

SHIPWRECKS AND ANCIENT TRADE IN THE MEDITERRANEAN

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Study of the ancient world, especially of the Roman Empire, has recently featured an increased interest in the economy, and specifically, trade. A number of factors are responsible for this -- they include, on the one hand, the influence of Marxism, in considering economic and social (as opposed to political) factors in historical development (cf. Carandini 1968; Hopkins 1983), and, on the other hand, the increased information which has resulted from a greater quantity and quality of archaeological data (cf. Peacock 1977; Lloyd 1977). Increasing subtlety has, however, brought increasing complexity of interpretation and some disappointment. Archaeological techniques now enable us, in some respects anyway, to achieve a 'holistic vision' of the past, but of course full-scale reconstruction of ancient societies is physically and economically impossible. Analytical techniques are increasingly powerful, but their cost in academic time renders reliability of sampling crucial, and in fact it may be impossible to match available analysis time with usefulness of information obtained. Moreover, the limits of inference from archaeological identifications may be so low as to make such inference banal (e.g. almost any Roman site produces some imported material, and is thus in some sense evidence for vigorous commerce). Problems of skew, of imperfect recovery, and of the unequal distribution of research, probably render the establishment of 'archaeological statistics' impossible.

Insights, or at least key samples, may, however, be found in special contexts, three types of which spring to mind:

1. burials -- drawback: conscious selection of material for deposition;
2. cataclysms (e.g. Pompeii in AD 79) -- drawbacks: salvage (whether contemporary or later) may be impossible to assess and such sites are very few in number;
3. wrecked cargoes -- drawback: many problems of interpretation, etc.

The nature and advantages of shipwrecks as archaeological sites have been reviewed by Muckleroy (1978; 1980), by Gianfrotta and Pomey (1981) and by the author (Parker 1979; 1980). Problems include poor preservation of the original deposit, unequal distribution of reported sites, inadequate recording and study of the material. Means for overcoming some of these problems do exist. For example, the large number of sites now known is in itself an advantage. At the time of writing, 821 shipwrecks (datable to before AD 1500) have been reported from the Mediterranean and the Black Sea. This repertoire of sites, the main

focus of the author's research, is the basis for the discussion here. The size of the body of information enables its uneven spread to be smoothed by means of generalising statistics, and the comparison of sets of data. As the body of information increases, so trends become firmer by the year. This article reviews some of the patterns of the data provided by the ancient shipwrecks of the Mediterranean, and considers prospects for future research.

History of Shipwreck Research

Only very few ancient ships, whether they lay under the open sea, in lakes, or on land, had been studied prior to the post World War II spread of aqualung diving. Since the early 1950s, however, there has been a very rapid growth in information -- over 800 sites in 30 years. Imagine if, for example, Bronze Age barrows or Romano-British villas had hardly been known prior to the mid 20th century! It is scarcely surprising that the practical and intellectual tools for handling this resource are still inadequate. Thus, even well-informed archaeologists fail to understand the limitations and advantages of the resource: for example, Manacorda (1981) who confuses isolated and contaminated finds with shipwrecks proper. Historians, too, are uncertain what standing to award this kind of evidence. As sites, shipwrecks have limitations. For instance, the level of association of material varies from site to site, and has to be sympathetically considered within a site (Parker 1981). On the other hand, there are advantages. Many classes of material are preserved, or preserved in a useful context, only in wrecks (Figure 1).

Preservation and Information

Ships were lost or just abandoned in a great variety of circumstances and locations -- from silted-up rivers, lagoons or harbours, to the deepest part of the open sea. Many, of course, fell foul of headlands, reefs and sandbars, while probably a substantial number (perhaps 10% of all known sites) were deliberately run-ashore in the hope of saving the crew, passengers, and as much as possible of the cargo. Piracy too has reasonably been suggested as a cause for a number of wrecks. At all events, wreck sites have the advantage (so far as one can tell) of being for the most part due to unintentional factors. Unless some other factor can be found, one can take them as a representative sample of the ships which actually sailed.

Of wrecks at sea, the greater number (29%) lie in shallow water; they tend to be broken up, and have often been looted. Such sites can help with the statistics of trade, but on the whole are less satisfactory than well-preserved sites, where the ship's hull and contents remain in place, and are protected from contamination by encrustation or sediment. The search for well-preserved sites must go on, and can be shown to bring rewards (Frey 1982). However, much information already gathered has never been made public -- over 25% of all sites have been only summarily reported ("A Roman wreck off..."). Even where more specific information is available, either the site or the finds have

been all too sketchily published; and a mere handful even of well-preserved, properly excavated sites have so far been reported in detail. There is an urgent need, not only to find new sites and investigate known ones before they are destroyed, but also to collect material and information from the various divers who raised it, even unsystematically, in former years (cf. Bound and Vallintine 1983)

Number of Shipwrecks

Although shipwrecks have been found in many parts of the Mediterranean, their reported distribution is decidedly uneven (Figure 3). If one degree of Latitude and Longitude is considered, for present purposes, as a square, the frequency of shipwrecks per square can be plotted and analysed. Roughly 420 squares contain a greater or lesser extent of coastline, or area of sea. Of these, only 137 (33%) are known to contain a wreck site. Many coastal areas, and most of the deep sea, show no sites at all. On the other hand, of the 137 populated squares, 49 (36%) have only one reported site; whereas, in just two squares (both in southern France) there are no fewer than 109 shipwrecks (13% of all known sites). This varied distribution is due, partly to sea conditions and the types of coastline which are more favourable to diving, partly to the level of archaeological research and education of divers, and partly to the relative freedom from restrictions on diving. Nonetheless, there are indeed areas (e.g. the Strait of Bonifacio between Corsica and Sardinia) where the number of shipwrecks reflects both the dangers and the volume of ancient navigation.

Date of Shipwrecks

Many shipwreck sites can only be approximately dated, especially where only a summary description (e.g. 'Hellenistic', 'Late Roman') is given. The frequency chart (Figure 4) should, therefore, be treated with an element of caution. Nonetheless, the general picture is clear: the most intense period of losses (and, by implication, of voyages) was in the Hellenistic (Late Republican) and Early Roman Imperial periods. The Late Roman and Byzantine periods are relatively well represented, whereas there is a disappointing lack of Bronze Age and Early Iron Age finds, and, perhaps most surprising of all, an effectively complete absence of shipwrecks from the Colonising period of Greece. This inequality is not easy to explain away; the number and variety of cargoes of other periods now known leave little doubt that, if 7th and 6th century BC wrecks really exist in substantial numbers, some would have been found. However, the ineffectiveness of shipwreck investigations in Greece to date leaves scope for modification of this view in future.

Comparison of the Sets of Data

The number of known shipwreck sites is now sufficiently large to permit some comparison between areas, that is to say, between sets of data. Six areas have been selected (Figure 5), and the datable shipwrecks from each area have been assigned to one of eight periods. The

proportion of shipwrecks by period is shown graphically in Figure 6. The most important feature is the great variation between areas: no two areas show exactly similar profiles throughout their history. For example, south-east Sicily shares with the eastern Mediterranean a revival of traffic in the Byzantine period, but the Bonifacio Strait has no recorded wrecks at that time. To press such data into historical constructs would be wrong, at any rate with the present level of information. However, especially if characteristics other than date are considered, variation in the pattern of ship losses across the Mediterranean region is clearly shown to be worth study and explanation.

Cargoes

For statistical purposes, goods carried as cargo by ancient ships can be divided into six types: amphoras, metal, pottery, stone, tiles/pipes, and other cargo (Figure 7). Where only one type of cargo is known to have been found at a site, three times out of four (76%) it is amphoras. This imbalance is partly due to insufficient exploration, for, where a wreck is thoroughly excavated, cargo of more than one type tends to be found. Where two types of cargo are reported from a site, the chance of amphoras being one of those types is only two in five, and this possibility is less, the greater the number of cargo-types that is reported. The preponderance of amphoras must therefore be qualified. However, it may be that amphora cargoes are the easiest type to discover on the seabed; they are also a very characteristic type of object and likely to be identified as of historical interest even by laymen. Conversely, (as F. Foerster has suggested) cargoes of tiles may have been discovered more rarely because they are more dense than amphoras, so that tile ships were loaded up to a lower level, and the top of the cargo is less likely to be seen above seabed sediment. Such insights are wanting in the case of the almost complete absence from the record of corn or timber, both of which commodities were certainly transported by ship in antiquity; and this is a puzzle which at present defies solution.

Make-up of Cargoes

Even at the height of maritime trade, when the large quantities of Italian wine or Spanish oil shipped abroad suggest the development of specialised traffic, vessels were often laden with a variety of goods, and, within the chief cargo, a variety of producers and production areas could be represented. Three examples may be cited from the hundreds available.

Comacchio. A 25 metre long ship of stitched construction, which sank c. 15-10 BC in a now silted channel of the Po delta, was excavated in 1981 by Fede Berti (Ruscito 1982). The main cargo was a large load of shingle. At either end were amphoras, of three forms -- Apulian, Istrian and Rhodian (or an imitation thereof); 99 lead ingots, all with the same inscription, probably Spanish; a consignment of coarse pottery; another of bronze vessels (pots, pans, ladles, etc.); another of wooden

objects (including bowls, plates and boxes); and six tiny votive temple models made of tin.

Madrague de Giens. A large sea-going ship, which sank in the open sea near Hyeres c. 60-40 BC, was excavated over several seasons by A. Tchernia and P. Pomey (Tchernia et al. 1978; English summary in Tchernia 1978). She was laden with 400 tons of cargo, mostly amphoras (6000-7000 in number) from Latium. There were also at least 300 pieces of black-gloss pottery, much of it thought to be not from Italy but from some other western area of origin; over 200 coarse-ware pots, perhaps of Italian origin, although paralleled from finds in Gaul; and an unknown quantity of pine cones.

Saint Gervais C. The remains of a ship which sank in c. AD 150 in the ancient harbour of Fossae Marianae, near the mouth of the Rhône, were found in 4 metres of water, and have been excavated by the Direction des Recherches Archeologiques Sous-Marines (Liou 1980; Lequément 1981, 130-131). Only broken amphoras were found, so the usable cargo will have been salvaged in antiquity (and it could have included pottery, etc., or other goods such as metal ingots). There were three kinds of amphoras: Gallic amphoras (Dressel 30), perhaps from the Narbonne area; Baetican amphoras of two forms: Dressel 20 amphoras containing olive oil, and baggy Beltrán 2B amphoras, contents undetermined. A full report on this site is not available, so one cannot speculate how these different consignments reached Fossae. The Dressel 20 amphoras retain painted inscriptions which show that they were shipped by several merchants (though all or some might have been freedmen in the service of a single household), and that each merchant's consignment included oil from more than one estate (though, strictly speaking, this is known for only one of them, Antonius Epaphroditus).

From these three examples, a tiny selection out of the available material, three points emerge:

1. a good deal of transshipment and harbourside dealing is implied, in order to make up cargoes -- at, for example, Seville, Narbonne or Ostia. The flow of goods which is evidenced by, for example, the Monte Testaccio in the 2nd century AD actually took place by highly varied and complicated means;

2. it looks as if, even at the height of maritime commerce, compound rather than bulk cargoes were in fact normal. It is hardly surprising, then, that wrecks of only pottery or lamps are almost unknown;

3. the full picture is obtainable only by complete excavation and reporting of an adequately preserved site. Such sites are in a minority, emphasising the need to exploit the resource more intensively.

Puzzles and Solutions

1. The relative lack of pottery cargoes has been discussed (Fulford 1984, 257). The solution to the question must be that compound

cargoes were in fact the rule, and that in such cargoes pottery (if present) is less likely to be noticed during the first inspection of the site.

2. The lack of cargoes which could represent return traffic to, for example, Spain from Italy in the early Empire. The solution must be linked with that of puzzle number 1; merchants bought and sold what they could at Puteoli or Ostia, including imported goods, and conveyed it either speculatively or to order.

3. The lack of certain commodities (e.g. Tripolitanian olive oil amphoras) in shipwrecks, even though they are found in numbers away from their area of production. The explanation is probably to be found in the absence of research in certain areas of the Mediterranean.

The Present State of Knowledge

Despite the similarities and groupings, some of which have been demonstrated above, each site has its own rich interest; no two are exactly similar. To convey this richness -- to unfold, as it were, a tapestry of human interest, frozen at instants of time -- is impossible within the limits of this article. New finds, and new work on existing finds, continue not only to extend the range of individual insights, but also to enhance our understanding of certain topics. Among these are: early technology and prehistoric trade; special conditions and circumstances of preservation; the wine trade; ship construction and life on board; early Imperial trade and economy in general; compound cargoes and unexpected associations; the Roman provinces; the post-Roman period. These and other topics will be reviewed more fully by the author elsewhere (Parker n.d.).

Prospects for Future Research

Exploration should be extended in other seas. In the Atlantic, the Baltic and the mouth of the Rhine, survey is hampered by poor visibility and coastal changes, but the potential results are important, bearing on the extent to which maritime, as opposed to overland, routes were responsible for contact between the classical world and the more distant barbarians. In the Red Sea and the Indian Ocean, exploration is made difficult by coral growth, coastal changes and ocean swell, but the sources suggest that many large ships sailed these areas during the Hellenistic and Roman periods; not to mention the broader interest, for cultural and technological history, of possible finds of ancient Arabian and Indian vessels.

There is much to explore in the Mediterranean, as Figure 3 shows. There is no information at all from Albania or much of Morocco, Algeria, Tunisia, Lybia, etc., and what we have from the Aegean, the Black Sea and the Syrian coast is very limited. The largest group of sites tend to be either in popular diving areas, or in areas such as south-west Turkey and eastern Sicily where there has been extensive exploration, or off the shores of countries like Israel and France where a national organisation is responsible for protecting, investigating and reporting

on wrecks. Even in these areas, new finds are being made. At Arenella, for example, near Syracuse in eastern Sicily, a well-explored area, a medieval shipwreck, said to be full of weapons and metal utensils, was recently reported.

Exploration is also possible, and desirable, in the deep sea. An increasing range of equipment -- submersibles and remotely piloted vehicles, with various forms of remote-sensing, television and photography -- is available, and in use by commercial operators (Barbieri and Purpura 1977; Speiss and Orzech 1981). Deep diving techniques also exist, though the extreme cost and difficulty of using gas mixtures and skilled manpower suggest that robots with powers of sight and touch may be the more likely archaeological solution in the end. The recovery of preliminary information about chance finds in deep water, and the co-ordination of effort, constitute a major problem which archaeologists have made almost no progress in solving (Goodman 1979).

Silted sites are perhaps the most difficult to find but, as has been shown at the site of Comacchio cited above, they have very great potential, especially for the preservation of ships. They also perhaps offer the best chance of discovering more prehistoric sites.

To follow up old finds, already mentioned, is possibly the most urgent task, for it is essential to gather up details from those who found, and reported only briefly on, shipwrecks in the early years of aqualung diving before contact is lost or the older divers die. Much material exists which is still unstudied, or unpublished, and can, of course, reveal information at a fraction of the cost of excavation. Old sites, too, can be re-examined, especially with the hope of finding material specific to date or origin.

Conclusion

The main contribution of shipwreck archaeology has been to the historical period, and its limitations are much the same as those of any archaeological evidence from this period. The bulk of the material, taken at a generalising level, can do little more than bear on broad hypotheses or draw attention to questions which will be hard to answer positively. The problem is not to discern and define patterning, but to make it interact with other patterns of the economy and culture process. Much scope exists to improve the quality of the resource, and it is from the rich variety and complexity of sites, rather than their taxonomic similarities, that an enhanced understanding is likely to proceed.

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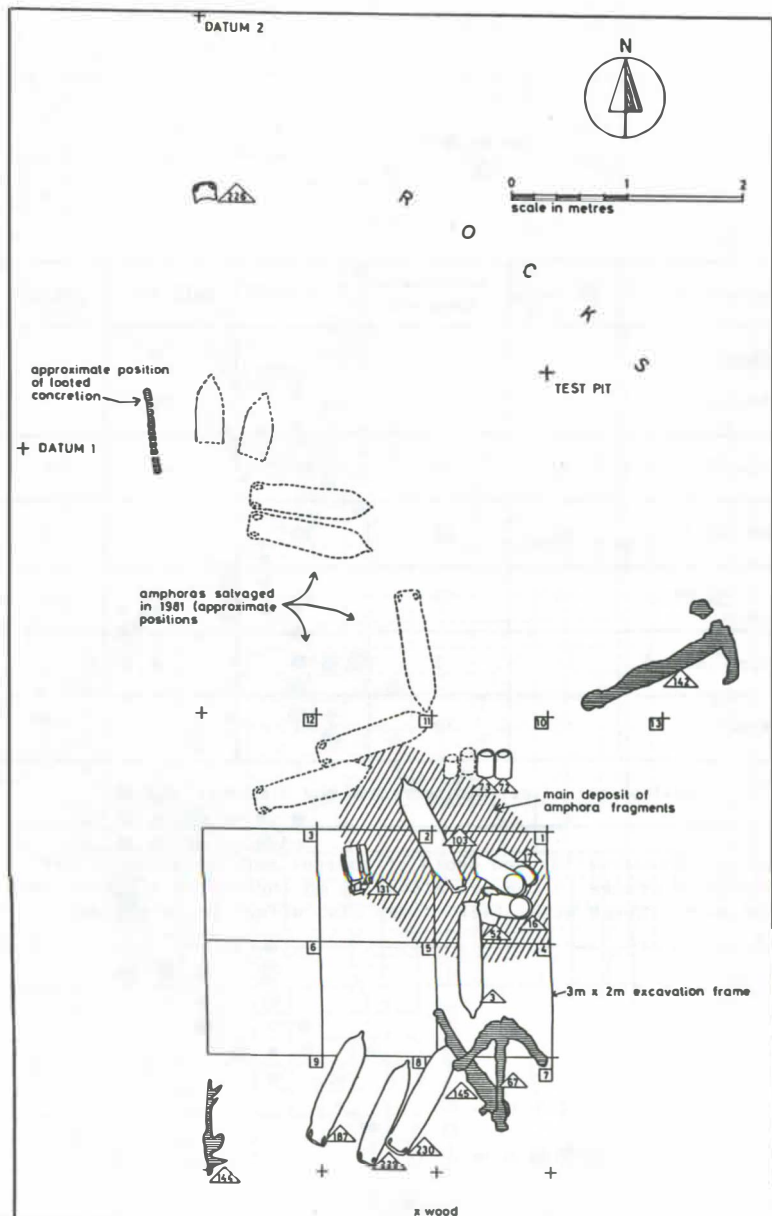


Figure 1: A Roman wreck of the 4th century AD at Randello, Sicily.

Preservation:	Perfect	Relatively Coherent	Scattered	Hull Only	Unknown	Total
<u>Depth:</u>						
Silted	1	0	0	29	1	31
Shallow (0-15 m)	19	60	105	17	40	241
Medium (15-30 m)	27	29	26	1	19	102
Deep (30-60 m)	64	39	14	0	38	155
Very Deep (60+ m)	11	2	0	0	13	26
Unknown	15	12	11	1	227	266
Total of all sites (Mediterranean and Black Sea):						821

Figure 2: Preservation and depth of ancient Mediterranean wrecks. The depth of wrecks in the sea stands as an indication of conditions at the site, though other factors may also affect preservation.

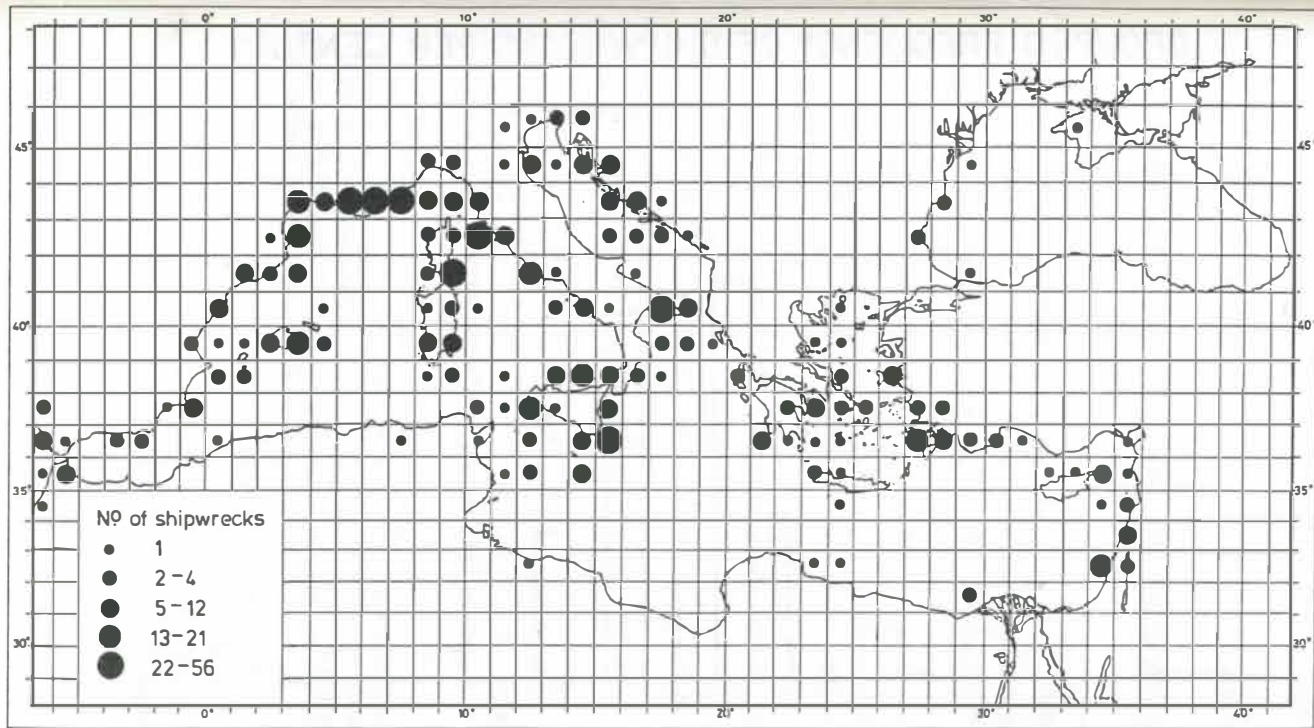


Figure 3: Location of ancient Mediterranean shipwrecks. The number of sites in each 'square' of one degree latitude and longitude is counted; the frequency of sites per 'square' is shown by symbols of proportional size.

GROUPED FREQUENCY OF SHIPWRECKS PER CENTURY

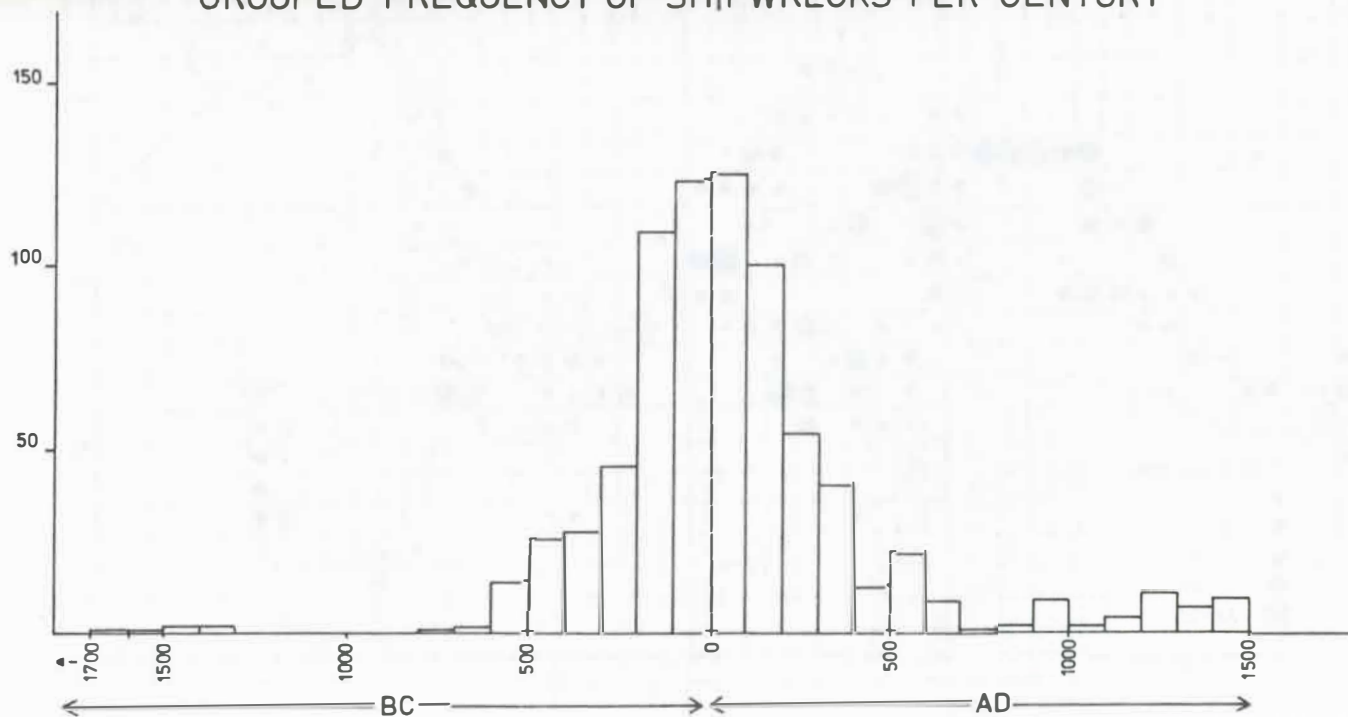


Figure 4: The date of Mediterranean shipwrecks. Each site is given a range of dates between which it can be dated; the means of these ranges are plotted in 100-year groups. The great number of Hellenistic and early Roman Imperial wrecks is notable, as is the scarcity of Medieval sites. Amid-3rd millennium BC site at Dhokos, Greece is omitted.

SELECTED GROUPS OF SHIPWRECKS

LAT/LONG	AREA	No *	%								
			← BC →				← AD →				
			PRE 300	300 150	150 0	0 150	150 300	300 450	450 650	650 1500	
36/27-31 + 37/27-8	S.W. TURKEY	39	— — —	30	9	12	12	3	9	15	9
32/34-5 + 33/35	ISRAEL	30	- - - -	20	13	17	10	13	10	7	10
36-7 15	S.E. SICILY	33	— — —	16	6	12	3	25	9	25	3
42/10	TUSCAN IS.	43	- - - -	10	10	19	38	14	2	0	7
43/6	C.S. FRANCE	56	6	11	39	34	4	13	0	4
41/9	BONIFACIO	37	— — —	0	11	8	57	5	19	0	0

* INCLUDES UNDATED (ANCIENT) WRECKS

Figure 5: The dates of wrecks in six selected areas. Six areas with roughly equal numbers of recorded sites (though only roughly equal in extent) are compared; the wrecks known from each area are divided into eight periods, and the number of wrecks in each period is shown as a percentage of that areas' dated wrecks.

SELECTED GROUPS OF SHIPWRECKS ~ PERIOD %

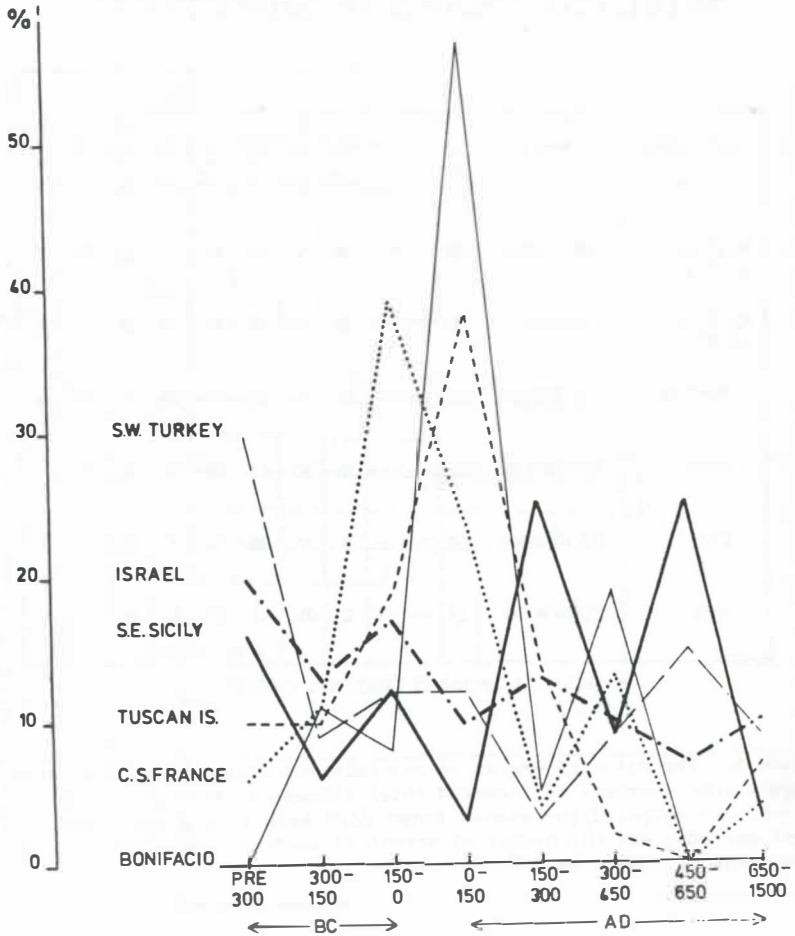


Figure 6: Graph showing the dates of wrecks in selected areas.

FREQUENCY OF TYPES OF CARGO (%)

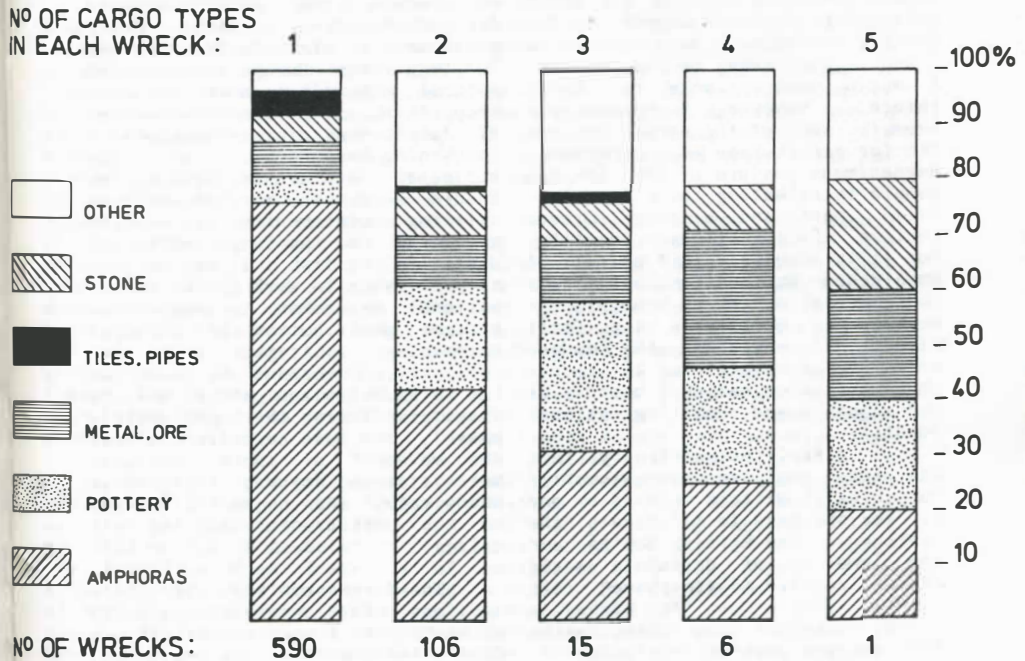


Figure 7: Cargoes reported from Mediterranean shipwrecks. The first column shows that amphoras are by far the most common cargo-type. The successive columns show that the greater the number of different cargo-types reported, the less the imbalance towards amphoras.