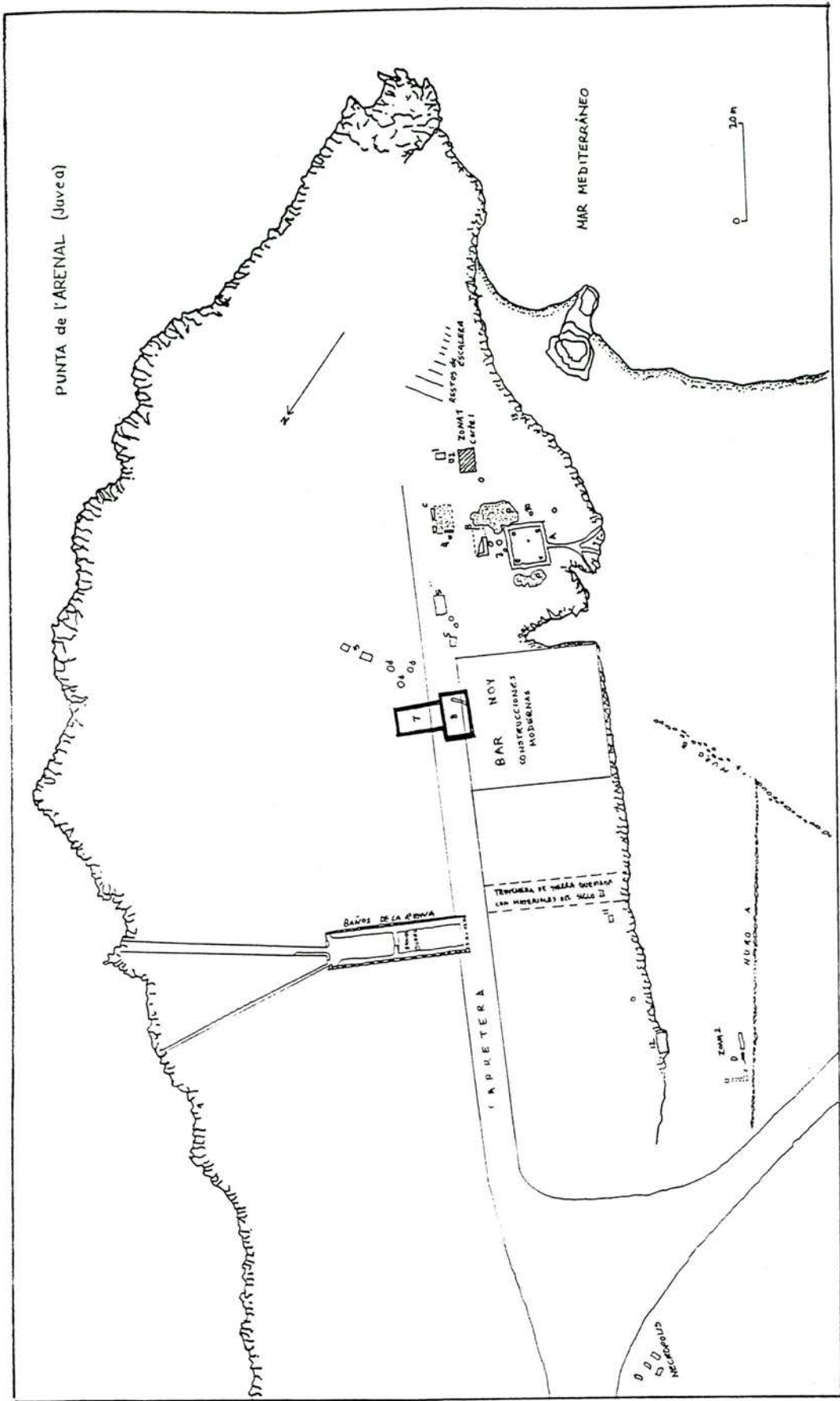


Fig. 46: Punta de l'Arenal, Javea

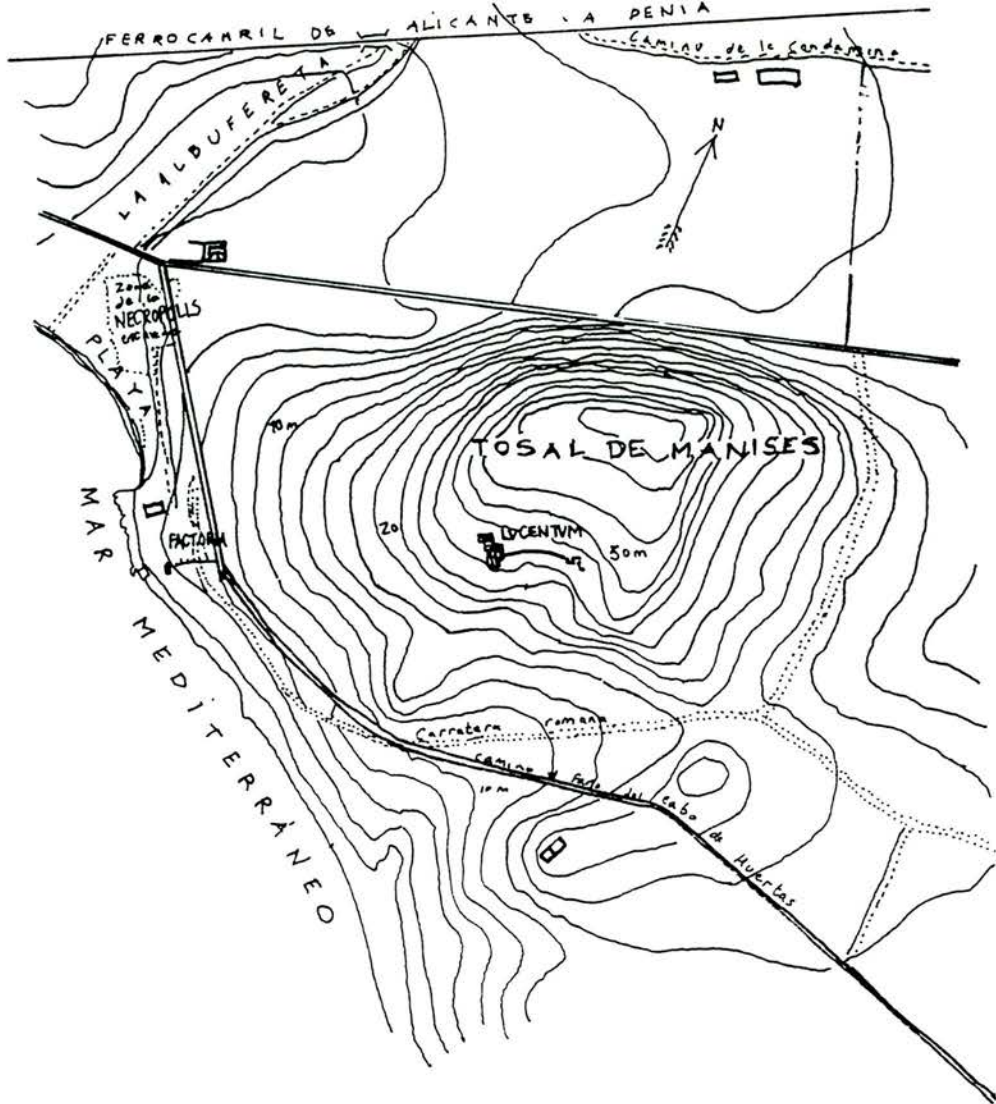


Fig. 47: Tossal de Manises (after Reynolds, P (1993) fig. 31)

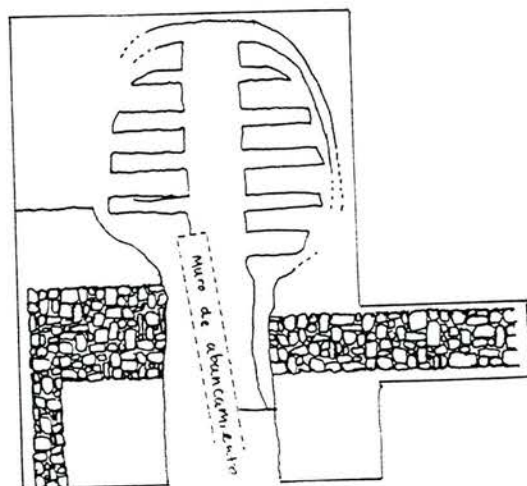


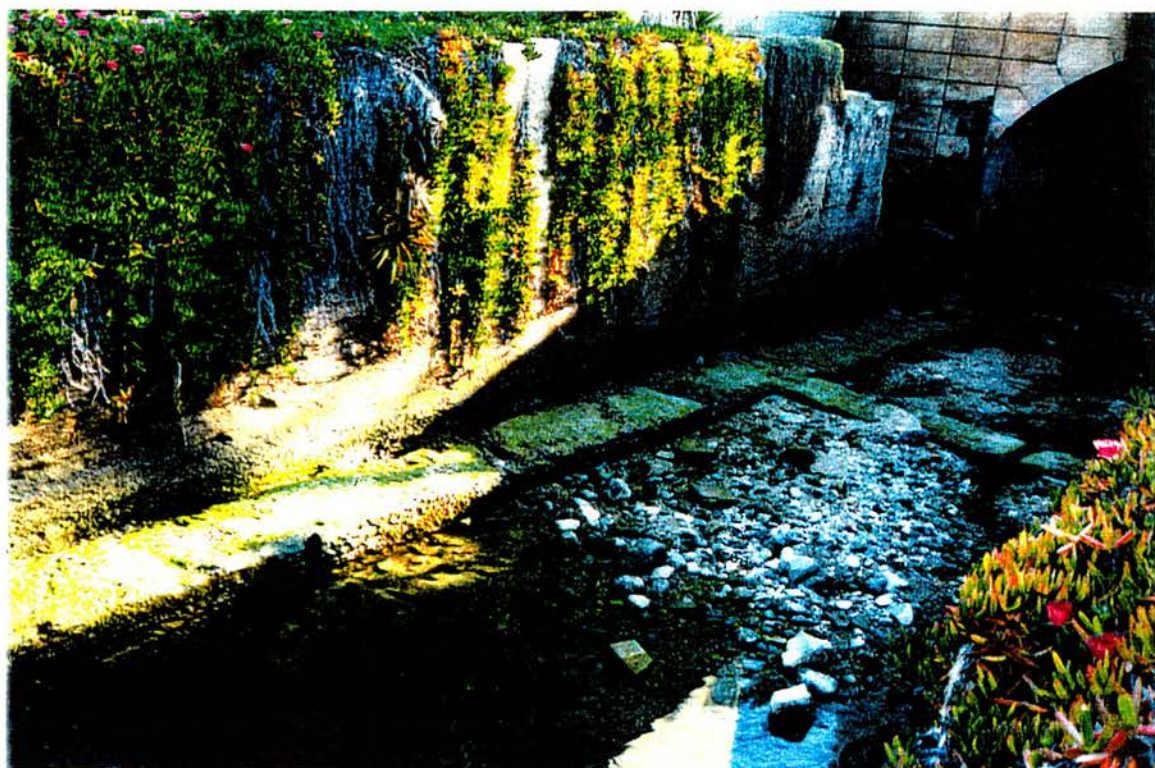
Fig. 48: Plan of the kiln at Mas d'Arago



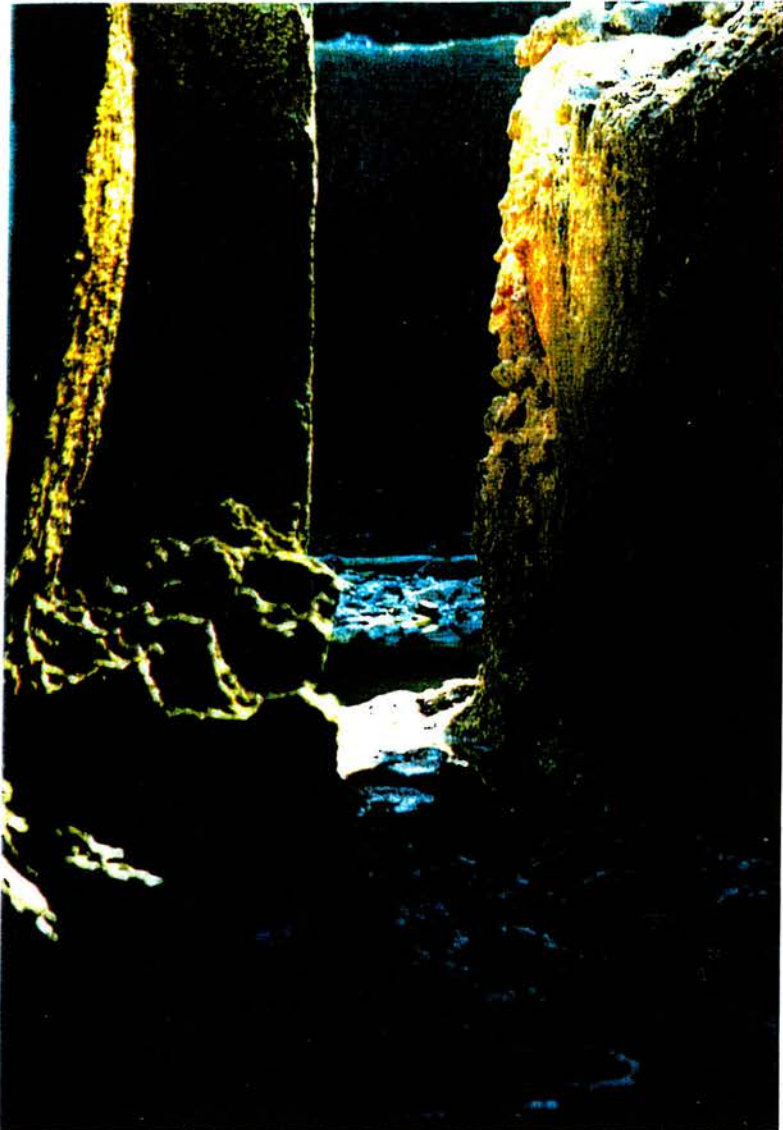
Pl. 1: Peñón d' Ifach, Calpe



Pl. 2: Iberian fortifications, L' Alt de Benimaquia, Montgo



Pl. 3: Baños de la Reina, Punta de l'Arenal, Javea



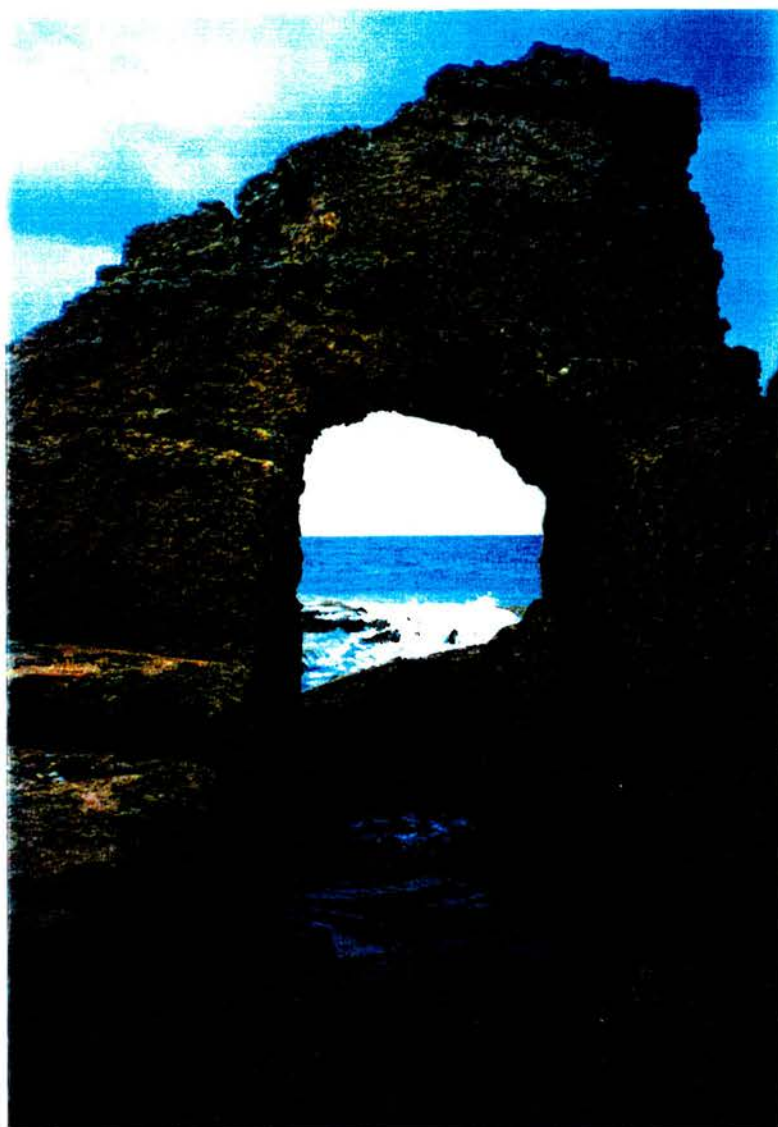
Pl. 4: Drainage channel, Baños de la Reina, Punta de l'Arenal, Javea



Pl. 5: Drainage channel, Baños de la Reina, Punta de l'Arenal, Javea



Pl. 6: Baños de la Reina, Calpe



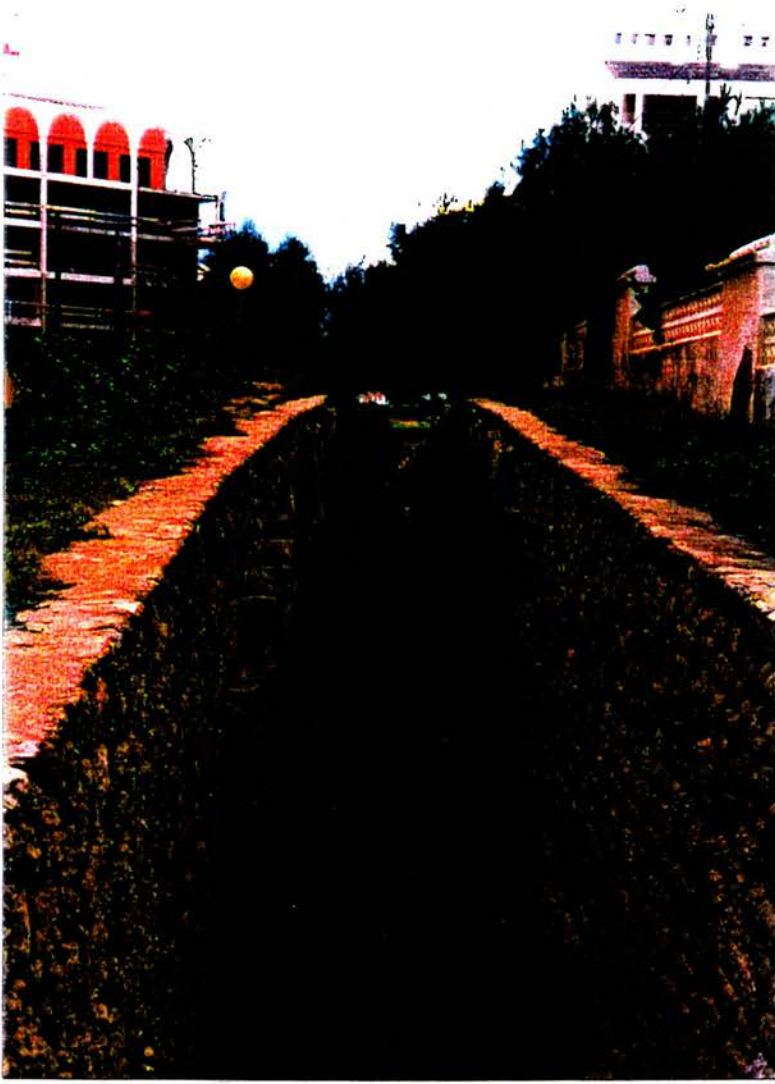
Pl. 7: Sluice channel, Baños de la Reina, Calpe



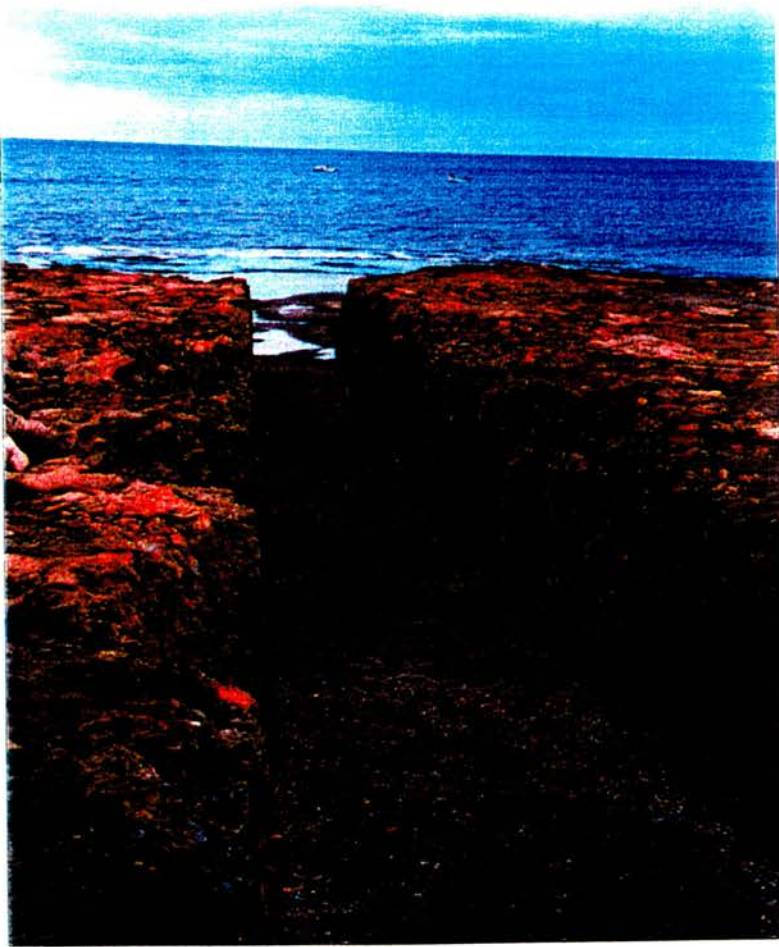
Pl. 8: Villa adjoining the Baños de la Reina, Calpe



Pl. 9: Isla de Tabarca



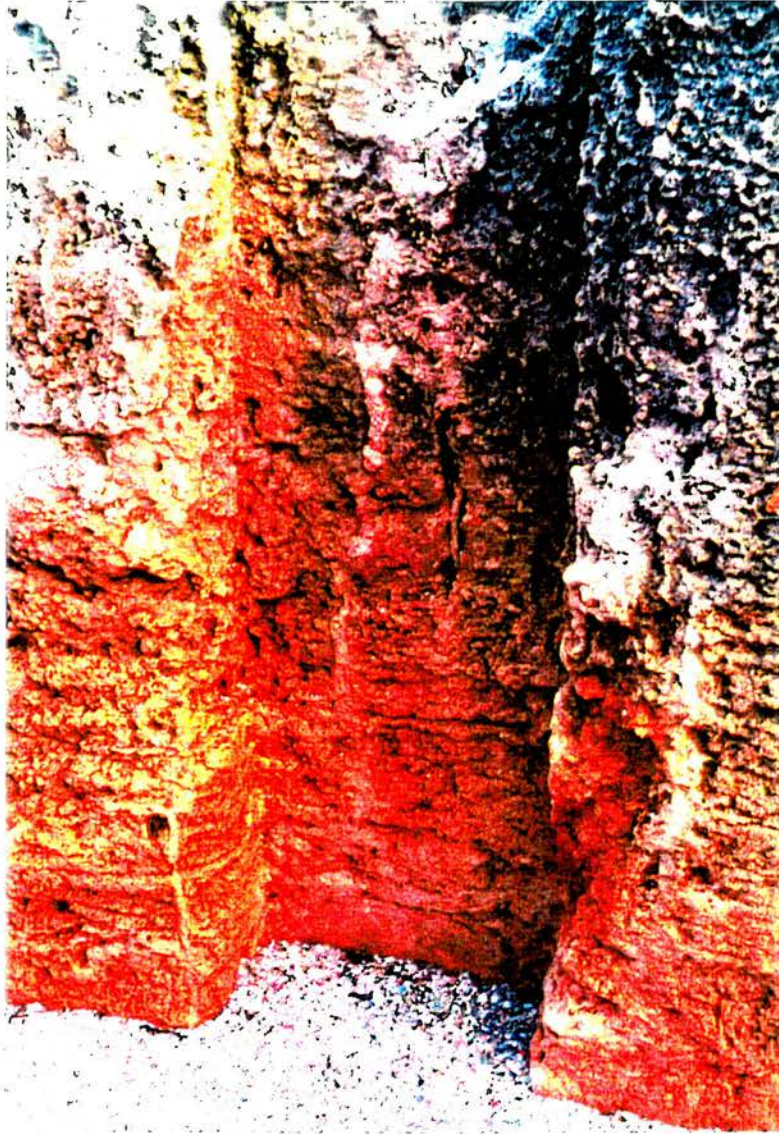
Pl. 10: Acequia de Noria, Javea



Pl. 11: Acequia de Noria, Javea



Pl. 12: Ancient salt flats, Las Salinas, Javea



Pl. 13: Sluice gates, Acequia de Noria, Javea



Pl. 14: Salt flats, Santa Pola



Pl. 15: Barrío Helenístico, Ciudadella, Rosas



Pl. 16: Fish vats lined with *opus signinum*, Santa Pola



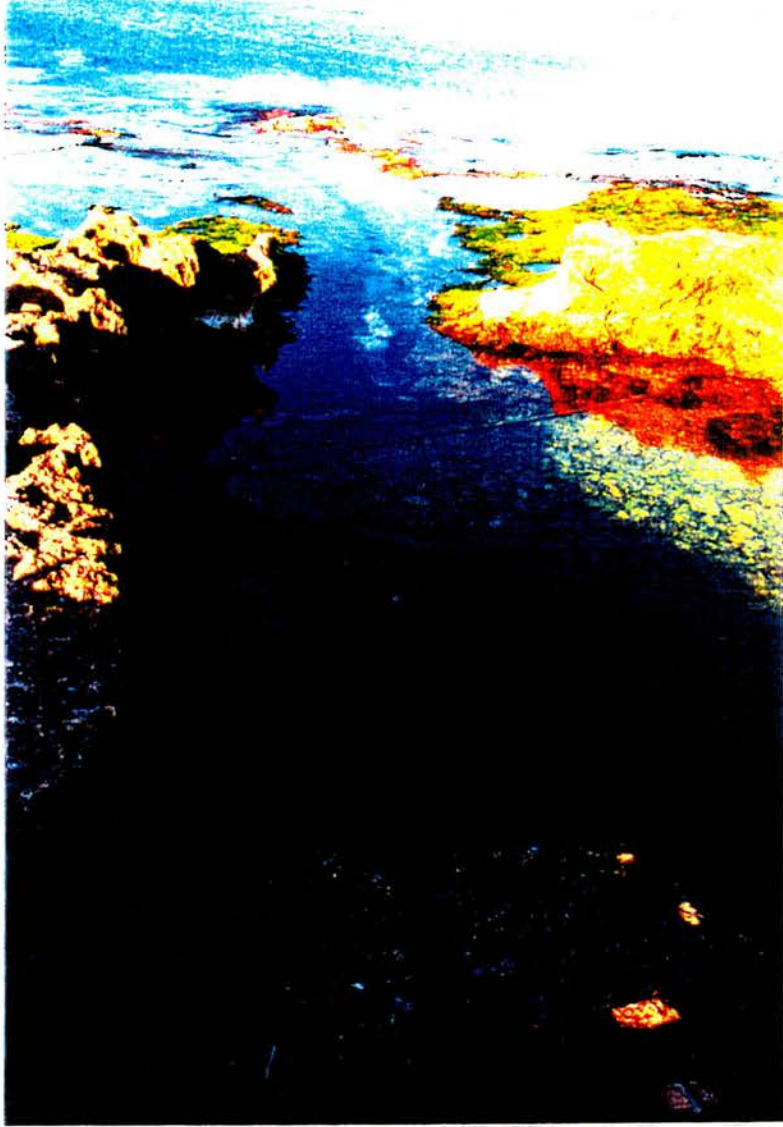
Pl. 17: Habitación A, Punta de l'Arenal, Javea



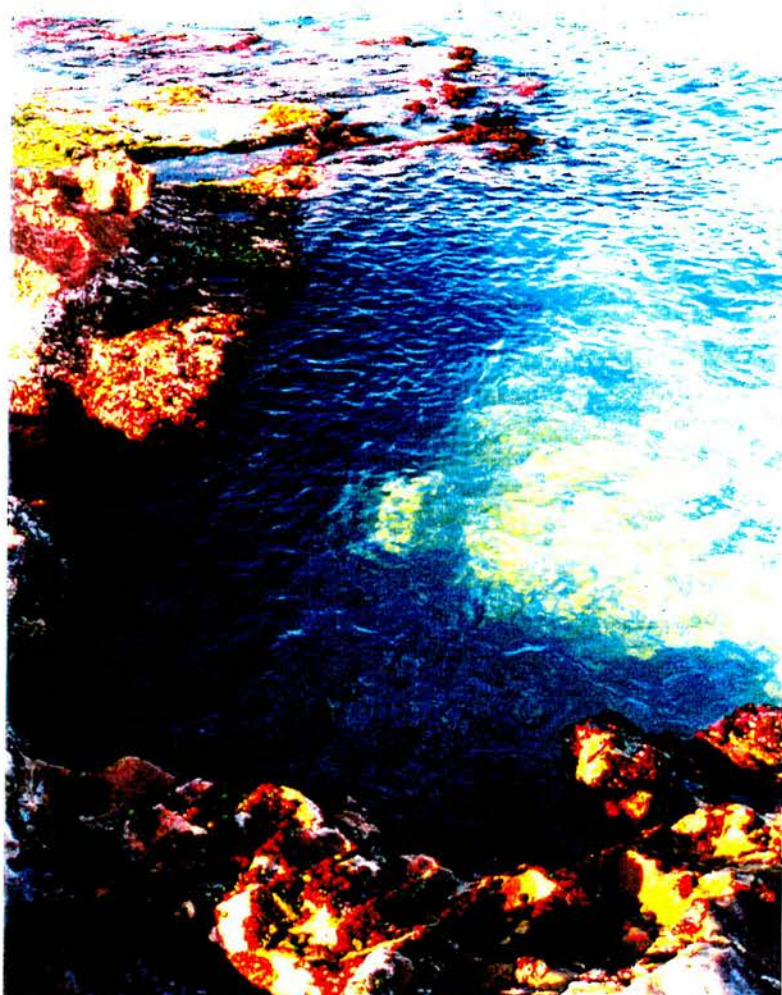
Pl. 18: Habitación B, Punta de l'Arenal, Javea



Pl. 19: Salting vat lined with *opus signinum*, Punta de l'Arenal, Javea



Pl. 20: Fish tank, Punta del Castell, Javea



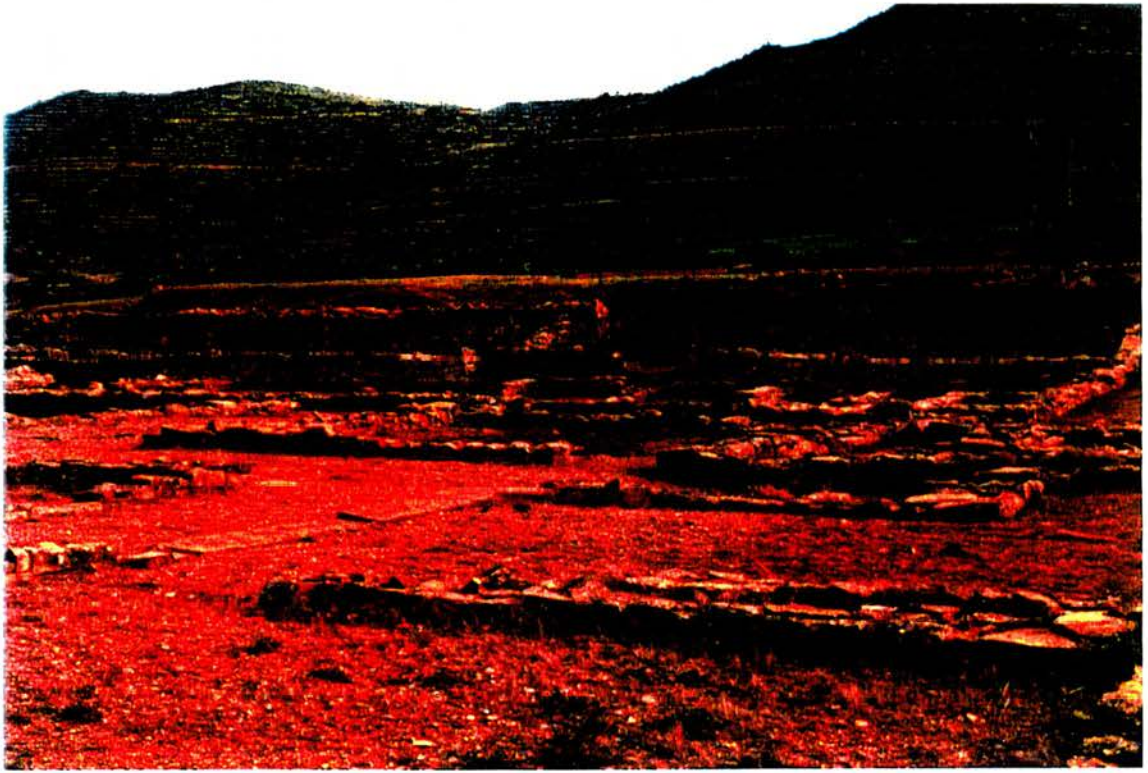
Pl. 21: Fish tank, Punta del Castell, Javea



Pl. 22: Fish factory within the Neapolis, Empùries



Pl. 23: Villa Fortunatus, Fraga



Pl. 24: Villa at Liedena, Navarra



Pl. 25: Hellenistic Harbour Wall, Empùries



Pl. 26: Isla de Portichol



Pl. 27: The Javea region towards Cabo de la Nao to the South