BRITANNIA AND THE IMPORTS OF BAETICAN AND LUSITANIAN AMPHORAE*

by

César Carreras Monfort**

Abstract: This paper describes the original distribution of some peninsular amphorae in Roman Britain, chiefly Dressel 20, Haltern 70 and Baetican and Lusitanian fish-sauce vessels. Their outstanding presence and distinctive location deserved a thorough study by means of simulation analyses on transport cost. As a result, a couple of simulation models were implemented in ARC/INFO to discover the routes of exchange mechanisms employed to transport the amphorae.

Key-words: trade; amphorac; Atlantic.

Resumen: Este artículo describe la original distribución de algunas ánforas peninsulares en Britannia, principalmente Dressel 20, Haltern 70 y los contenedores béticos y lusitanos de salazones. Su destaca presencia y distintiva localización merecían un estudio pormenorizado a partir de análisis de simulación de costes de transporte. Como resultado, se implementaron un par de modelos de simulación en ARCI INFO para descubrir que rutas y mecanismos de intercambio fueron empleados para transportar las ánforas.

Palabras-clave: comercio; ánforas; Atlántico.

> *"The Romans learned all about the voyage ... (Publius Crasus) he forthwith laid abundant information before all who wished to traffic over this sea, albeit a wider sea than which separates Britain from the Continent. So much, then, Iberia and the islands that lie off its coast" (Strabo* 11.5.1 *l).*

The beginnings of amphorae scholarship are closely related to the Roman province of *Britannia.* One of its pioneers, M. H. Callender, initially studied amphorae assemblages and stamps from Corbridge, a Roman military camp on Hadrian's Wall (Northern England) (Callender, 1948). There, he realised that most amphorae stamps documented in Romano-British sites came from the Iberian

* English version reviewed by D. Silver and by Charlotte Nielsen. **
E-mail: ccarreras@campus.uoc.es

Peninsula: they were recorded on amphorae Dressel 20, a type originating in the province of Baetica. Afterwards, he took on the remarkable task of compiling an extensive index of amphora stamps from Westem Europe, which was completed by 1950.

Unfortunately, his thesis on amphora stamps remained unpublished until 1965 (Callender, 1965), so the importance of Baetican amphorae in the trading contacts with the Northern provinces was unknown to his contemporaries. His pioneering work was later valued by other scholars, who went on to pursue some areas of research already proposed by him in his foreword: "if research on amphorae is to proceed much further, ¡t is to undertake scientific excavations in South Spain and on the Monte Testacciol

New generations of British archaeologists followed Callender's steps, developing a more scientific approach to amphora studies, which included petrological and physic-chemical analysis of fabrics and contents. The most significant figures in this field in Roman Britain are D. P. S. Peacock, D. F. Williams (1986) and P. R. Sealey (1985), whose work has revealed the wide variety of typologies and origins of imported amphorae in the British Isles. However, research on amphora stamps and epigraphy in Britain has not developed since Callender's times, despite new advances in the subject due to the results from Mte. Testaccio and some shipwreck excavations.

That is why P. P. A. Funari (1996) resumed the early work by Callender and studied the amphora epigraphy from three regions in *Britannia:* Hadrian's wall, the South-eastern region and Wales. Funari's research was completed by the present author, who studied the epigraphy of other regions as well as undertaking a quantified analysis of amphorae from 104 sites (Carreras and Funari, 1998)'.

One of the conclusions to he drawn from all these works is Britain's dependence on Mediterranean imports in the Principate. Most amphorae recorded in Britain carne from the Iberian Peninsula in such percentages (60-70% Dressel 20, 5% salazones amphorae, 3% Haltem 70) as to reveal an especially intensive commercial relationship, unnoticed so far, which deserved a thorough explanation.

1 Monte Testaccio is an amphora dump found in the middle of the city of Rome, which covers a erimeter of 1.490 meters and is 35 rneters high. lt contains approximately 24.750.000 sherds of broken mphorae. 80% of these sherds are of Dressel 20 amphorae produced along the Guadalquivir valley. Since 989, **a** Spanish team of archaeologists (CEIPAC) leaded by Dr. Blázquez and Dr. Remesal has run easonal ex¿avations on the Mount (http://www.ub.es/CEIPAC/ceipac.html) (Rodríguez Almeida, 1984; ßlázquez *et* ***al.,*** 1994).

2 Both studies were part of an overail project on a Corpus on amphora stamps for Europe conducted ı Spain by the CEIPAC group (DGYCIT PB961218) and by the *Union Académique Internationale in* ßrussels.

OLIVE-0IL CONSUMPTION AND BAETICAN DRESSEL 20 AMPHORAE

The most common container documented in any Romano-British excavation is the well known Dressel 20, an amphora type carrying olive-oil produced in a myriad of workshops along the Guadalquivir valley (Remesal, 1986). lt normally appears in percentages of 60-80% on amphora weights in any assemblage, which is quite impressive considering that, because there were alternative local fats, olive-oil was not regularly consumed in the British Isles before the Conquest. (Carreras and Funari, 1998, 66-72).

So what was the reason for such a consumption pattern? Looking more closely at the Dressel 20 distribution within the province (see figure l), one may distinguish a high concentration of vessels in Northern and Western regions of Britain (Wales and Hadrian's Wall), even higher than the values recorded in regions of Northern Spain (León, Asturias, Castilla la Vieja and Cataluña) that were nearer the production centres. Military contingents occupied these two British regions from the early stages of the conquest, so they were the main consumers of Baetican olive-oil. This legionary pattern of consumption becomes even more obvious when the distribution of Dressel 20 stamps for every period is studied.

In other words, every map of stamp distribution identifies clearly the troop movements at the same time (Carreras and Funari, 1998, 41-57). For instance, Julio-Claudian stamps were concentrated in south-eastern sites such as Colchester, Richborough and London, which was the area pacified at that time. In Flavian times, there was a concentration at Richborough, where the *Classis Britannicae* headquarters were placed, but most stamps were located in Wales, Central and Northem England (Lincoinshire, Lancaster, Yorkshire) at the time of the Agricola campaigns. In the early 2nd century the stamps appear chiefly at Hadrian's Wall and later on the Antonine wall; however after the abandonment of the latter wali in the second half of the century, the stamps are documented again at Hadrian's Wall (Corbridge). In the early third century, the pattern seems almost unaltered, with few concentrations in Scotland (Severus campaigns) and high densities at Hadrian's Wall and the legionary headquarters at Chester and York.

This outstanding amphora distribution is unique in Britain, since apart from the Dressel 20 there is no other amphora type with this clear military consumption. In general, the other amphora types are more commonly used in civilian sites.

Remesal (1986; 1997) already noticed a similar high concentration of Dressel 20 amphorae on military sites in *Germania.* He explained it by the existence of a public military supply of Baetican olive-oil, which he dubbed *"annona militaris "*. The British evidence of Dressel 20 amphorae, with more than 1800 stamps, not only confirms the existence of a distinctive distribution, but also reinforces the idea of a redistributive system responsible for supplying bulk olive-oil to distant

places such as the western Roman frontiers. The Roman State obtained the Baetican olive-oil through taxes *(stipendium)*, public purchases at fixed rate, or expropriations *(indictiones)*. Then, ¡t contracted private traders *(negotiatores, mercatores, navicularii)* by paying their transport fares *(uecturae)* for carrying this public cargo to a final destination, normally the city of Rome or the frontiers.

The whole system was uneconomic, in other words ¡t was burdensome for the State and their citizens; ¡t merely satisfied soldiers' diet because olive-oil allowed them to maintain their ethnic Mediterranean cuisine. Therefore, the whole mechanism aimed to maintain social peace, satisfying the Roman plebs' and soldiers' needs according to the policy of *"panem et circenses "*.

Due to this remarkable Dressel 20 amphora distribution, different from other amphora types in Britain and the Roman Empire as a whole, an explanatory model was created to analyse this circumstance. The model implemented in ARC/INFOI attempts to calculate transport cost efficiency in Roman times using the Roman transport network and some cost coefficients (Carreras, 1994b, 338-354).

Cost coefficients for different means of transport were procured from Diocletian's price Edict (AD 301)[4], which gives the following ratios:

1 sea shipping: 3.4 river boats (downstream): 6.8 river boats (upstream): 43.4 pack animals: 50.72 wagons

Then, the rnodel requires the digitalization of all transport infrastructures (roads, tracks, river and shipping routes) connected amongst them, and imported into ARCNNFO. Once all the maps are imported, the cost coefficient is given to every segment belonging to its corresponding means of transport so the segment length multiplied by this coefficient provides a final cost for travelling along this route. For instance, travelling 10 Km by ship costs 0.97 Kg/ton of wheat, whereas the same distance by wagon was 49.2 Kg/ton of wheat.

Consequently, the simulation model in ARC/INFO allows the user to obtain the cheapest route between two sites in the map by combining different means of transport as well as giving the optimal cost. Furthermore, the simulation provides contour maps with the lowest costs for travelling from one location to the other destinations on the map. Such a conceptual map of transport costs may hint at the possible exchange mechanism employed to trade particular goods such as Baetican olive-oil.

3 ARC/INFO is a Geographic lnformation System (GIS) especially designed for network analysis. The present model was initially created in another system, SPANS, but ¡t was not robust enough for our aims (Carreras, 1994a).

4 Similar ratios can he, worked out from some egyptian papyri gathered by Drexhage (1991, 327-351).

5 In this case two modeis were created. One covers the province of *Britannia* to study the local trade and another includes the Rornan Empire as a whole to study long-distance exchange.

The first contour map created for Roman Britain started at a point in the English Channel and showed clearly the advantages of using water transport for local trade (see figure 2). This contour map actually identifies most amphora distribution in the province, with high densities in the coastal areas, Thames valley and Southern regions (Carreras, 1994b, 176-283)1. The lower the transport costs were, the higher the densities of amphorae that were recorded, following the typical rule of the market system.

However, the minimisation principle of the transport cost contour map does not recognise the Dressel 20 pattern of distribution, which means that Baetican olive-oil was commercialised through other exchange mechanisms. Therefore, the simulation model comes up with other proof about the non-market distribution of the Dressel 20 amphorae.

A second simulation model was generated for the Roman Empire as a whole, and the same method was applied to for each origin of the amphorae recovered *in Britannia.* Figure 3 shows the resulting contour map of transportation costs run from the Guadalquivir valley. lt reveals that the journey was quite expensive for a foodstuff such as olive-oil, making its price so high that ¡t became a kind of luxury in these lands, as happens in later periods in its history (XVth-XVIth century). Only direct State intervention in the olive-oil commerce could explain the amount of olive-oil recorded in Roman Britain, since this trade was almost unprofitable within a market system.

Comparing statistically groups of Dressel 20 stamps from three provinces *(Britannia, Gallia and Germania),* ¡t was realised that there were at least two supplying routes to these provinces, the Atlantic and the Rhone valley (Carreras and Funari, 1998, 41-56). Some stamps were more common in Britain than in Germany and Gallia, two provinces with similar amphorae stamps and supply routes. The differences between Britain and the other two provinces are evident both in the Julio-Claudian period and in the second half of the second century, when some stamps are present in either continental or insular sites.

It looks as if the Baetican workshops were for generations supplying their Dressel 20 amphorae, carrying olive-oil to particular provinces and even regions. Therefore, trading firms or families appeared to control the supply of some routes (Atlantic and Rhone valley) for long periods, perhaps taking advantage of their network of social and economic relationships. Since military supply seems to have been a public affair, this special relationship may have been closer to the

6 Likewise, a simulation run from Colcbester created a contour map close to the Black Burnished 2 distribution, a ware produced in this centre. Moreover, the distribution of Oxfordshire ware was identified by the contour map generated from its production workshop at Oxford (Carreras, 1994a).

7 It was believed that it would probably give scope for transport cost comparison between potential competitors, suppliers of similar goods (i.e. wine, olive-oil) from different regions.

administration and its civil servants. Although there is not much archaeological evidence of this point at the moment, it is an interesting working hypothesis.

With regard to the simulation for the Roman Empire as a whole, the resulting transport cost maps from Baetica were compared to other maps generated from other olive-oil production regions such as Brindisi, Greece, Palestine and Northern Africa. It is worth saying beforehand that the arnphorae from these regions, except Africa (Carreras and Funari, 1998, 64-65), are hardly represented in Britain and Northern Europe. The resulting contour maps from Brindisi, Greece and Palestine demonstrated that they were placed at a great disadvantage in comparison with Baetica and Africa, which had lower transport costs to access Northern markets.

On the contrary, the few finds of North African amphorae cannot he justified according to the transport rates, since they were quite similar to the Baetican ones. So what was the reason for such a pre-eminence of Baetican amphorae in Britain? Again, the public redistributive system seems to he the most plausible explanation. African olive-oil was also part of this system, but it basically supplied the city of Rome as a part of the *annona* like Baetican olive-oil. Therefore, Baetican olive-oil contributed to the supply of the western legions and Rome, whereas African olive-oil was preferentially consumed in the *Urbs.*

OTHER BAETICAN AND LUSITANIAN AMPHORAE IN BRITAIN

Together with the Dressel 20 amphorae, other peninsular vessels have been recovered in the British excavations. Although these containers account for barely more than 5% in weight in any amphora assemblage, they are better represented than other types coming from closer latitudes. The second most common Baetican vessels are the so-called "salazones" amphorae, a series of typologies containing fish-sauces manufactures in a myriad of workshops in the Baetican Southern coast.

Salazones were highly appreciated by the Romans, who were especially keen on the varieties coming from the Black Sea and *Hispania,* for which they paid exorbitant sums (Martial XIII.102; Pliny NH XXXI.43.93). The diverse varieties were known by the names of *garum, liquamen, muria and hallex.* They were carried in the vessels dubbed Dressel 7-1 1, Beltran I, Beltran II A and B.

8 Monte Testaccio records the bulk arrival of African amphorae from the rniddle of the second century onwards (Rodríguez Almeida, 1984; Blázquez et alii, 1994) as well as at the port of Ostia. The inscription of *Sextus lutius Possesor (Hispalis, CIL* 11. 1 180) gives some clues of how the redistributive system worked. He acted as *adiutor* of the *praefectus annonae, Ulpius Saturninus,* collecting Baetican and African olive-oil as well as paying transport fares *(vecturae)* to the *navicularii* employed in their traffic, perhaps the journey from *Hispalis-Gadir* to Rome.

These four amphora types were widespread in Britain in the south-eastern urban centres such as London, south-western sites such as Gloucester or Exeter, and military camps such as Inchtuthill or Newstead (Carreras, 1994b, 261-270). Despite having a low share of the amphora market in the province, salazones arnphorae frorn Baetica were normally the third type in percentage during the Principate (Carreras, 1994b, 498-505).

In addition to Dressel 20 and salazones amphorae, there was a third group of Baetican vessels with high representation in Rornano-British sites, the Haltem 70 vessels. The Haltern 70s were used to carry olives in *defructum or sapa,* or these two wine derivatives on their own (Sealey, 1985, 62-63; Carreras, 1994b, 92-97). Moreover, the typology was produced from approximately 50 BC to 70 AD along the Guadalquivir valley, in a region especially appreciated for its olive groves.

The Haltem 70 was only distributed in Britain in the conquered regions occupied by the Roman armies by the 70s, so there are no finds northwards than York or Chester. Regarding its concentration, high densities of Haltem 70s are recorded chiefly in the southwestern region, in places such as Exeter or Kingsholrn. Its concentration outside the British province is also quite unusual, since Haltern 70 is well represented in the Atlantic coast of Portugal and Spain (Fabiáo, 1989; Naveiro, 1991, 63-69).

The less represented peninsular amphorae in Britain are wine containers frorn *Baetica* (Dressel 2-4 and Dressel 28) and salazones vessels from *Lusitania* (Dressel 14 and Alrnagro 50). The lack of these four types is quite logical regarding the Baetican vessels and the Lusitanian Dressel 14, but striking as far as the lusitanian Alrnagro 50 is concemed. This late fish-sauce vessel was as popular as its Baetican counterparts (Edmonson, 1987; Curtis, 1991) from the late IIIrd century to the Vth AD, according to the archaeological finds in the Western and Central Mediterranean as well as the number of shipwrecks (Parker, 1992).

Furthermore, the comparison of transport cost maps initialised frorn *Baetica* and *Lusitania* after running the simulation model for the Roman Empire as whole, shows that both suppliers had similar advantages in accessing the British markets. In fact, Lusitanian traders were in better position, with lower transport costs, than the rest of producers to sell their commodities in the Atlantic rnarkets.

Therefore, the lack of Almagro 50 amphorae in Britain should be related to juncture problems, which hampered the Atlantic commercial traffic in the Late Empire. On the one hand, the Saxon raiders, who appear for the first tirne in the texts in the second half of the second century AD, impeded the exploitation of trading routes with the continent after this date. The situation worsened when *Postumus* rebelled against *Gallienus* in AD 259 and proclaimed the *Imperium Galliorum,* which remained apart until AD 274. The newly created Ernpire comprised, theoretically, the provinces of Britain, Gaul and Hispania (SHA

Postumus), but there is no evidence of peninsular imports (¡.e. pottery, amphorac) in Britain at this time.

On the other hand the *annona* system, probably responsible for the Dressel 20 imports in the province, seems to have disappeared in *Gallienus* times. The annona transport network appears to have favoured trade in other Bactican commodities such as salazones and Haltern 70, in what looks like a parasitic exchange. Since the system was dismantied in the middle of the third century AD, the Almagro 50 vessels could not benefit from the same advantages as their Baetican predecessors.

The hypothesis of a possible parasitic exchange lies in the detailed analysis of shipwreck cargoes undertaken by Parker (1992). From 54 shipwrecks containing Baetican Beltran 1 amphorae, 19% shared public cargoes travelling together with Dressel 20 amphorae or metal ingots, therefore a cargo loaded in a Baetican port, perhaps *Gadir.* The percentages increase to 30% in the case of Beltran 11 A and 56% for Beltran 11 B. Likewise, Haltem 70 amphorae were part of public cargoes in 36% of known shipwrecks.

According to these rates, the good representation of "salazones" amphorae and Haltem 70s in *Britannia* does not appear exceptional. They could easily have come sharing cargoes with the Dressel 20 along the Atlantie route. Unfortunately, conditions for underwater archaeology in the Atlantic are relatively hard, so few shipwrecks have been studied in detail on the Portuguese coast, NW Spain (Naveiro, 199 1) and the Channel Islands (Guemsey: Little Russell A and B). Most of them contain Baetican or Lusitanian produce as main cargoes.

FINAL COMMENTS

As can he observed from the evidence presented in this paper, *Britannia* was highly dependent on the supply of commodities from the Iberian Peninsula during the Principate. Most amphorae recorded in Romano-British sites come from the provinces of *Lusitania and Baetica,* in such percentages (80-90%) that cannot be compared to other historical periods. The most outstanding example are the Dressel 20 amphorae, with a high representation in al¡ the sites (more than 50%) and especially in the military camps. This remarkable consumption of Baetican olive- -oil seems to be related to public military supply of foodstuffs, which was labelled *annona militaris.*

The two simulation transport models implemented in ARC/INFO demonstrate that Dressel 20 amphorae were not distributed through a market system network, in contrast to other amphora types. Since transport costs did not model the Dressel 20 distribution, the only alternative explanation is that this vessel was part of a

public redistributive system. Therefore the sirnulation modeis support our first hypothesis.

Furtherrnore, the public system may have been indirectly responsible for other peninsular imports in the province, because they probably took advantage of the thriving commercial Atlantie traffic to share ships and infrastructures with them. The significant Presence of other Baetican amphorae ("salazones" and Haltern 70) may be partially explained by this common use of means of transport.

REFERENCES

BLÁZQUEZ, J. M.; J. REMESAL and E. RODRIGUEZ ALMEIDA (1994) - *Excavaciones en el Monte Testaccio. Campaña 1989.* Madrid.

CALLENDER, M. H. (1948) - "Corbridge amphora stamps". AA (4) 27, pp. 264-286.

CALLENDER, M, H. (1965) - *Roman amphorae, with an index of stamps.* OxfOfd.

CARRERAS, C. (1994a) - *Una reconstrucción del comercio de cerámicas: la red de transportes en Britannia.* Barcelona.

CARRERAS, C. (1994b) - *A macroeconomic and spatial analysis of long-distance exchange.* Unpublished thesis, Southampton University.

CARRERAS, C. and P. P. A. FUNARI (1998) - *Britannia y el Mediterráneo. Estudios sobre el abastecimiento de aceite bélico y africano en Britannia.* Col. instrumento 5.Barcelona.

CURTIS, R. 1. (1991) - *Garum and salsamenta. Leiden.*

DREXHAGE, H. J. (1991) - *Preise, mietenlpachten, kosten und Ioihne im rámischen Ágypten bis zurn regierung santritt Diokletians.* St. Katherinen.

EDMONSON, J. C. (Igg7) - *Two industrias in Roman Lusitania, mining and garum production.* BAR Int. Ser. 362. Oxford.

FABIÁO, C. (1989) - *sobre as ánforas do acampamento romano de Umba do Canho* (Arganil). UNIARQ. Lisboa.

FUNARI, P. P. A. (1996) - *Dressel 20 inscriptions from Britain and the consumption of spanish olive-oil.* BAR Int. Ser.. 142. oxford. *NW Peninsular.* Monografla Museo

NAVEIRO, J. L. (1991) - *El comercio antiguo en el* Arqueológico nº 51 La Coruña.

PARKER, A. J. (1992) - *Ancient shipwrecks of the Mediterranean and Roman provinces.* BAR Int. Ser. 580. Oxford.

PEACOCK, D. P. S. and D. F. WILLIAMS (1986) - *Amphorae and the Roman economy.* London.

REMESAL, J. (1986) - *La annona militaris Y la exportación del aceite bélico en Germania.* Madrid.

REMESAL, J. (1997) - *Heeresversorgung und die wirtschaftlichen Beziehungen zwischen der Baetica und Germanien.* Stuttgart.

RODRIGUEZ ALMEIDA, E. (1984) - *11 Monte Testaccio. Roma.*

SEALEY, P. R. (1985) - *Amphoras from the 1970 excavations at Colchester Sheepen.* BAR Brit. Ser. 142. Oxford.

Fig. 1 – Distribution of Dressel 20 amphorae (densities g/m²).

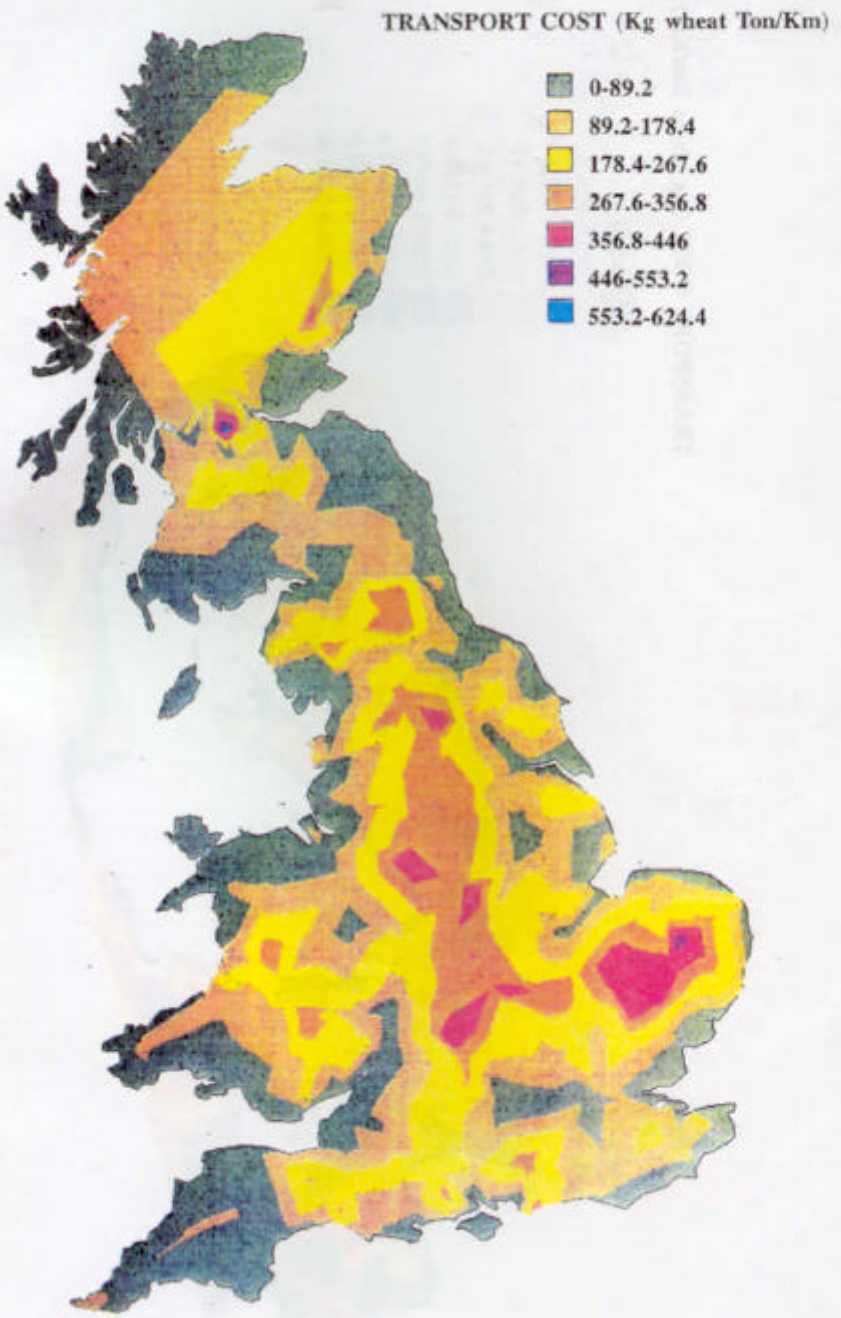

Fig. 2 – Transport costs in a market system from a South-western origin (ARC/INFO).

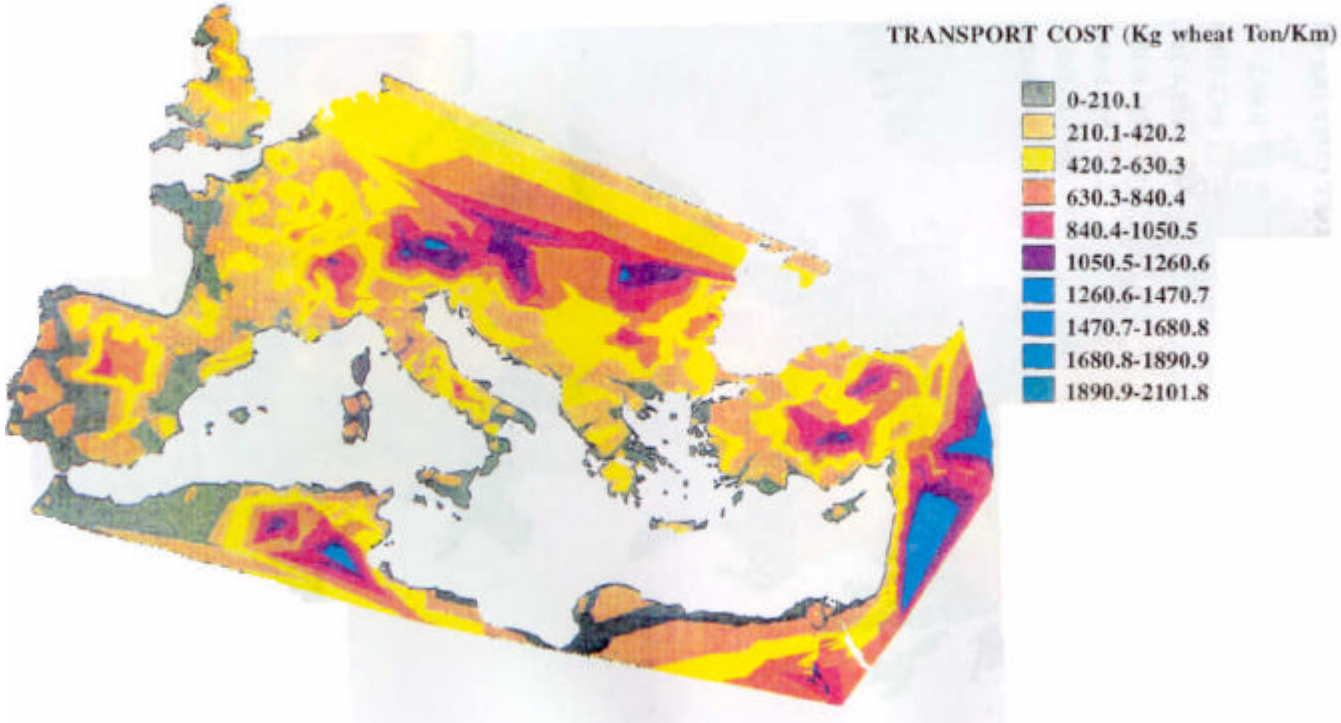

Fig. 3 – Transport costs in a market system from Baetica (ARC/INFO).