

Ancient Shipwrecks of the  
Mediterranean and the  
Roman Provinces

A. J. Parker

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*Ancient Shipwrecks of the Mediterranean and the Roman Provinces*

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## Foreword

The ancient world made extensive use of water transport; in the nature of things, this resulted in the loss of many vessels, which in recent decades have become easily accessible thanks to compressed-air diving. These lost ships constitute a remarkable resource for the social, economic and technical history of antiquity, but knowledge of them, often unpublished, has been hard to come by for historians and others who would like to make use of the statistics or the insights they offer. The primary purpose of this book is, therefore, to gather together in a standardized form a catalogue raisonné of the shipwrecks of the Mediterranean region which date before AD 1500, together with Roman ships and boats from outside the region, so that the quality of our accumulated information can be judged, and the inferences to be drawn from the material evaluated. The Catalogue is concerned essentially with sea-going ships of the Graeco-Roman world, and so Egyptian boats and pre-Roman boats of the barbarian regions have been omitted.

No complete, authorized list of shipwrecks will ever be possible: the pace of discovery (which includes the clarification or confirmation of vague reports) is too fast, the means of dissemination of correct information too diffuse. Several states now have national or regional archives of underwater sites, but these are not published in detail, and in some cases are kept secret. The present Catalogue was drawn up in January, 1992; already, however, new sites are being reported and a supplement will soon be required. Nonetheless, the body of material here gathered together, comprising 1,259 sites in all, or 1,189 in the Mediterranean region alone, represents a considerable sample, which can provide a basis for historical inference.

It is exhilarating to discover antiquities under water. The risks and hardships of diving are easily counterbalanced by the excitement and beauty of the underwater world, and to share a moment of past time through the material remains left on the seabed by sailors or passengers long ago adds a very special dimension to that experience. I hope that some of this feeling, which I have been privileged to enjoy for more than twenty years, can be shared even in small part by those who study the pages that follow.

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Many academic libraries, as far afield as Dublin and Jerusalem, have provided published material, much of it obscure; special thanks are due to the staff of the libraries of the Institute of Archaeology (University of London) and the University of Bristol.

Research for my DPhil thesis (1973), which included an early version of this Catalogue, was in part supported by Oxford University and Corpus Christi College, Oxford.

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Bristol, March 1992

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## CHAPTER 1

### Ancient Navigation and Wreck

The Mediterranean and the Black Sea are, for the most part, effectively tideless, and enjoy good visibility and calm seas for much of the summer. They appear inviting, but in fact are full of difficulties and hazards for ships such as those of the early navigators. There are low, sandy coasts, which lack both navigation marks and natural havens; there are also many rocky, mountainous coasts which may cause delays or dangers to ships held by contrary winds, or overwhelmed by squalls. Even the relatively gentle currents of the Mediterranean can, in combination with other hazards, place a sailing ship in danger.

No one knows when the first navigation took place in the Middle East or Europe. Perhaps Palaeolithic hunters developed floats or rafts to help them cross rivers, hunt water-birds and animals, or reach sources of stone for tools; however, the earliest boats known are dugouts (logboats) from the Mesolithic of northern Europe and Scandinavia, and it was a further 3,000 years before the oldest surviving vessel, the plank-built river-ship of Cheops, was constructed in Egypt (Casson, 1971; Johnstone, 1988). Nonetheless, it appears that men were voyaging across the Aegean as early as the tenth millennium BC (according to Perlès, 1979), for, in the Franchthi Cave in the Peloponnese, obsidian (probably, though not definitely, from Melos) is found in occupation levels even at that date, implying some sort of sea crossing of the relatively short stretches of open water between the mainland and the island of Melos; however, in the Upper Mesolithic period (c. 7000-6000 BC) new types of tools made of Melian obsidian came into use, and at the same time the inhabitants of the cave began to consume large quantities of tunny fish (Jacobsen, 1981). The fish were adult tunny, measuring up to 2½ m long and 200 Kg in weight; such fish must have been caught, in antiquity as today, in the northern and north-western parts of the Aegean, implying extensive seaborne fishing expeditions, and the beginning of maritime exchange and even settlement, by the people of the Franchthi Cave (Van Andel & Runnels, 1988). We may also infer from the probable date of the earliest human occupation of Sardinia that in the western Mediterranean, too, the considerable distances which had to be crossed to reach the islands of that region were no longer a barrier by the 6th millennium BC (Camps, 1985; Phillips, 1986).

Of the ships, boats and rafts of these early seafarers we know very little. Not until the mid third millennium BC do we find any example of an actual shipwreck (at **Dhokós**),\* and it seems that at that site no substantial traces of the hull are preserved, so that the earliest actual seagoing ship so far discovered is the 14th century BC Late Bronze Age wreck of **Ulu Burun**. However, during the classical and Byzantine periods the number of ships lost in the Mediterranean totals over a thousand, most of them Roman. This substantial body of archaeological material, with its potential insights into ancient social and economic history and the history of technology, is the subject of this book.

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\* Names printed in boldface are of wreck sites; details will be found in the Catalogue of Wrecks, below.

## Shipwrecks as an archaeological resource

The recovery of goods from sunken ships was certainly a normal part of ancient life, probably from the earliest days of navigation. Apart from the military uses of attack on moored ships or defended harbours by swimmers and divers, coral, sponge and shellfish gathering and the recovery of goods from wrecks must have been practised from early times (Gianfrotta & Pomey, 1981: 18-39). Salvage divers (urinatores) were among the guilds of the Roman port of Ostia, and their work has been discerned even at 25 m deep on the 1st century BC wreck of La **Madrague de Giens** off the southern tip of Gaul (Tchernia, 1982), and in 3rd century BC contexts on the Balearic island of Cabrera (Colls, 1987: 8). Likewise, in medieval and later times, material was recovered, whether by chance or by design, from ancient wrecks, especially if they were abandoned in marshes or in well-defined locations such as Lake **Nemi** (Italy), where the great Roman pleasure-galleys were located and salvaged from the 15th century on, culminating in their final drainage and raising in 1928-32. The adoption of diving equipment enabled more effective salvage, for example of **Antikythera** wreck A in 1900-1 or **Mahdia** in 1908-13; the major change in access to ancient wrecks, however, came with the introduction of aqualung (SCUBA) apparatus in the 1940s (Bass, 1966; Gianfrotta & Pomey, 1981). As the sporting use of the aqualung spread, at first especially in southern France, hundreds of amphoras and other finds began to be brought ashore, sometimes to public museums, often to private collections, by both local and visiting divers. Museum curators and academic archaeologists, while they were aware of the potential interest of such objects, were slow to take effective action to understand or safeguard the sites from which they came. The speed of growth of the archaeology of underwater sites has in itself given rise to difficulty in assimilating and understanding the implications of the material. The expansion of available information, with over 900 sites found in less than 40 years, is rivalled only by the discovery of sites from the air (**Figure 1**). It is scarcely surprising that the practical and intellectual tools needed to handle the resource are still inadequate. Even well-informed archaeologists fail to understand the limitations and advantages of underwater sites, and historians are uncertain what standing to award this new kind of evidence. To make ancient shipwrecks available to students of antiquity in a reasoned, critical, standardized form is the principal aim of the present book.

The awareness of the resources of the underwater world was not, of course, limited to aqualung users. Already Merlin (1912) had realised the importance of seabed finds for recovery of art treasures; the intrinsic interest and value of occasional finds of statuary meant that such finds, even if they were completely unassociated or dishonestly provenanced, were still given serious attention. The importance for the study of ancient trade and history of even the relatively uncontrolled finds made by fishermen was well summarized by Barag (1963). Fishermen's finds were also recorded and interpreted by N. Lamboglia (1952c) and led him to undertake the 'recovery' of part of the cargo of the **Albenga** wreck with a salvage vessel, the Artiglio, in 1950 (Pallarés, 1985d). Archaeologists were slow to come to grips with the nature of shipwreck sites, and the problems of recording and excavation which they involved. Although F. Benoit was already reporting wrecks as sites or groups of material in the 1950s, his interest was more in the collections of finds than in the actual dynamics of the underwater site; this led to uncertainty of interpretation in his reports,

for which see Parker (1981b) and Long (1987). The first real excavation in a true archaeological sense was at Albenga, though this had special difficulties on site and limited objectives (Lamboglia, 1952a), and it was not till the excavation of the **Titan** wreck by P. Tailliez in 1957 that a fully active diver brought archaeological principles to bear on every aspect of a wreck site (see his remarks, 1965; an appreciation of his work by Throckmorton, 1987).

### **The underwater heritage**

To be wrecked was a relatively common occurrence in antiquity, as is evident from the literary references to the fear of such a fate. Some coasts were especially dangerous, by reason of either the natural conditions or the activities of the locals (Stronk, 1986). The Mediterranean, a delight on which to sail in high summer, can become uncomfortable and dangerous without notice, especially in autumn or winter. Even our present, incomplete information shows that the loss of ships per year in classical antiquity was considerably greater than that recorded by the Dutch East India Company in the 17th-18th centuries, and the true figure must be several times higher. The 1,200 sites collected in this Catalogue are therefore only a sample of the many thousands of ships which must have put to sea in ancient times, but nonetheless it is a sample which, while being biased and incomplete, contains a good deal of information about ancient trade and technology.

A shipwreck is a special type of archaeological site. Most excavations on land investigate settlements, where the archaeologist removes a series of successive, superimposed layers, many of which have accumulated over a long period of time. Rubbish and discarded objects still lie where they fell, others have been removed. By contrast, a shipwreck encapsulates a group of objects as they were at a single moment in past time. It is thus a closed or associated group; such groups occur also in burials or in votive or other sacrificial deposits, but in those cases the selection of objects is self-conscious - their end is intended. With ships, as with groups of objects found in buildings overwhelmed by an earthquake or a volcanic eruption, the material found on board represents a glimpse of normal, day-to-day affairs.

This is not to say that the material found in ancient shipwrecks is the normal or regular stuff of archaeology. Organic material is often preserved (as it is on submerged settlement sites). Some nautical objects, such as ship's stores or sounding-leads, simply do not occur on land sites; other objects, such as tools, are rarely found in associated groups. Most important, the cargo of the ship constitutes a sample of trade goods on their way from one port to another, and so provides a unique kind of evidence about ancient trade. Ancient authors' descriptions or references to commerce are hard to use for historical purposes; archaeological material has other limitations, but provides an invaluable corrective.

### **Sources of information and its quality**

References to shipwrecks have to be gathered from a great variety of sources, ranging from mere gossip through to specialized archaeological reports. Often the location and other details of the site are concealed, whether to prevent or to disguise looting. Very frequently preliminary notices are not succeeded by more detailed reports, even when these are



promised. This is, of course, due in large measure to the alienation of many professionals from underwater archaeology, and the fact that most discoveries are made by divers who lack the background or the means to identify and interpret what they have found. This Catalogue tries to even out such inequalities and shortcomings by drawing on every possible source of information, looking critically at the dates and identifications proposed, and presenting a reasoned summary of the site in a standardized form. This has never been attempted before.

### **Problems of interpretation and listing**

Given the difficulties of categorising sites, and the varied reliability of reports, it can readily be understood that to establish a 'definitive' list of ancient shipwrecks is an impossible task. In the present Catalogue, I have excluded some items or groups of items which might in fact represent a wreck (c.f. **Livorno** or **Karantinnaya Bay**), while in other cases (c.f. **Formentera** or **Marzamemi K**) I have included sites as wrecks which others might well exclude. Often I have chosen to respect the verdict of experienced divers who have seen many other ancient wreck sites, and who, for example, have considered **Dhokós** or **Riace** to be wrecks despite the scepticism of other archaeologists. In defence of this approach, it can be said that the normal tendency over the years is for sites to be confirmed as wrecks, rather than to be discredited, as investigation continues and comparative knowledge grows.

### **Classes of wreck site**

Ships were wrecked (or just abandoned) in a great variety of circumstances (see Table 1). The circumstances range from silted-up rivers, lagoons or harbours to the deepest parts of the open sea. Many ships, of course, fell foul of headlands, reefs and sand-bars, while probably a substantial number (perhaps 1 in 10 of all known sites ?) were deliberately run ashore in the hope of saving the passengers and crew and some at least of the cargo. Accidental fire and piracy, too, have been suggested for several sites. At all events, wrecks were (so far as one can tell) for the most part unselfconscious; thus one can usually take them as a representative sample of the ships which actually sailed.

TABLE 1

## Depth and Condition

Condition:	Perfect	Coherent	Scattered	Hull only	Unknown	Total
<b>Depth:</b>						
Silted/dry land	3	3	1	34	7	48
Shallow (0-15 m)	29	71	154	23	59	336
Medium (15-30 m)	30	44	55	1	36	166
Deep (30-60 m)	82	49	40	0	65	236
Very deep (60- m)	16	3	3	0	25	47
Depth unknown	10	12	22	4	308	356
<b>Total:</b>	<b>170</b>	<b>182</b>	<b>275</b>	<b>62</b>	<b>500</b>	<b>1189</b>

Of the 1189 Mediterranean sites recorded, as many as one in four (26%) have been so briefly reported that neither their condition nor their depth is known. Of the rest, wrecks which are well preserved lie mostly in deep water (30-60 m deep), below the influence of storm waves; in shallow water, by contrast, about half the recorded wrecks are scattered. However, Table 1 shows that wrecks in all states of preservation may be found in a great variety of circumstances, and even in shallow water, for example, there are scores of wrecks in perfect or relatively coherent condition.

Some ships foundered in a storm, or were holed on rocks; these usually sank to the bottom in open water, and their contents are preserved more or less complete. Others lost their bottom on a submerged reef, or broke into several pieces; their cargo can be identified, but only as a scattered and fragmentary, but essentially coherent, mass of material. Others again drove ashore on shallow, shelving coasts; no trace at all of the ship survives in such cases, and the remnants of the cargo may be found widely scattered. There is, however, no definite rule governing the conditions of preservation: quite well-preserved wrecks are known from sandy beaches as well as from deeper water, while even exposed situations may yield surprising examples of the survival of material. There is a wide range of physical environments, but classification is nonetheless possible: thus, for example, both **Cala Gadir** and **Plemmirio B** are situated in medium depth, on a tumbled cliff slope with a ledge, while **Mellieha** and **Vendicari** are similarly located among sand and sea-grass in a landlocked bay, close to a hidden reef.

The level of association of material is in fact different at every site. It is not just the case that one can distinguish wrecks (Fr. *épaves*), which are sealed deposits, from mere sites (Fr. *gisements*), which are jumbled and contaminated; the extent and nature of contamination or disturbance of an underwater deposit varies along a continuous scale, and every kind of site deserves consideration (Parker, 1981b). Within a wreck site, not every object may be definitely associated, even where the main

wreck deposit is obviously coherent; it is, therefore, essential not only to review the objects recovered from the site carefully but also to consider the conditions under which the site was investigated and the factors which may have altered it since the ship originally sank.

Apart from the very varied nature of the circumstances of shipwreck, other factors also make a synoptic study of ancient shipwrecks difficult. Some have been carefully and thoroughly excavated; others are known from divers' brief visits, poorly reported; others may have been reported only in the briefest manner, impossible to check. The predatory nature of most divers means that many ancient wrecks are looted, even after being reported to the authorities. Hence, the exact size and nature of many cargoes cannot now be determined. Lastly, some areas have been more thoroughly explored than others. The coasts of Catalonia, Provence and Liguria are much frequented by amateur divers; the number of wrecks reported from those areas is therefore higher than from more remote coasts, such as Morocco, or from waters where diving has been restricted, such as Albania.

### **Location of shipwrecks**

The distribution of ancient shipwrecks by location is summarized in **Figure 2**; for more detailed indications of location, see the **Maps**. Taking each degree of Latitude and Longitude as a notional square, one can observe how unequal is the distribution of recorded wrecks. In the Mediterranean and Black Sea region, one or more ancient wrecks have been recorded in 159 squares, compared with at least 261 coastal and offshore squares from which none has yet been reported. Only 38% of appropriate squares, therefore, have produced reports of wrecks, and even in those squares wrecks are very irregularly distributed: half of the squares with reported wrecks contain only 11% of all wrecks, while 46% (nearly half) of the wrecks are concentrated in only 15% of the squares with reported wrecks.

### **National records**

The knowledge which we have of the ancient shipwrecks in each nation's waters varies greatly (see Table 2, below). The number of sites recorded reflects the geographical and social factors already mentioned, but also the extent to which the nations concerned have developed a system for recording and publishing discoveries. Economic and touristic development, more attention to historic sites, and greater political and intellectual freedom in certain countries will without doubt alter their figures in years to come. The example set by the national archaeological authorities of France and Italy in the publication of underwater sites should be followed elsewhere - in Croatia, for instance, where it is claimed 600 sites are listed in official archives (against some 90 published), or Greece, where it has been said that 1,000 wrecks have been recorded by the Department of Underwater Antiquities, though only about 80 are known to me.

TABLE 2

## Number of wrecks in each state

Italy	428
France	282
Spain	134
Croatia	92
Greece	84
Turkey	63
Israel	31
Cyprus	15
Malta	12
Netherlands; Germany	11
Britain	10
Lebanon	9
Bulgaria	8
(no state); Belgium; Morocco	7
Libya; Switzerland; Syria; Tunisia	6
Algeria; Monaco	4
Channel Islands; Gibraltar; Romania	3
Egypt	2
Georgia; Hungary; Sudan; Ukraine; Yugoslavia (Montenegro)	1

The distribution of ancient wrecks is thus affected by several distorting factors, but careful treatment of the evidence can compensate for the distortions. The very small number of late Roman wrecks in southern France, compared with the vast number of cargoes of the Republican period, cannot be merely an accident of statistics. Moreover, even in the case of badly recorded or damaged cargoes, something can still be determined about their origin which offers documentation of trade; thus, one knows that export from Italy in the last two centuries BC gives way (in the western Mediterranean) firstly to traffic from Spain and then, from the third century AD on, to traffic from Africa.

Moreover, not only can the application of simple generalizing statistics help to bring out trends in the material, but also comparison of sets of data can be made, especially now that the number of sites has (for certain regions and periods, anyway) reached such a high figure.

## CHAPTER 2

### Shipwrecks in Ancient History

The previous chapter emphasizes that shipwrecks, perhaps more than any other class of ancient site or assemblage, have to be studied primarily in their own terms. There certainly are documents from classical antiquity - in art, literature, law, inscriptions, etc. - which can be brought in as explanation or illustration, but it may be better first of all to use the data with the minimum of interpretative overlay, concentrating on any patterning which is self-evident.

The patterns can be very simple - by date - or more advanced - by date set against location. To make a statistical study possible, **Figure 3** is based on a set of 'average dates', calculated for each wreck site by deciding the earliest and latest date within which the shipwreck could have taken place (thus, between 500 and 400 BC for 'Fifth century BC', between 150 BC and AD 400 for 'Roman', and so on), and then taking the mid-point of the date range thus determined. The mid-points are listed in the Index, below, and charted (in grouped frequencies) in **Figure 3**. In **Figure 4** the wrecks have been grouped in periods. The main feature of these charts is the enormous preponderance of Hellenistic (Republican) and Imperial wrecks: over the whole of the Mediterranean, Roman wrecks number over 75% of all wrecks earlier than AD 1500. By comparison, the small number of pre-Classical and Medieval wrecks is most marked. This preponderance is due to a number of factors, some archaeological - in the Hellenistic and Imperial periods, the use of amphoras or the importance of roof-tile and marble transport - but others historical, as in the supply of wine to Gaul in the 1st century BC or of various foodstuffs to Rome in the early Empire. Some of the other features of the date chart, while no doubt distorted by factors related to the nature of cargoes at the time, or circumstances of recovery and recording of information, are of note: such is the apparent revival of trade in the early Byzantine period, which seems to be a genuine historical trend, by comparison with the paucity of wrecks from the end of the Western Empire period.

At certain periods it is possible to date a significant number of wrecks closely enough to compare the date chart with known historical events which might have influenced maritime trade. Thus, in **Figure 5** are charted the well-dated wrecks (mostly of Italian and Spanish amphoras) of the period 200 BC to AD 400 and their possible relationship to events such as the sack of Carthage and Corinth or the establishment of the Pax Augusta. Perhaps it is not fanciful to see a periodic revival of maritime activity in the years following these key events, which in turn tends to confirm that wreck statistics do have some real relationship with wider effects. Such an effect must surely have been the re-establishment of Imperial power from Byzantium, especially by Justinian.

A more detailed study of the date of wrecks can be carried out by the date of the wrecks found in different parts of the Mediterranean. Thus, taking Roman wrecks alone, and using national boundaries to distinguish regions, one finds:

### Roman wrecks in different regions (states)

	Roman %
All Mediterranean	77
Turkey	34
Israel	44
Sicily	55
Spain (Mediterranean)	84
Croatia	85
France (Mediterranean)	87

From this we may see that Roman wrecks predominate among finds in the Western Mediterranean, but number less than half in the East. The same may be seen from **Figure 6**, based on a count of wrecks not by national divisions but by divisions of one degree of Latitude and Longitude: wrecks of the Roman period are predominant in the Western half of the map.

One can in fact compare the frequency of wrecks in different regions, using broad periods of time (**Figure 7**). Selecting six areas of the Mediterranean which have recorded roughly similar numbers of wrecks, one can see that there is a considerable variation in the date histogram. On the coast of Israel and Lebanon, wrecks of all dates are found, from Middle Bronze Age to Mameluke, with clusters in the Classical (Persian) and late Roman (early Byzantine) periods. In SW. Turkey, there is a generally similar pattern, but with a concentration in the Hellenistic period, and more wrecks in the early Byzantine period. By contrast, in SE. Sicily and part of Malta, wrecks are concentrated mostly in the Hellenistic and Roman period, especially in the middle Roman Empire period. In the Strait of Bonifacio there is a different picture: the wrecks are closely clustered in the Roman period (3rd century BC-4th century AD, with a peak in the early Empire) with no earlier or later outliers. The Tuscan Islands show a similar pattern in the Roman period, but in addition there are a number of Archaic and Medieval wrecks. In France, the concentration is markedly different - wrecks of the 2nd century BC markedly predominate. These contrasting patterns can be explained by considering the nature of the wrecks represented in each region: the Bonifacio pattern, for example, is created by the many Roman ships, originating mostly from southern Spain, which were lost there en route to Rome - at other periods this dangerous strait was evidently avoided, or navigated only in favourable conditions. In SW. Turkey, by contrast, the importance of the Rhodian and other amphora traffic in the Hellenistic period and the relatively flourishing state of trade in Byzantine times is responsible for the pattern. The pattern for S. France is formed by the many wrecks of Italian amphoras, no doubt containing wine, lost en route to Gaul in the early years of Romanization and conquest. Other patterns, and further explanations, could be produced for other regions, though the statistical basis is not strong with sets of this size (35-75 sites), and our understanding of the nature of the wrecks in question (especially of the actual origin of the amphoras) is often imperfect.

### Wreck Index: date

**Note.** The catalogued wrecks are listed below by their serial number; the Roman provincial wrecks are placed separately at the end. For purposes of calculating statistics, each site has been dated to within a range of years, and the mid-point of that range is taken as the date of the wreck. In this index the mid-point values are arranged in chronological order in the first column, so that wrecks of a particular period can be found by reading off the serial numbers in the second column.

Date	Serial number
<b>Pre 500 BC</b>	
-2200	362
-2150	741
-1600	1079
-1575	816
-1450	42, 544
-1400	503
-1325	1193
-1300	540
-1250	418
-1200	208, 494
-850	508
-650	1
-600	133, 329, 542
-595	451
-550	324, 365, 394, 599, 718, 742, 835, 993, 1042
-540	183
-537.5	106, 317, 354
-500	113, 432, 441, 846, 1209, 1243
<b>5th century BC</b>	
-490	870
-487.5	915
-475	1127
-462.5	737
-450	13, 58, 75, 205, 217, 223, 434, 539, 541, 809, 922, 971, 983, 1144, 1190
-440	1091
-437.5	237, 550
-425	248
-412.5	431, 879
-410	612
-400	83, 552, 677, 729, 793, 808, 820, 1078, 1081, 1095, 1155
<b>4th century BC</b>	
-387.5	355
-375	145, 739, 895, 1228
-350	19, 72, 128, 191, 313, 440, 527, 545, 562, 595, 674, 756, 839, 1006, 1058, 1107, 1187
-337.5	1227
-312.5	399, 615, 785
-305	563
-300	14, 224, 234, 330, 343, 366, 468, 496, 523, 559, 1109, 1169,

	1184, 1196, 1212
<b>3rd century BC</b>	
-295	1230
-290	1065, 1113
-287.5	1168
-285	1071, 1142
-275	37, 119, 152, 236, 333, 547, 609, 724, 865, 905, 931, 1170
-265	1043
-255	715
-250.5	810, 1181
-250	17, 52, 356, 620, 662, 759, 930, 936, 946, 1089, 1188
-237.5	124, 1075
-225	230, 260, 306, 448, 693, 750, 927, 969, 1132
-212.5	641, 661
-200.5	650, 658
-200	90, 161, 219, 318, 382, 457, 574, 643, 654, 847, 894, 966, 1039, 1061, 1223, 1233
<b>2nd century BC</b>	
-195	472, 593, 986
-190	104, 115, 395
-187.5	151, 962
-175	9, 26, 141, 154, 160, 277, 310, 482, 714, 765, 904, 942, 944, 1038, 1040, 1041, 1177, 1200
-170	85, 88, 285, 312, 531, 979
-165	48
-162.5	304, 500, 866, 1218
-150.5	155, 510, 1057, 1135
-150	10, 20, 147, 233, 244, 337, 363, 555, 571, 617, 636, 676, 709, 711, 802, 804, 955, 958, 1032, 1052, 1073, 1129, 1156, 1172, 1189, 1222
-145	520
-140	57, 489, 1178
-135	47, 95, 689, 844, 960
-125	33, 107, 227, 302, 391, 465, 652, 849, 887, 888, 992, 1048, 1072
-120	175, 388, 442, 1160
-112.5	39, 96, 254, 287, 350, 568, 655, 935, 964, 1101, 1234
-110	476, 512, 786, 1108
-105	77, 373, 974, 987
-100.5	27, 189, 416, 452, 548, 549, 656, 700, 758, 852, 871
-100	16, 79, 173, 195, 197, 200, 226, 269, 271, 282, 286, 291, 309, 314, 326, 383, 393, 424, 469, 621, 633, 666, 684, 769, 850, 898, 910, 1024, 1114, 1199, 1220
<b>1st century BC</b>	
-95	473, 1020
-90	28, 1229
-87.5	41, 89, 249, 331, 396, 458, 467, 480, 596, 753, 845, 907, 917, 947, 951, 1063, 1067, 1134, 1221, 1253
-79	44
-75.5	7, 319, 536, 560, 631, 725, 891, 923, 970, 1140
-75	188, 238, 597, 781, 805, 828, 919, 932, 982, 1010, 1060, 1207
-72.5	198
-70	129, 425



-65 507  
 -62.5 81, 150, 179, 281, 290, 369, 389, 437, 479, 485, 515, 530,  
 680, 710, 719, 757, 822, 827, 843, 867, 933, 940, 1011, 1112  
 -60 616, 1044  
 -55 776  
 -50.5 11, 50, 54, 94, 105, 216, 273, 274, 275, 322, 325, 439, 474,  
 554, 569, 572, 573, 646, 686, 829, 949, 963, 1012, 1019,  
 1083, 1147, 1159, 1195, 1238  
 -50 180, 258, 267, 371, 463, 486, 637, 706, 728, 774, 819, 826,  
 882, 1036, 1046, 1213  
 -47.5 253, 1149  
 -40 475  
 -38 1051  
 -37.5 171, 209, 422, 1035, 1076  
 -36 247  
 -30.5 701  
 -25.5 190, 823, 1090  
 -25 199, 1176  
 -20 984  
 -15 1174  
 -13 743, 1206  
 -12.5 21, 142, 169, 184, 187, 3465, 346, 428, 685, 877, 878, 914,  
 1192  
 -5.5 477  
 -2.5 186  
 0 122, 131, 146, 218, 261, 272, 311, 320, 526, 618, 619, 642,  
 705, 707, 767, 807, 831, 859, 890, 896, 953, 1025, 1096,  
 1120, 1162

**1st century AD**

2.5 950  
 5.5 235  
 7.5 127  
 8 126, 565, 824, 1121  
 10.5 1165  
 12.5 390, 456  
 13 372, 490  
 15 213, 1059  
 17.5 307  
 20 801, 1118, 1119  
 22.5 436  
 25 24, 36, 73, 178, 193, 252, 294, 298, 332, 341, 598, 747,  
 941, 996, 998, 1009, 1066, 1197  
 25.5 49, 99, 153, 174, 392, 840, 1029, 1150  
 30 529, 564, 576, 681  
 35 101, 766  
 37.5 584, 1026, 1141  
 38 257  
 42.5 722, 732, 733, 734, 735, 1171  
 45 374, 875  
 50 31, 55, 100, 221, 283, 316, 364, 426, 429, 478, 511, 647,  
 762, 778, 792, 806, 863, 921, 1102, 1115  
 50.5 51, 56, 62, 82, 84, 86, 164, 177, 279, 308, 359, 423, 447,  
 449, 461, 481, 516, 534, 556, 561, 683, 687, 713, 746, 749,  
 770, 791, 800, 813, 832, 841, 901, 929, 934, 945, 954, 961,

	980, 985, 1064, 1085, 1130, 1133, 1166, 1167, 1185, 1201, 1202, 1235, 1245
51	454
55	157, 412, 413, 585
57.5	583
60	885
62.5	566, 848, 866, 1103
65	377, 1027
72.5	301
74.5	1124
75	80, 344, 347, 348, 586, 613, 667, 761, 779, 812, 881, 1017, 1180
75.5	937
79	501
85	956
87.5	488
90	98, 158, 994
100	12, 30, 143, 323, 435, 553, 659, 764, 775, 909, 1003, 1148
<b>2nd century AD</b>	
100.5	116, 487, 492, 558, 589, 590, 591, 592, 601, 702, 704, 790, 868, 869, 943, 959, 1021, 1248, 1249
110	172, 334
112.5	78, 632, 814, 1088
115	972
120	470, 513
125	64, 65, 66, 67, 91, 132, 144, 159, 194, 207, 243, 250, 255, 262, 299, 303, 336, 400, 414, 419, 420, 421, 444, 445, 455, 484, 575, 587, 698, 717, 777, 780, 913, 926, 948, 976, 1005, 1016, 1018, 1031, 1037, 1047, 1054, 1082, 1086, 1094, 1097, 1104, 1105, 1106, 1122, 1123, 1157, 1203, 1225, 1226
125.5	38, 110, 130, 380, 872
127.5	892
135	1219
138	192, 270
140	1000
142.5	648
145	928
150	5, 35, 74, 139, 266, 278, 402, 460, 524, 528, 604, 610, 635, 712, 720, 731, 736, 773, 817, 825, 837, 876, 1008, 1013, 1098, 1182, 1216
150.5	34, 339, 723, 957, 1049, 1116, 1186, 1204, 1205, 1247
151.5	1002
165	504
170	438
175	222, 228, 288, 433, 906, 1004
187.5	163, 358, 578, 668, 952
192.5	1163
199.5	214
200	45, 170, 242, 251, 464, 696, 834, 938, 1143
<b>3rd century AD</b>	
200.5	18, 156, 225, 256, 264, 293, 378, 406, 409, 411, 614, 653, 672, 798, 899
205	965
212.5	453, 920

222.5	755
225	670, 691, 692, 695, 708, 726, 1014, 1022
237.5	76, 220, 246, 300, 368, 842, 916, 973
250	120, 136, 229, 386, 410, 443, 495, 519, 579, 669, 771, 851, 912, 918, 1034, 1151, 1152, 1153, 1175, 1183
255	125, 138
262.5	321, 925
274	338
275	140, 315, 327, 880
277.5	166
283	68
287.5	675, 772, 1030
300	22, 182, 232, 353, 387, 405, 408, 415, 522, 577, 649, 697, 727, 797, 897, 977, 1154
<b>4th century AD</b>	
302.5	398
308	688
308.5	1217
310	176
312.5	123, 588, 611, 815, 975
312.5	975
313	471
315	87, 645
317.5	514
320	594
325	185, 231, 567, 580, 325, 830, 1100
330	1198
337.5	284, 673, 978
350	148, 196, 280, 305, 403, 404, 407, 491, 581, 582, 748, 1045, 1252
362.5	699, 721, 760, 1084
372.5	1055
375	6, 381
400	376, 517, 833, 874, 1117, 1208, 1236, 1240
<b>5th century AD</b>	
412.5	466, 505, 682, 873
422.5	375
425	740, 811, 990, 991
437.5	1137
450	137, 292, 570, 1179
487.5	506
500	357, 509, 532, 836, 860, 861, 1069, 1146, 1211, 1224
<b>6th-10th centuries AD</b>	
512.5	401
520	671
525	111, 202, 215, 245, 351, 397, 446, 889, 902, 1131, 1244
537.5	268
550	204, 206, 525, 6768, 679, 782, 795, 884, 900, 1092, 1093
550	900, 1092, 1093
562.5	738
575	59, 660
587.5	518
600	71, 1145
612.5	1001

625	787
627.5	1239
631	483
650	203, 212, 367, 1068
675	968
687.5	352
750	543
800	657
850	1125
900	864, 1250
925	703
950	8, 97, 360, 644, 821, 1053
<b>11th-15th centuries</b>	
1000	498, 1191
1025	1070
1037.5	1074
1050	70, 385, 557, 1139, 1194
1075	744, 745
1100	93, 109, 911, 1110, 1111
1150	165, 361, 796, 883, 1161
1175	663, 664
1187.5	1099
1200	117, 768, 1215
1225	335, 538
1250	53, 167, 265, 665, 694, 799, 903, 924, 1062, 1087, 1128, 1136, 1138, 1246
1275	2
1300	450, 537, 551, 1023
1350	211, 384, 730
1375	349
1400	259, 803, 862
1404	690
1432.5	289
1450	3, 276, 638, 639, 716, 794, 989, 995
1475	181, 605
1487.5	427
1500	23, 43, 162
<b>Undated</b>	
-	15, 25, 32, 46, 60, 61, 69, 92, 112, 114, 149, 201, 210, 239, 240, 241, 263, 328, 370, 417, 459, 462, 493, 535, 546, 600, 640, 754, 788, 818, 893, 981, 988, 999, 1015, 1033, 1050, 1056, 1158, 1164, 1237, 1251
<b>Roman ships and boats outside the Mediterranean</b>	
	4, 29, 40, 63, 102, 103, 108, 118, 121, 134, 135, 168, 295, 296, 297, 340, 342, 379, 430, 497, 502, 521, 533, 602, 603, 606, 607, 608, 622, 623, 624, 625, 626, 627, 628, 629, 630, 651, 692, 751, 752, 763, 789, 838, 853, 854, 855, 856, 857, 858, 908, 997, 1007, 1028, 1077, 1080, 1126, 1173, 1210, 1214, 1231, 1232, 1241, 1242, 1254, 1255, 1256, 1257, 1258, 1259

## CHAPTER 3

### Shipwrecks and commerce

The importance of wrecks for the preservation of original information can be seen from the fact that amphora stoppers of some kind have been recorded in as many as 90 wrecks, and inscriptions (whether painted or stamped) survive on amphoras in no fewer than 155 wrecks. Amphoras often retain their original contents (such amphoras have been recorded in 55 wrecks, not counting amphoras filled with resin).

A consideration of the types of amphora found in ancient wrecks shows some significant variations in frequency: see the Table, below. There are rather few pre-Classical amphora cargoes, parallel to the low frequency of such wrecks altogether. Punic amphoras number rather large in the Table, though of course this category of amphora covers a long period (6th-1st centuries). Amphora cargoes become much more numerous when Graeco-Italic amphoras appear in the late 4th/early 3rd century BC; these amphoras effectively succeed Corinthian amphoras as wine amphoras in the W. Mediterranean. Italian wine amphoras (see **Figure 8**) become even more frequent from the mid 2nd century, when Dr. 1 and Lam. 2 amphora cargoes bulk large in the figures - about two-and-a half times as many cargoes (c. 150-1 BC) of these amphoras as cargoes of Graeco-Italic amphoras in the equivalent preceding period (c. 300-150 BC). This dramatic expansion in Italian wine exports has been amply discussed (especially by Tchernia, 1986), but remains impressive, especially as more discoveries of such wrecks continue to be made, not just in S. France, but also in the C. Mediterranean and the Adriatic.

The number of Dr. 2-4 cargoes, by contrast, is similar to that of Graeco-Italic, and even counting in cargoes of Gaulish pearshape amphoras does not bring up the number of early Imperial wine cargoes to anything like the late Republican level. Rhodian amphoras of Roman type are fairly well represented, especially in the Aegean region. Cargoes of S. Spanish olive oil (Dr. 20 amphoras) and other products (Dr. 7-11, etc. amphoras) are relatively numerous in the 1st-2nd centuries, to be largely supplanted in the statistics by African cargoes (Afr. 1 & 2 and cylindrical amphoras) in the 3rd-4th centuries AD; note, however, that Tripolitanian amphoras (found only at **Capo Plaia** and **Grado**) are almost entirely absent from the wreck cargo record, in contrast to their relative abundance in finds on land. A comparable gap is found with Beltrán 4B (Lusitanian Dr. 14) amphoras, which are relatively frequent in Italian land finds, but of which only two cargoes are known (at **Cap Bénat A** and **Conillera**). Byzantine amphora cargoes do not approach even the late Empire African amphora wreck numbers, whether in the 5th-7th centuries (globe and baluster amphoras) or in the 10th century onwards.

Table pottery was never a major item of cargo in the Mediterranean region. Many of the black-gloss pottery consignments were complementary to a cargo of Graeco-Italic or Dr. 1 amphoras. Likewise, a few cases of coarseware, included in a larger cargo, rather than a whole shipload of pottery, are the normal type of coarse pottery cargo (but cf. **Pakleni** and related Dalmatian wrecks). The small number of mortaria cargoes is perhaps surprising when one looks at the wide distribution of mortarium stamps in the Roman Empire (Hartley, 1973). Cargoes of tiles are much more numerous, but are especially concentrated in S. France (where they are part of a very

active local distribution traffic, as at Les **Roches d'Aurelle**) and in Dalmatia (where the topography made seaborne distribution of heavy goods necessary).

The rather many lead, copper and tin cargoes represent one of the chief contributions made by underwater archaeology to the history of trade, even though a good deal of work has still to be done on cleaning, deciphering and analysing the ingots from some of the wrecks. For the most part, consignments of ingots, like other goods, tended to be rather small and to form just part of a cargo (but see **Mal di Ventre** for a large consignment). This is true also for iron bars, represented in a surprisingly large number of wrecks, fifteen of them Roman. By contrast, considering the ease of their preservation and discovery, cargoes of marble are rather few; sarcophagi are especially rare, at least by contrast with the interest they have aroused (e.g. at **San Pietro**). Grinding stones are perhaps less common than one might expect; not all cargoes have been thoroughly studied, but two which have (**El Sec** and **Isla Pedrosa**) turn out to be 'trade lot' made up from a number of sources, rather than a bulk consignment from a single quarry (Williams-Thorpe & Thorpe, 1987 & 1990).

Works of art, such as statues or figurines, turn up as part cargoes at various dates, though the most famous are spolia of the late Republic (Gianfrotta, 1981b). Neither lamps nor glass vessels are as frequent as one might expect, especially as they occur at all periods.

#### Cargo summary

N.B. Each recorded occurrence of a cargo category is counted; the total therefore exceeds the number of actual wrecks.

#### AMPHORAS

Pre-classical jars	3
Etruscan amphoras	11
Punic amphoras	40
Rhodian amphoras	21
Corinthian amphoras	16
Greek amphoras (not otherwise classified)	75
Pre-Roman amphoras (not otherwise classified)	11
Graeco-Italic amphoras	69
Amphoras transitional from Graeco-Italic to Dr. 1	8
Dr. 1A amphoras	54
Dr. 1B amphoras	45
Dr. 1C amphoras	26
Dr. 1 amphoras, type unspecified	17
Dr. 1 amphoras, combined types	124
Spheroidal amphoras (cf. Panella 2)	11
Republican amphoras (not otherwise classified)	49
Lamboglia 2 amphoras	63
Dr. 6 (& Dr. 15) amphoras	10
Dr. 2-4 amphoras (Italian type)	12
Dr. 2-4 amphoras (Spanish type)	24
Dr. 2-4 amphoras (uncertain type)	31
Dr. 2-4 amphoras, combined types	64

Pascual 1 amphoras	16
Dr. 7-11 amphoras	40
Dr. 12/14 amphoras	21
Haltern 70 amphoras	15
Beltrán 2B amphoras	17
Beltrán 2A amphoras	11
Beltrán 4B amphoras	2
Dr. 20 amphoras	54
Panella 36 amphoras	2
Rhodian amphoras (Roman type)	11
Early Imperial amphoras (not otherwise classified)	38
Dr. 21-22 (Panella 3) amphoras	1
Richborough 527 amphoras	2
Pearshape amphoras (Laubenheimer G4, etc.)	19
Pearshape amphoras (Mauretanian type)	4
Pearshape amphoras (uncertain type)	12
Tripolitanian amphoras	2
Africana 1 amphoras	12
Africana 2A amphoras	11
Africana 2B-D amphoras	23
'Spatheion' amphoras	6
Almagro 50 amphoras	13
Almagro 51A amphoras	4
Almagro 51C amphoras	14
Kapitän 1 amphoras	7
Kapitän 2 amphoras	7
Amphoras cf. Panella 40-49	11
Late Roman cylindrical amphoras	31
Roman amphoras (not otherwise classified)	62
Byzantine amphoras (globe-shaped)	12
Byzantine amphoras (baluster-shaped)	6
Byzantine amphoras (not otherwise classified)	45
Arab amphoras	5
Amphoras of uncertain type	40
<b>POTTERY</b>	
Fineware (black-gloss)	46
Fineware (terra sigillata)	15
Fineware (not otherwise classified)	45
Coarseware	37
Mortaria	8
Pottery (not otherwise classified)	24
<b>TILES</b>	
Roof-tiles	40
Tiles (other than roof-tiles)	5
<b>METAL &amp; ORE</b>	
Lead ore	2
Lead ingots	46
Lead (other than ore or ingots)	7
Iron ore	1
Iron bars	16

Copper ingots	27
Tin ingots	16
Ingots (other than lead, iron, copper or tin)	8
Ore (other than lead or iron ore)	5
Metal goods (bronze or copper)	19
Metal goods (not bronze or copper)	18
<b>STONE</b>	
Sarcophagi	5
Marble columns	19
Marble blocks, etc.	22
Building stone	11
Rubble	1
Grinding stones	18
Stone cargo (not otherwise listed)	7
<b>VARIOUS CARGOES</b>	
Works of art	24
Louteria	1
Pithoi	7
Dolia	19
Pine-cones	1
Resin	13
Pipes (terracotta)	4
Glass vessels	12
Glass (other than vessels)	7
Lamps	21
Other cargo	33

### Shipwreck cargoes and land finds

What does the distribution of wrecked cargoes mean in terms of patterns of ancient trade? Does their location relate in any meaningful way to the actual production and consumption of goods and supplies? Obviously ships may sink almost anywhere, at the mercy of wind and current; on the other hand, as statistics build up, one can see some tendencies emerge. One such is in the Strait of Bonifacio, where the wrecks (as we have seen) are predominantly cargoes from Spain, lost en route to Rome in the early Empire; here there is a direct correlation between losses at sea and evidence from land (see **Figure 9**). A similar case lies with Pascual 1 amphoras (**Figure 10**): all sixteen wrecks are located in Catalonia (one on Majorca), more or less entirely between the area of production and Narbonne, which must have been the main point of trans-shipment on into Gaul - these amphoras are rarely found in Italy (Tchernia, 1971b). One may compare with this the distribution of Dr. 6 (& Dr. 15) amphoras, which were definitely made in Istria and N. Italy: the map (**Figure 11**) has quite a good resemblance to the general distribution of (stamped) finds on land, allowing for some weighting towards S. France.

In other cases the relationship between wrecks and land finds is less clear. Thus, with Lam. 2 amphoras, most or all of which must have been made in Apulia, the map of land finds (**Figure 12**, derived from the stamped examples listed by Desy, 1989) extends much further, and in rather different directions, from the wreck map. The amphoras of form Kapitån 2,



made in the Aegean region (**Figure 13**), have been rather widely reported from land finds, but the wreck distribution does not really mirror this, perhaps mostly because of gaps in our records for the Aegean and Black Sea regions. The map of African cargoes (**Figure 14**) emphasizes that some routes were longer and more dangerous than others - from Carthage to Rome, if not to Arles or Aquileia, was a shorter voyage, with better landfalls, than some other regular trade routes, and the cargo statistics may well be reduced for wrecks of this type (and period) because of this factor. This does not mean, however, that one has to be sceptical about **any** distribution; this kind of insight into possible distortions of the evidence makes true patterns easier to spot where they do occur.

### Compound and bulk cargoes

In order to study this variability, a selection has been made of shipwrecks, datable between 400 BC and AD 400, that were both well preserved and thoroughly investigated and reported. Numbering 98, this selection provides a sample which can be tabulated with confidence.

#### Cargo categories represented

	Wrecks	%
1 Amphoras	92	54
2 Pottery	26	15
3 Tiles	5	3
4 Metal & ore	17	10
5 Stone	4	2
6 Other	27	16
	<u>171</u>	

The percentages here emphasize the tendency for better-preserved, fully investigated sites to produce a greater diversity of cargo, especially pottery, compared with all the catalogued shipwrecks. Obviously, smaller objects may not be visible without excavation, or may have been damaged in a poorly-preserved site.

Now, how diverse are the cargoes of these wrecks? One can tabulate the frequency of cargo categories per site, thus:

#### Diversity of selected cargoes

No. of cargo categories present	No. of sites	%
1	50	51
2	29	30
3	14	14
4	4	4
5	1	1
	<u>98</u>	

One in every two of the sample wrecks thus appear to have carried only one category of cargo - in the great majority of cases this was amphoras (amphoras 45, pottery 2, tiles 2, stone 1, metal & other 0). On this basis it is true to say that Hellenistic/Roman traffic was balanced between

'bulk' cargoes and compound cargoes; few, however, were 'tramps' or general cargo carriers, with a very wide range of goods on board. Within the sample there is no trend in date or origin regarding the simplicity or complexity of the makeup of the cargo. It is worth noting that, of the 29 cargoes made up of two elements, only 9 consist of amphoras and pottery: ships laden with wine amphoras (like La **Madrague de Giens**) do indeed carry pottery drinking vessels, etc., as complementary cargo, but they often carry further types of cargo as well.

One can study this diversity more closely, however, by making a count of the detailed classifications of cargo represented in the sample wrecks. By counting different forms of amphora, different metals, types of stone object, etc., a total of 100 classifications of cargo can be registered. If, for each wreck in the sample, the number of these classifications is counted, we find:

No. of cargo classifications	1	2	3	4	5	6	7	8	9	10	11	12	13
Per cent of wrecks with these	30	20	17	11	12	3	2	2	1	1	1	0	1

(the highest number of cargo classifications recorded being at El **Sec**). This shows that the makeup of Hellenistic and Roman cargoes was more diverse than the simple analysis by category of cargo showed, for only 30% of the sample wrecks contained a single class of cargo object (i.e. amphoras of just one type, or only columns of stone). Over half the sample wrecks had from two to five classifications of cargo objects on board - two types of amphora at **Titan**, or 5 different types of object in all at **Procchio**, for example.\*

#### Assembled cargoes and the structure of trade

At **Dramont A** the ship's owner appears to have been engaged in shipping wine, and at **Yassi Ada A** the master is thought to have been a trader, too. Were trader-skipper, looking for a market from port to port, the normal pattern of ancient commerce? In the Roman period, this was at first not the usual case, for 1st century AD Spanish cargoes (see **Figure 9**) such as **Port-Vendres B** must often have been shipped from southern Spain together, not assembled at an entrepôt en route. Collecting together the different goods in a Baetican port for shipping onwards towards Rome or NW. Europe implies that the trade was commissioned, not the result of casual selling and buying of goods by the skipper. In the 2nd century, however, there were some ships which did not sail directly from Baetica to a distant destination, but picked up cargo along the way: see **Saint Gervais C** and **Tiboulen de Maître**. No doubt ports such as Narbonne, known from inscriptions to have been the headquarters of merchants' families, acted as

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\* These are the index numbers of the 98 wrecks summarized in this section: 24, 28, 44, 80, 104, 123, 125, 127, 142, 153, 158, 161, 171, 186, 188, 195, 200, 233, 236, 238, 254, 267, 271, 282, 301, 302, 304, 307, 312, 326, 334, 364, 371, 373, 374, 376, 377, 392, 425, 453, 472, 486, 513, 527, 531, 563, 565, 571, 578, 585, 593, 610, 616, 708, 715, 776, 781, 783, 784, 785, 801, 806, 814, 819, 824, 831, 844, 850, 874, 898, 906, 912, 916, 932, 960, 992, 994, 1002, 1032, 1055, 1058, 1060, 1071, 1108, 1114, 1117, 1118, 1121, 1149, 1171, 1174, 1176, 1192, 1206, 1216, 1220, 1222, 1240.

entrepôts for traffic of this kind, which no doubt responded to orders as well as to weather and market conditions. In the late Roman period, cargoes such as those of **Femina Morta** appear to testify to something like a triangular traffic involving Africa, Spain and Italy, and at **Sobra** there is a compound cargo which seems to have been the result of setting down and picking up goods along an extended route. This evolution of seaborne trade is echoed in other features of Roman shipwrecks, mentioned below.

## CHAPTER 4

### **Ships and People**

The earliest surviving ship is Egyptian - the river boat of Cheops, deposited in a rock-cut pit in c. 2350 BC. This boat, like the rather later boats from Dashur, was assembled by a complicated system of cleats and lashings, which, while obviously appropriate to conditions in Bronze Age Egypt, was not used for Mediterranean sea-going ships. As far as the earliest Mediterranean wrecks are concerned, no structure has been found (at least, so far) at **Dhokos** or **Newe Yam C**; nor is there any trace at **Sheytan Deresi**, where the complete absence of any hull remains has prompted the suggestion that this could have been a skin boat. Not till **Ulu Burun** (c. 1350-1300 BC) and **Cape Gelidonya A** (c. 1250-1150 BC) does one find preserved hull structure, and in each case the method of assembly is quite different from that of the Egyptian river boats. These ships, like the great majority of sea-going Mediterranean ships down till the late Roman period, were built shell-first by the so-called mortice-and-tenon, or draw-tongue joint, technique. In one of the best-preserved and most thoroughly studied examples, the wreck of **Kyrenia** (c. 310-300 BC), the ship's hull was an impressive example of craftsmanship (as described in interim form by Steffy, 1985a): the keel, stem- and stern-posts and strakes were carved with the adze to a complex shape, and fitted painstakingly together with thousands of joints, each made by drilling and chiselling out two mortices, one in each edge of two adjoining strakes, placing them together over a false tenon, and locking the whole joint with two holes, bored through the strakes and the tenon, which was made fast by driving in small treenails. This type of construction produced a strong, firm hull, but was expensive in terms of both skilled labour and high-quality timber; it was also more appropriate to smaller vessels, for to lift inboard and trim the large frames of ships such as that at La **Madrague de Giens** must have been difficult (as illustrated, for example, by J-M. Gassend in Tchernia *et al.*, 1978, pl. XLI).

Other types of boat-building materials and construction were certainly in use in the Classical Mediterranean; some, such as reed craft or bladder-rafts, do not survive, but ships assembled with stitching, instead of mortice-and-tenon joints, do. This technique was used for the ships wrecked at **Giglio Campese** (c. 600-590 BC) and **Bon-Porte** (c. 550-525 BC), which both had Etruscan associations, and also for the wreck of **Gela** (c. 520-480 BC) from which the finds are all Greek. Perhaps this was in fact a regional school of shipbuilding, at any rate at a period when the mortice-and-tenon technique had not become universally adopted. Stitched planking is found again in the Roman and Medieval periods, but only in the northern Adriatic region, where it was used in the lagoon boats of **Valle Ponti** (late 1st century BC), **Cervia** (late Roman period), **Borgo Caprile** (early Medieval) and **Pomposa** (late Medieval or post-Medieval). From the same general region, but one (at least) of them a sea-going boat with a keel, are the two Roman boats found in the harbour of **Zaton** (Dalmatia). Stitched boats need a good deal of maintenance, but they can be cheap to build, and the ease with which they can be disassembled and repaired can offer advantages in use. However, for the most part, classical ships were assembled with jointed hulls.

## Development of ancient ship construction

The earliest surviving classical hulls show a variety of building technique, but they are too few in number for one to generalize about possible national or regional characteristics. Thus, the 5th-century BC ship found at **Ma'agan Mikha'el**, clearly of Levantine if not definitely Phoenician origin, is mostly of normal mortice-and-tenon construction, though the joints are widely spaced, the planking light, and the frames carefully fitted together to give internal rigidity. The Punic Ship of **Marsala** (3rd-2nd century BC), with neo-Punic signs painted on the hull by the shipwrights, does not resemble this: it has some distinctive characteristics, however, in being made of sawn (not adzed) planks, some of which were pre-assembled (with the usual mortice-and-tenon joints) before being set in place. Prefabrication of sections of planking is unlikely to be observed in more than a minority of well-preserved and carefully studied wrecks; it obviously implies a quite different approach to hull construction from that of the **Kyrenia** ship, and might be a regional characteristic, for it was used in assembling the wreck of **Colonia de Sant Jordi A** (c. 110-90 BC), which has a variety of shipboard material (as well as Italian pottery and cargo), some of it of Punic type. By contrast with the Ma'agan Mikha'el ship, the 4th-century BC wreck of **El Sec** is of a heavily built ship, showing some distinctive details, but in general resembling that at Kyrenia; the origin of this ship is unknown, but her final voyage, anyway, seems likely to have begun in Greece. The same is true of the rather earlier ship at **Porticello**, whose hull, though not well preserved, was evidently close-jointed, and which carried a good deal of Greek (as well as Punic) goods.

Various techniques were used from the earliest times to fasten the ship's frames to the hull planking: treenails on their own, treenails transfixed by iron or by copper nails, and iron or copper nails alone, are all found from the 5th century BC on. Sometimes more than one technique is used in the same ship. The stitched boat of **Valle Ponti** has bindings to fasten its frames to the hull, but the Archaic wreck at **Gela** uses nails of both iron and copper. One of the most individual Graeco-Roman ships is **Cap Bear C** (c. 50-25 BC): bindings were used alternately with treenails in the assembly, the only known example of this from Graeco-Roman wrecks, and there are some other unusual feature of the construction. Nothing has been reported from the site to suggest the home port of the ship; however, it is possible that particular traditions (or, indeed, innovations) are represented in ships linked with NE. Spain. Two Balearic wrecks of the 3rd-2nd centuries BC, **Binisafuller** and **Colonia de Sant Jordi A**, have the planking tenons fixed with two treenails at one end, one at the other. The Binisafuller ship seems to have been engaged on the route between the coast of Catalonia and the island of Ibiza. Likewise, the 1st century BC/AD Roman wrecks of **Cap del Vol**, **Los Ullastres** and **Perduto** all have a flat bottom, as well as other distinctive characteristics of hull form, and seem to constitute a class of ship associated with the export of wine from Catalonia (Foerster, 1988). The distinctive character of such ships is clear, especially if they are compared with fine, deep-keeled hulls such as those of **Spargi** (c. 120-100 BC) or **La Madrague de Giens** (c. 70-50 BC); but other ships, usually small, such as **Titan** (c. 50-45 BC) or **Ladispoli A** (c. AD 1-15) are not dissimilar in this respect. One could discuss extensively what determined the form of a ship; the nature of the cargo is one possibility, especially as the Ladispoli ship carried large dolia for wine

- but, on the other hand, the dolium-carrier at **Grand Ribaud D**, although not well preserved, seems to have been of entirely 'normal' shape. The tile-carrying ship at **La Luque A** (c. AD 140-160), with its flat bottom and thick ceiling planks, might have been shaped with tile cargoes in mind: however, it is at least as likely that it was used essentially for local traffic around Marseilles, and was formed with a view to grounding and loading on beaches. Such is the natural interpretation of the **Cap del Vol** ship, whose keel can be seen to have been worn down in use, and which was fastened with both treenails and iron nails (as was the double thickness of bottom planks at **Titan**). The deeper-keeled ships, which needed to put in to harbours with quays, were more suited to fast, open-sea passages.

During the Roman period, changes took place in the construction of cargo ships. The wreck of **Punta Ala** (mid 3rd century AD) was fastened with iron rivets (the earliest recorded use of iron bolts), and at **Dramont F** (c. AD 400) the iron fastening nails passed through the ceiling as well as the strakes and frames. At **Yassi Ada B** (of the same date) the planking assembly tenons were widely spaced and fitted only loosely in the mortices, and at **Port-Vendres A** the tenons were irregularly spaced and the seams were caulked. This movement away from reliance on the hull's integrity and towards skeleton-based construction continued in the 6th-7th centuries, as seen at **Pantano Longarini** and **Yassi Ada A**; in the early 7th century, at **Saint Gervais B**, joints between planks were used only at the bow and stern, and the ship was essentially built by nailing planking on to the frames. A gap in our evidence follows, until the 10th century; none of the three Saracen wrecks of this date (**Agay**, **Bataiguiet** and **Plane C**) has edge-jointed planks, nor does the 11th-century wreck of **Serçe Limani A**, though detailed study of this hull suggests that the shipwright still relied to some extent on the emergent hull shape, rather than lofted lines, to cut some of the frames (Steffy, 1982; Van Doorninck *et al.*, 1988). Skeleton assembly continued to be used in successive centuries (e.g. at **Pelagos** and **Culip F**), though not much detailed study has yet taken place of well-preserved hulls of the Medieval period in the Mediterranean.

#### **Roman boats and ships N. of the Alps**

In most regions to the N. of the Mediterranean, dugouts (logboats) were used in prehistoric periods. They continued to be made and used right up till modern times, and several provinces (as well as northern Italy) have produced one or more of Roman date (see: **Ancenis**, **Bevaix NE 1917**, **Chaudeney-sur-Moselle A & B**, **Cudrefin**, **Hardham**, **Mainz G**, **Monate (Lago di)**, **Pommeroeul F**, **Portomaggiore**, **Sanguinet**, **Valle Isola A & B**, **Zwammerdam A & E**). Under the stimulus of Roman conquest and development, a variety of boat types emerged; some, associated especially with the Rhine and the Swiss lakes, were developments of dugouts, in which chine timbers (formed by hollowing and splitting a log) were combined with bottom and side strakes to form a roomy, punt-like boat (see: **Abbeville**, **Bevaix**, **Druten**, **Kapel Avezaath**, **Mainz H & J**, **Pommeroeul C, D & E**, **Woerden**, **Yverdon**, **Zwammerdam B, D & F**). These boats had planks which were laid edge to edge and caulked; so, too, were skeleton-built boats, such as those of rounded section found at **London (New Guy's House)** and **Wantzenau**, and others, capable of sea voyages, with a flat bottom, found at **Bruges**, **London (Blackfriars)**, **Mainz (A)** and **Saint Peter Port**. Of generally similar construction to the last group are the slender boats, perhaps warships, found at **Mainz (B-F)**, while shell-built hulls, fastened with trenails in

Mediterranean style, have been found at **London (County Hall)**, **Oberstimm**, **Shiant** and **Vechten**. This rich variety of constructional types must in some sense reflect different pre-Roman traditions, but the supposed pre-Roman forebears of most of the above boats have not been found; it may be that, in shipwrightly as in industry, farming or building, the advent of Roman rule brought about rapid developments among provincial subjects.

Many of the boats named in the last paragraph were quite small, for use on rivers or lakes or in harbours. In the Mediterranean region, too, a great variety of small craft served harbours and coastal settlements; for different shapes of boat, see **Ginosar**, **Herculaneum** and **Toulon**, and for a variety of size and function, see **Fiumicino**. With the exception of the N. Adriatic stitched boats mentioned earlier, however, these Mediterranean small craft were of standard mortice-and-tenon construction.

### **Mediterranean ship construction**

As far as the general picture of ancient Mediterranean ships is concerned, at first sight there seems to be a good deal of information, for something of the hull survives in 189 wrecks; however, in only 37 is the side, as opposed to the bottom, preserved, and only 33 are known to retain the mast step. Generalization about the size or the sailing quality of ancient ships is therefore dangerous, leaving aside the great variety of constructional techniques already discussed. The wood used for one or another part of the ship has been identified at 59 Mediterranean sites; there seems to be no obvious pattern in the use of species - frames were usually of oak, elm or pine, planks most often of pine or fir, the keel often of oak, and treenails of a range of woods including evergreen oak, olive and carob. The big amphora carriers at La **Madrague de Giens** and **Albenga** were built of fir or other softwood strakes (for lightness), with frames of oak (for strength); compare the humbler ships at **Kyrenia**, with planking and frames all of Aleppo pine, or **Cavalière**, of Bosnia pine. Overall, the wrecks offer no clear evidence for the exhaustion of timber resources, though this has been suggested by some.

### **Size and sailing qualities**

The size of ancient ships, judging by preserved remains, stayed broadly constant from the 5th century BC to the 12th century AD, though the very largest ships date from the 1st century BC and 1st century AD, and there is a slight decline in average size during the Roman period (cf. Parker, 1990: fig. 7). Among wrecks which have been surveyed or excavated in detail, it appears that one can distinguish three classes: (1) the smallest, with under 75 tons of cargo, or 1500 amphoras - the commonest kind, found in all periods; (2) a medium range, with a cargo weighing 75-200 tons, or 2000-3000 amphoras - within the period 1st century BC-3rd century AD; (3) the largest, with a cargo of over 250 tons, or more than 6000 amphoras - mostly of the late Republican period, with some heavy marble cargoes in the later Empire as well.

The best information about the sailing qualities of ancient ships comes from Kyrenia II, the replica based on the wreck of **Kyrenia** (q.v.). The times given for voyages in antiquity (e.g. by Casson, 1971: 281-96) will have to include time spent waiting for the wind to change, or, indeed, blow at all. Oars or sweeps have not been found in any wreck, though such things are very likely to float away, as the masts must often have done,

too. Classical ships apparently did not have boats which could tow them in a calm, though early Medieval ships did - so how they proceeded in a calm is unknown. Kyrenia II suffered calms, and spent much of one trial voyage under tow from a naval vessel. The Kyrenia wreck was not a large ship, or specially efficient, and no doubt many aspects of ancient rigging or sailing have not yet been rediscovered by those sailing the replica, so one could expect a good performance from larger ships.

Lead sheathing, while it is a well-known feature of Mediterranean ships in the Graeco-Roman period, has been reported from only 57 sites. The earliest use of it is at El **Sec** (mid 4th century BC), and it is common in the 1st century BC and 1st century AD; thereafter it passes out of use, the latest definite example of continuous sheathing (as opposed to detached fragments, or patches) being **Procchio** (c. AD 160-200). Obviously there may be many examples still to be discovered when timbers are freed and examined; but by no means all ships were sheathed - **Dramont A**, for example (which in other respects resembles La **Madrague de Giens**) has no sheathing, though fabric was placed between the two layers of bottom planking and something was painted on internally. The lead was sometimes applied over fabric, and at La **Luque B** (early 4th century AD) the hull was covered with fabric alone. The **Dramont F** wreck (early 5th century AD) was coated with pitch both inside and out, but had no other coating. Indeed, ships of all periods might be covered with pitch internally, and at **Cap del Vol** and **Palamos** it incorporated a hair-cloth blanket or caulking; at **Jaumegarde B** (2nd century BC) a caulking paste was smeared between the joints and over the internal features of the hull, even though it was also lead-sheathed. All these measures were no doubt intended to make the hull watertight, and perhaps to discourage marine fouling. Lead sheathing must have been expensive (as one might guess from its lavish use on the **Nemi** ships), and perhaps that is why its use was abandoned in the mid-late Roman Empire. With this in mind, it is noteworthy that the six sites which have produced sheathing of copper (usually thought to have decorated the ship's prow) are all of the 4th-2nd centuries BC. In any case, sheathing, whether of lead or bronze, was obviously unlikely to be applied to a ship which was intended to be regularly drawn up on a beach; no doubt for this reason, too, it has not been found on any Roman ship in N. Europe.

Copper nails are found in wrecks of all dates between the 6th century BC and the 5th century AD, but are most frequent (15 out of 55 wrecks) in the 1st century AD. Iron nails, by contrast, are infrequent in the 1st and 2nd centuries AD, but their usage rises in the 3rd and 4th centuries AD (and thereafter becomes normal). A similar process, of coming to use iron rather than copper, may be seen in the bolts or rivets used to fasten frames to keel or wales: copper was used from the 2nd century BC to the 2nd century AD, iron from the 3rd century AD on. Compare the reliance on iron anchors (below). Copper, used on the scale of the Kyrenia ship (for example), was certainly more expensive than iron, and this economy would parallel that seen in the decline of lead sheathing, though one cannot rule out a change in technology or shipwrights' preference.

It is improbable that lead sheathing was attached to a leaky hull as a repair; however, there is relatively frequent evidence for repairs, indicating that efforts were made to keep ships in use for as long as possible. This sort of observation is possible only where the hull has been studied in detail, as at La **Madrague de Giens**, where two strakes were replaced; more obvious repairs have been observed at **Jaumegarde B** and **Perduto**, for example. In the special circumstances of Lake Galilee, it is



not surprising that the **Ginosar** boat includes several reworked pieces. On the whole, the craftsmanship of both construction and repairs in ancient ships seems to be good.

Thirty-two ancient wrecks have produced the remains of a ship's pump; the vertical wooden trunk and continuous disc-chain which raised water to deck level sometimes survives (though it was an objective of ancient salvors, e.g. at La **Madrague de Giens**), but quite often the lead collector and twin pipes which evacuated the bilge-water overboard have been found, lying on top of the cargo. Pieces of lead pipe have been found at El **Sec**, **Serçe Limani B** and La **Ciotat A**, but the earliest definite examples of pumps are from late 2nd century BC wrecks, and it may be that earlier ships depended on bailing.

### **Lading and ballast**

Cargoes were carefully stowed. Heavy goods such as ingots of lead or copper were loaded at the foot of the hold; lightweight goods, such as pottery, were usually stowed on top of the main cargo (as at La **Madrague de Giens**) or fore and aft of it (as at La **Tradelière**). Amphoras could be stowed in anything from one layer (as at **Cavalière**) or two layers (as at **Titan**), up to at least five, perhaps as many as nine, layers at **Albenga**. Often the layers were intercalated, but at Los **Ullastres** they appear to have been stacked one on top of the other; they were not normally padded or wedged in place. At La Garoupe A, the amphoras were loaded above the dolia, and at Dramont E slender amphoras (*spatheia*) were placed between larger, fatter ones; in several cases the lading of the amphoras shows how the hold was successively filled towards the centre. Some cargoes (e.g. **Camarina A**) as preserved did not fill the ship, but it is usually impossible to determine whether there had once been a perishable consignment to top it up.

Forty-four wreck sites have produced ballast, whose use was evidently understood from the Bronze Age on (see **Sheytan Deresi** and **Ulu Burun**). This was usually boulders, pebbles, beachrock or clay; sand, too, contrary to what one might expect under water, has been identified as at least a component of the ballast at La **Madrague de Giens** and **Procchio**, a reminder that *saburra*, sand, is the Latin term for ballast. Most of the ballast which has been studied seems to have been collected fresh from the shore, rather than loaded from a ballast-pile, and can shed light on the route followed by the ship, as at **Chretienne H** and **Binisafuller**. **Cap Negret** and **Cavalière** are just two of the sites where ballast took the place of either the whole or a part of the ship's load, and the **Procchio** ship, it is said, required ballast to be trimmed properly. Heavy goods, such as the lead ingots of **Sud-Lavezzi B**, would naturally be loaded carefully at the bottom of the hold, to help trim the ship, but metal ballast is not found in antiquity. At **Kyrenia** a collection of grinding-stones were laid along one side of the ship's centre-line, to compensate the asymmetry of the hull, but this has not been observed at other sites. Part-cargoes of 'paying ballast', goods such as pottery which were not worth carrying on their own, are scarce: where complementary or space-filler consignments can be precisely located on board a wreck, they are on top or at one end of the main cargo, as at La **Madrague de Giens**.

## **Rigging, anchors and shipboard equipment**

How did ancient ships, especially the very large ones, manage for rigging? They did not have many of the strong metal fittings of modern sailing ships, and their top hamper must have been considerable (Carre, 1983). The blocks were inefficient, and the anchors heavy - yet all the evidence (from personal possessions, etc., found on board) is of crews numbering only four, five, six or so. Not much trace has been found of the davits and bitts which will have been necessary to manipulate anchors, especially the heavy stone anchors of the Middle Bronze Age (Frost, 1982). The multiple stone anchors found at sites such as **Hishuley Carmel** and **Kefar Shamir** indicate the labour involved in mooring if the alternative, a line of small anchors, were adopted. The development of the wooden anchor, first stone-stocked, then lead-stocked, is quite well documented from wrecks; only 13 sites (of a wide range of date) have produced stone or stone-stocked anchors, but lead stocks have been found in or beside no fewer than 92 wrecks, predominantly of the 3rd century BC-1st century AD, but with a few later examples (cf. Les **Laurons C & D**). Iron anchors are documented from the 3rd century BC on (cf. **Secca di Capistello**) and were normal in the late Roman-Byzantine period, being recorded altogether from 58 wrecks, this lower number reflecting (no doubt) both the date range of find sites and also the likelihood that ships needed to carry more lead-stocked than iron anchors. Only 26 sounding leads have been reported (all from Hellenistic or Roman shipwrecks), suggesting that not all ships carried one.

Tiles, as might have been used to roof a deckhouse, have been reported from only 54 sites; they seem to have been used at either the bow or the stern, occasionally both, ends of the vessel, and in some instances were almost certainly not a roof or deckhead but a cooking hearth (cf. **Plemirio B**). Pottery, both cooking ware, coarseware and fine tableware, was in widespread use (255 sites, all periods), but metal utensils (71 sites, Roman-medieval) and glassware (33 sites) were also used on board. The evidence of well-preserved sites such as **Valle Ponti** is that wooden utensils were in use more commonly than the recorded finds suggest (16 sites). Some stone vessels were used for food preparation (15 sites, predominantly 2nd-1st centuries BC), and 45 wrecks had grinding stones, usually in a pair. Amphoras (not part of the cargo) have come from 100 sites: sometimes certainly to hold sauce, wine or resin for shipboard use, they must often also have been fresh water containers, because there is practically no other evidence for drinking water storage aboard ancient ships.

Tools, sometimes an impressive basket-full (as at **Dramont D**), were carried on at least 49 wrecked ships; they were evidently mostly for odd jobs and repairs on board, like the rolls of lead, etc., recorded at 21 wreck sites. Fishing was obviously a normal activity on board, with tackle (mostly small weights and hooks) reported from 29 wrecks. Some kind of furniture has been found aboard 18 ships, and at least a few appear to have been quite elegantly fitted out, possibly for their owner's use (cf. **Ognina A**). Jewellery or other treasure is rarely found. The relatively large number of lamps reported (70 wrecks) suggests that there was some social life after dark when in port, anyway; counters - hard to find, of course - have come from only eight wrecks, and this must mean that reckoning on a chequer board was not common practice on ancient commercial ships.

Finds of weapons and armour in wrecks are relatively common. In late

Republican Roman wrecks they could have been for defence against pirates; however, two Augustan, three 1st-century AD and two 2nd century AD wrecks have produced weapons, in a period when piracy had officially been eliminated. Perhaps soldiers sailed as guards of state property or military supplies, but the overall number of Roman wrecks with weapons or armour (20) scarcely offers grounds for thinking that. No doubt the weapons were private property, or for use by watchmen in port.

The balances and weights to be found on board might provide evidence for shipboard trading, but only 14 Roman ships which have produced weights or balances (compared with 4 pre-Roman and 3 Byzantine or medieval - so a rather low proportion), and of those 6 have large weights (50, 100 or 300 lbs) and/or a steelyard, appropriate to weighing trade goods, whereas the rest have either not been reported in detail, or have only small weights which could have been part of someone's personal equipment. Coins, contrary to common opinion, are not infrequently found in ancient ships. In the Byzantine period most sites produce coins (cf. **Yassi Ada A**), and at least one coin has been reported from as many as 73 Roman wrecks. However, coinage was apparently not often carried on board for trading purposes, for, of the Roman wreck hoards, four are mast-step deposits, four are very likely the personal cash of a crewman or passenger, four are in a cargo of scrap-metal, and in 23 cases there are only one or two coins (at **Valle Ponti**, for example, despite the fine preservation of this wreck). Even at **St Peter Port** (43 coins) and **Port-Vendres A** (68 coins) the number found would not go a long way to paying a crew or engaging in trade. It is only at **Le Scole**, **Vignale** and **Grand Bassin D** that worthwhile quantities of cash have been found, and the implication is that shipboard trading, as opposed to conveying commissioned cargoes, became more frequent in the late Empire period.

A good deal of other information about the diet and habits of ancient seamen and passengers can be found from the bones, seeds and nuts recovered from wrecks, and from individual details of finds, which are mentioned in the Catalogue of Wrecks, below.

## CHAPTER 5

### Amphoras

The characteristic cargo of Mediterranean shipwrecks, both in fact and in popular imagination, consisted of amphoras. The 'jerry-cans of antiquity', these transport containers made of coarse pottery were used throughout the region from the Bronze Age till modern times. Despite their common occurrence, it is only in recent years that many types of amphora have been satisfactorily recognized and identified by archaeologists. This advance has been partly in response to so many amphoras' being found in shipwrecks; other factors have been the discovery and publication of kiln sites, and the exact recording of the shape and fabric of amphoras. These advances have been explained by Peacock & Williams (1986), Empereur & Garlan (1987) and Empereur & Hesnard (1987).

The taxonomy of amphoras is not like that of living species, for their shape and method of manufacture are not determined by any natural process resembling genetic selection; rather, they remain the individual products of artisans who may work quite independently. Even within a single shipwreck cargo, composed of amphoras of a single form, probably made in the same area or even the same pottery, there can be wide variation of profile and size. To identify a cargo as of 'Type N' or 'Form Y' may therefore be difficult, and even misleading. On the other hand, there are certain broad divisions of form, which are widely recognised by archaeologists and divers, such as the Dressel 20 amphoras of southern Spain; forms such as these are definitely attributable to a certain region and to a broad period of time, and have been used, wherever appropriate, in the description of cargo amphoras in this book. In other cases, however, such convenient descriptive terms are not available, and deliberately vague phrases (e.g. 'ovoidal', 'pear-shaped') have been used instead. This is not only due to uncertainty of categorization: often only a single photograph of one amphora has been published, which makes it impossible to decide what was the overall nature of the cargo. Moreover, since the precise identification of an amphora can depend on its measurements, on the detailed way it was made, or on the constituents of its fabric, nothing less than a full description and accurate drawing is really enough to make a judgement.

For Roman amphoras, an excellent series of illustrations will be found in the study of amphoras from Ostia by Panella (1974), and a fairly comprehensive series, with fabric descriptions and other information, has been published in a convenient form by Peacock & Williams (1986). Greek amphoras have been summarized by Grace (1961), Punic by Pascual (1974, refining the 1950 typology of Mañá), Phoenician, etc., by Zemer (1977) and late Roman by Keay (1984); see also the important papers of Empereur *et al.* already cited. The amphora forms illustrated in **Figures 15-19** are to be taken as supplementary to the illustrations of Roman amphoras published by Peacock & Williams, and in this way it is hoped that the reader will be able to establish the meaning of the amphora descriptions given in the cargo sections of the Catalogue. These descriptions are a mixture of descriptive terms (e.g. 'ovoidal'), typological attributions (e.g. 'Pascual 1'), geographical attributions (e.g. 'Africana') and references to excavated specimens (e.g. 'Kingsholm 117'); a concordance and a full bibliography for Roman amphora names are given by Peacock & Williams.

An amphora is principally categorized by its **form** (e.g. 'Dressel 1', or

'Graeco-Italic'); next, by **type** (e.g. 'Dressel 1B', or 'Will Type D'); lastly, by **variety** (e.g. the several varieties of Dressel 1B found in the wrecks of **Dramont A** and **La Madrague de Giens**). Amphoras were normally made up of several sections, whether hand-built or thrown or a combination of both techniques, which were finally joined together before drying and firing; the main sections were the **bottom**, the **body**, and the **neck** and **rim**. The bottom comprised the tapering **base** section and either a pointed **foot** or a stand-ring; the body tapered at its upper end into the **shoulder**, which was often formed in one with the neck; the rim served to finish off and strengthen the top part, and could have a **lip** to make it easier to pour or to seal the amphora. The assembling of these parts, and their measurable proportions, are important elements of identification and attribution (as well shown by Laubenheimer, 1985), but the exact recording and illustration of such information is again something which is all too often lacking in accounts of shipwreck sites.

For reasons which are still unknown, amphoras do not for the most part exhibit the typological progression which is characteristic of fineware and which makes possible the close archaeological dating of such pottery; on the contrary, an amphora form typically remains much the same for the whole time it is produced, but is then succeeded by a quite new form, but made of the same clay in the same region. Moreover, Roman amphoras often imitated forms made elsewhere (though Greek amphoras, at least of the Classical period, tended to emphasize their distinctive origin), so that minor changes in shape may reflect not the passage of time, but the opening up of new production areas. This leads to uncertainty such as that concerning the Italian Dressel 1 amphoras: Dr. 1A amphoras pre-dated Dr. 1B amphoras, but were also made contemporaneously with them; Dr. 1B amphoras were made in some kilns which opened up for the purpose, but also at kilns which had been in use for Dr. 1A amphoras as well. It follows that the dating of a wreck which has no recorded finds other than a single form of amphora can be very uncertain. There are also some specific problems of dating, due partly to the fact that amphoras, more than fineware, tend to be found in residual contexts on land, but were brand new when lost in a shipwreck, so that a shipwreck date, established from coins or fineware, may be earlier than land finds of the cargo amphoras would suggest; there are also some gaps in the comparative record, for example in the Greek world around 300 BC (for which see Koehler, 1979: 21), which means that there is still considerable uncertainty about the chronology of Graeco-Italic amphoras in the late 4th and 3rd centuries BC (for which see Will, 1982 & 1987, Manacorda, 1986, and Empereur & Hesnard, 1987). For the present, the earliest common types of Graeco-Italic amphora (Will A) have been placed in the period c. 300-250 BC, the later ones (cf. Will D) c. 200-150 BC, though really (even allowing for the possible effects of the two Punic Wars) one might not expect any wide discontinuity, and more evidence will certainly emerge in due course to clarify the question. Anyway, the argument has lately swung back to a relatively early date for the earlier wreck at **Le Grand Congloué** (q.v.), which in turn seems to question the rather late dates given for some Dr. 1A and 1B cargoes by Will (1987) and Long (1987c), and, indeed, for production of those types in general by Peacock & Williams (1986); on the contrary, the dating of black-gloss pottery by Morel (1965, 1981), the evidence of dated inscriptions on amphoras (Miró, 1986) and the stratigraphy of Carthage (Lancel *et al.*, 1982: 27) seem to me to combine with other considerations cited by Empereur & Hesnard (1987) to affirm that Graeco-Italic amphoras ceased to be exported c. 150 BC and were immediately

supplanted by Dr. 1A, with the first Dr. 1B appearing c. 100 BC. From this it can be seen that the basis of dating the very numerous shipwrecks known which contain these amphoras is not only inexact but also subject to controversy and eventual change. In many cases I have had to assign dates to wrecks quite schematically, using parameters with which some authorities would disagree; one can only repeat that the only solution is for divers and archaeologists to recover and publish more and better information about their discoveries.

Similarly schematic chronologies have been adopted for other forms of amphora, in the many instances where no absolute dating evidence has been reported. Thus, Pascual 1 cargoes have been placed in the period c. 50 BC-AD 25, pear-shaped amphoras of Gaulish type c. AD 50-250, and Beltrán 4B amphoras c. AD 30-190 where there is no other evidence for the date; such rough-and-ready dating, with such a wide range of date, is far from ideal, of course. The problem is acute in the case of the Late Roman cylindrical amphoras (corresponding to the Italian 'Contentitori cilindrici della tarda età imperiale' of Manacorda, 1977a). This is the term used for the tall, slender amphoras, often with trumpet lip, characteristic of the 4th and part of the 5th centuries AD; although Manacorda distinguished several types, it seems that at present no relationship can be defined between type and date or origin. The form must have emerged in the last years of the 3rd century AD, but it seems no well-dated deposits of this period are known. This only emphasizes the difficulty of distinguishing the cylindrical amphoras from their predecessors, the rather fatter amphoras of form Africana 2B-D: Manacorda proposes the width of the amphora as the criterion (cylindrical: 29 cm or less), but this would make one of his examples of Africana 2D (p 257 fig 17) in fact a cylindrical amphora; likewise, the amphoras similar to his figure 167, found at **Femina Morta** and **Cap Blanc**, differ from Africana 2D essentially only in the shape of the toe, which is often missing. The effect of such uncertainty is to make the dating of many late Roman wrecks much wider than one would like, in unhappy contrast with the rather exact chronology obtainable at the same period from coins, for example.

The forms illustrated by Dressel, nos 7-11, are really types of a single form which many students now call Dressel 7-11. There is one type, which to some extent resembles Dressel's Form 8, which has a distinctive shape and fabric: this has become widely known as Camulodunum 186 (Peacock & Williams: 120-1). The sausage-shaped amphora with a collar-rim, Haltern 70, has also been separated from Dr. 7-11, especially on grounds of fabric (Peacock & Williams: 115-6). Within the broad grouping of Dr. 7-11, one may call 'Dr. 7' amphoras which resemble Peacock & Williams fig. 50 A, and 'Dr. 9' amphoras like **Figure 16.6**. Some Dr. 7-11 amphoras may in fact have originated not in Baetica but in Tarraconensis. I have not distinguished another Baetican type, Schoene (or Pompeii) 7, from Beltrán 2A, contra Colls et al. (1977).

### Concordance of amphora names

Persian	<b>Fig. 15.1</b>
Loop-handle	<b>Fig. 15.2</b>
Etruscan	<b>Fig. 15.3</b>
Punic: Mañá A	<b>Fig. 15.4</b>
Punic: Mañá B	<b>Fig. 15.5</b>
Punic: Mañá C (Dr. 18)	Peacock & Williams: fig. 77
Punic: Mañá D	<b>Fig. 15.6</b>
Punic: Mañá E	<b>Fig. 15.7</b>
Massiliot	<b>Fig. 16.1</b>
Coan	<b>Fig. 16.2</b>
Corinthian B	<b>Fig. 16.3</b>
Corinthian A	<b>Fig. 16.4</b>
Rhodian	<b>Fig. 16.8</b>
Graeco-Italic: Will type A	<b>Fig. 16.5</b>
Graeco-Italic: Will type D	Peacock & Williams: fig. 24
Graeco-Italic: cf. Will type D/E	<b>Fig. 16.6</b>
Dr. 1A	Peacock & Williams: fig. 26
Dr. 1, Entremont type	<b>Fig. 16.7</b>
Dr. 1B	Peacock & Williams: fig. 28
Dr. 1C	Peacock & Williams: fig. 29
Spheroidal (cf. Panella 2)	Peacock & Williams: fig. 22
Ovoidal (Dr. 26)	<b>Fig. 17.1</b>
Ovoidal (cf. Lamboglia 2)	<b>Fig. 17.2</b>
Lamboglia 2	Peacock & Williams: fig. 34 A
Dr. 6A	Peacock & Williams: fig. 34 B
Dr. 6B	Peacock & Williams: fig. 34 C
Dr. 2-4 (Italian type)	Peacock & Williams: fig. 39 left
Dr. 2-4 (Campanian type)	<b>Fig. 17.3</b>
Dr. 2-4 (Spanish type)	<b>Fig. 17.4</b>
Dr. 2-4 (Greek (?) type)	<b>Fig. 17.5</b>
Dr. 7-11	Peacock & Williams: 117-9
Dr. 7	Peacock & Williams: fig. 50 A
Dr. 9	<b>Fig. 17.6</b>
Camulodunum 186	Peacock & Williams: fig. 52
Dr. 12	Peacock & Williams: fig. 46
Dr. 14	Peacock & Williams: fig. 56
Haltern 70	Peacock & Williams: fig. 48
Beltrán 2B	Peacock & Williams: fig. 55
Beltrán 2A	Peacock & Williams: fig. 54
Beltrán 4B	Peacock & Williams: fig. 58
Dr. 20	Peacock & Williams: figs 65-7
Dr. 28	Peacock & Williams: fig. 75
Richborough 527	Peacock & Williams: fig. 44
Dr. 21-22	Peacock & Williams: fig. 32
Dr. 17	<b>Fig. 17.7</b>
Ibizan	<b>Fig. 17.8</b>
Rhodian (Roman type)	Peacock & Williams: fig. 37
Riley MR 4 (Panella 34)	<b>Fig. 18.1</b>
Panella 36	Panella, 1974: no. 36
Horn-handled (Riley no. D 108)	<b>Fig. 18.2</b>
Kingsholm 117	<b>Fig. 18.3</b>

Pearshape, Gaulish type (Laubenheimer G 1, 3, 4 & 5)	Peacock & Williams: figs 70-74
Pearshape, Mauretanian type	<b>Fig. 18.4</b>
Tripolitanian	Peacock & Williams: fig. 85
Africana 1	Peacock & Williams: fig. 79
Africana 2A & 2B-D	Peacock & Williams: fig. 81
'Spatheion'	Peacock & Williams: fig. 120
Almagro 50	Peacock & Williams: fig. 60
Almagro 51A	<b>Fig. 18.5</b>
Almagro 51C	Peacock & Williams: fig. 62
Dr. 23	Peacock & Williams: fig. 69
Beltrán 72	<b>Fig. 18.6</b>
Kapitän 1	Peacock & Williams: fig. 129
Kapitän 2	Peacock & Williams: fig. 112
Pearshape, Italian type (Panella 41)	Peacock & Williams: fig. 99
Panella 44-47	Peacock & Williams: fig. 93
Late Roman cylindrical	<b>Fig. 18.7</b>
Late Roman, Femmina Morta type	<b>Fig. 18.8</b>
Keay 25	<b>Fig. 19.1</b>
Keay 35	<b>Fig. 19.2</b>
Keay 62	<b>Fig. 19.3</b>
Gaza	Peacock & Williams: fig. 116
Byzantine, globular	Peacock & Williams: fig. 101
Byzantine, baluster-shape	Peacock & Williams: fig. 104



## CHAPTER 6

### Glossary of technical terms

For amphora names (e.g. 'Almagro 50') see Chapter 5.

amphora	pottery transport container of large size
anchor-stock	cross-piece of an anchor which makes it lie flat on the seabed
askos	flattened flask
barrilete	cask-shaped pot
bitts	upright timbers for making fast cables or catting anchors
black-gloss	black glaze or 'vernis noir', e.g. 'Campanian' ware
black-rim	cooking pottery in red fabric with grey (reduced) rim or side
block	pulley or sheave: a rigging fitting which serves to guide or change direction of a rope
brail-ring	ring (of rope, wood or metal) sewn to the forward face of a sail as a guide to the brails
brails	lines which enable the foot of a sail to be raised or lowered, thus adjusting its geometry or reducing resistance to the wind
bucchero	dark grey Etruscan pottery
bulkhead	internal transverse partition
Camp.	Campanian pottery type: see Lamboglia
Campanian ware	black-gloss pottery (cf. Morel (1965 & 1981), or, for a brief guide, DRASM (1985) 49)
carinated	of kinked, as opposed to curved, profile
cathead	timber protruding outboard on which an anchor may be hung (catted)
ceiling, ceiling planks	planking laid fore-and-aft over the frames to form a lining for the hold
cleat	small peg or bar used to secure a rope
CMS	Centre for Maritime Studies, University of Haifa
crown	of an anchor: the pointed end, where the shank meets the arms
CSAS	Centro Sperimentale dell'Archeologia Subacquea
davit	projecting timber with a roller or pulley, used for hoisting and lowering heavy items outboard
dead-eye	fitting to join ropes, usually part of the shrouds
dolium (pl. dolia)	large pottery jar for fermentation or storage of wine
dowel	cylinder or rod shaped piece of wood, cf. treenail
Dr.	Dressel (see Chapter 5)
Drag.	Dragendorff
DRASM	Direction des Recherches Archéologiques Sous-Marines
dugout	boat or utensil made from a hollowed-out log
dunnage	material placed underneath cargo to protect the ceiling
floor	structural timber placed across the bottom of a ship
fluke-tip	protective cap at the end of the arm of an anchor
frame	structural timber placed against the bottom and side of a ship; usually comprises two half-frames, set one on

	either side of the keel
garboard strake	the first strake, attached to the keel; in ancient ships, often extra thick and of complex profile
grain-rubber	a pair of rectangular grinding stones, or one stone thereof
gunwale	wale at top of the ship's side
guttus	spouted juglet, possibly for filling lamps
IJNA	International Journal of Nautical Archaeology
imbrex	curved roof-tile, normally used to cover the adjoining edges of two flat tiles
Isings	Isings, C. <u>Roman Glass from Dated Finds</u> (Groningen, 1957)
keelson	longitudinal timber placed above the keel, not normally a feature of ancient ships; cf. mast-step
lagynos	Hellenistic wine jug
Lamboglia	Lamboglia, N., Per una classificazione preliminare della ceramica campana. <u>Atti del I Congresso Internazionale di Studi Liguri</u> (Bordighera, 1952) 143-55. (For Lamboglia's amphora typology, see Chapter 5).
louterion (pl. -a)	shallow basin of marble or baked clay, with a pedestal, found in Greek shipwrecks and possibly used for rituals on board
mast-partners	beams which support and hold in position the lower part of a mast
mast-step	heavy timber, carved to receive the foot of the mast, which rests above the keel; long mast-steps may resemble keelsons
matte	mass of sea-grass
mill-stones	grinding stones: usually in this book, one or both stones ( <u>meta</u> and <u>catillus</u> ) of a rotary hand-mill
mortice-and-tenon	joint used in most ancient ships: mortices (slots) were cut in the edge of planks to receive tenons (tongue-shaped pieces of wood), which positioned the two joining timbers and could be locked tight with treenails
oinochoe	wine jug
pelike	jar
pithos (pl. pithoi)	large jar, Greek equivalent of the Roman <u>dōlium</u>
rabbet (rebate)	groove or cutting, e.g. in the keel, into which an adjoining timber can be lodged
reinforcement collar	lead component of some wooden anchors, fitted by casting around the shank and the arms near where they meet; probably usually a repair
rilled ware	casseroles, etc., similar to black-rim ware
ring	of an anchor: the end of the shank to which is attached the anchor chain or cable
scarf	joint (without making the structure thicker)
sea-grass	underwater growth (usually <u>Posidonia</u> ) with rhizomes which trap sand and in time build up a thick matte
sennit	lashing or stitch used to assemble or repair part of a ship
shank	the central, straight component of a wood or iron anchor

sheave	see block
shipwreck	a site (usually in the sea) where the remains of an ancient vessel and her cargo can be identified (cf. 'wreck')
shrouds	ropes which support the mast
signature	mark or sign made by a potter on a damp tile or other pottery object
site	a place investigated by archaeologists
situla	bucket-shaped bronze vessel
sombrero de copa	Iberian painted pot, shaped like an opera hat
stanchion	upright timber within the ship, usually supporting a beam
stock	the crosswise component of an anchor
strake	longitudinal plank forming the hull
tegula	flanged, flat roof-tile
tenon	see mortice-and-tenon
terra sigillata	red-gloss pottery (whether plain or decorated), sometimes called 'Samian' or 'Red Slip' ware
treenail	dowel or peg used to fasten timbers, whether small (planking treenail) or large (assembly or framing treenail)
t.s. chiara	red-gloss pottery of mid-late Roman Imperial date, usually of N. African origin ('African R.S.')
t.s. hispanica	red-gloss pottery of Spanish origin
tumulus	a mound, usually made up of amphoras and encrustation, formed by the wreck of an ancient ship
unguentarium (pl. unguentaria)	small flask of pottery or glass
'vaulting tubes'	small pottery pipes which fit together to form lengths of tubing; used in Roman buildings, but also part of some Roman ships' equipment
wale	a thick strake, giving the hull planking reinforcement and protection
wreck	a site (usually in the sea) where an ancient vessel was sunk or severely damaged; also, short for 'shipwreck'
yard	wooden pole to which a sail is attached and which is hoisted up a mast by halyards or lifts





Linder & Ramon, 1981; Raban, 1985: 33; personal information.

**'Atlit: grinding-stones wreck**

A cargo of over 60 large mill-stones, found S. of 'Atlit in 9 m of water, 150 m from shore, was thought at first to be of Roman or Byzantine date, but a later reference states they are 'at most several hundred years old'.

Linder, 1967; Raban, 1973.

**ABBEVILLE** 4 Map 15 France

50° 6' N. 1° 51' E. Found in the R. Somme in 1808.

No cargo (?). Roman period.

No details are known of a 'celtic' or 'continental' boat (cf. **Zwammerdam**, etc.) found near Abbeville.

Marsden, 1977: 282.

**ACQUAVIVA** 5 Map 7 Italy

42° 49' N. 10° 16' E. Off the central N. coast of Elba. Depth: approx. 30 m.

Amphoras. 2nd century AD ?

A buried Roman wreck with pear-shaped amphoras scattered on the site has been briefly reported.

Zecchini, 1971: 182-3; 1982: 175 ('a wreck cannot be ruled out').

**ACQUE CHIARE** 6 Map 10 Italy

40° 40' N. 17° 56' E. Near Torre Rossa (Brindisi); 300-400 m off-shore. Depth: 5-6 m.

Amphoras. c. AD 300-450 (?).

A poorly preserved, looted site represents a cargo of cylindrical amphoras (cf. Keay 25). There were also at least four terracotta 'vaulting tubes', but it is not known whether these were part of a cargo consignment. The remains of the wreck extend some 50 metres.

Sciarra, 1973; Freschi, 1989: 455.

Information: G. Kapitän.

For another wreck in this area see **Lido di Sant'Anna**.

**ADDAYA**

7

Map 3

Spain

40° 1' N. 4° 12' E. On the W. side of s'Illa Gran d'Addaya (Minorca); on a reef at the entrance to the harbour of Addaya. Depth: 2-5 m.

Amphoras.

Mid 2nd-late 1st century BC.

A densely-heaped deposit of amphoras, many broken. Though they are said to have been of different types, both photos and published comments indicate they were mostly of form Dr. 1.

Mascaró, 1961; 1971: 74, fig. 7.

Aeolian Islands: see **Basiluzzo, Capo Graziano, Dattilo, Filicudi Porto, Panarea, Pignataro di Fuori, Punta di San Francesco, Secca del Bagno, Secca di Capistello, Vulcano.**

**AGAY**

8

Map 5

France

43° 25' N. 6° 52' E. In Agay bay; alternative name, Camp Long. Depth: 40-45 m.

Amphoras and other cargo.

Mid 10th century AD.

The wreck 'des jarres' off Agay comprises a cargo ship, 20-25 m long and at least 7 m in beam, together with her boat, 8-10 m long. In the boat was the skeleton of a man of Mediterranean type with slightly negroid features, 1.70 m tall and aged 25-35 years, with a sword and a cutlass-sheath. The ship carried a great variety of amphoras and jars, of various fabrics and dimensions, with at least one Arabic graffito; some or all of this pottery is thought to come from Spain. As at the contemporary wreck of **Bataiguiet**, some of the jars were very big (1.40 m tall). There was also a consignment of basalt grinding-stones, at least seven in number, and 250 bronze ingots, of slender form, 38-40 cm long. Other items found, including a brass ingot and some copper vessels, may also have been cargo items. Both the ship and the boat were assembled out of short timbers by means of a large number of iron nails. There are no joints in the planking, which is nailed to the frames.

Visquis, 1973; Liou, 1976; Arnaud *et al.*, 1980; Lequément, 1985: 111; Darmoul, 1985; Pomey *et al.*, 1989: 39-40.

Agay: see also **Antheor, Chrétienne.**

**AGDE A**

9

Map 4

France

43° 17' N. 3° 32' E. At Le Môle d'Agde; 30-40 m from the shore. Sometimes referred to as Site B. Depth: 2-3 m.

Amphoras.

c. 200-150 BC ?

A site in shallow water, close to shore, yielded a variety of material; no detailed account of the site or of the finds has been published, and there may have been several wrecks at the site. The most abundant material consisted of amphoras (Bouscaras, fig. 1, right) of a late Graeco-Italic type (cf. Will type D); the red fabric includes augite and leucite, suggesting a central Italian origin.

From the same site came an unspecified number of Dr. 1B amphoras, in two varieties of fabric; all of one variety (Bouscaras, fig. 1, left) were stamped **CAST** and **VLAED**. These amphoras must be at least 100 years later than the Graeco-Italic amphoras; there is no indication in the published reports that they constituted a second cargo.

Camp. B pottery and traces of the ship's timbers were found at a Graeco-Italic wreck, probably this site; an iron anchor, too, may have come from it.

Bouscaras, 1953: 53-5 & pl. 1; 1954 (slightly abridged version of the former); 1962: 11; 1974; cf. Gallia, 22 (1964): 486-8 (finds of other periods, including Etruscan); Fonquerle, 1985: 17. Map of sites in the Agde area: Gallet de Santerre, 1961: 206.

#### **AGDE B**

10

Map 4

France

43° 16' N. 3° 27' E. S. of the W. branch of the R. Hérault, 400 m from the modern coast. Depth: 6-8 m.

Amphoras.

2nd century BC (?).

A quantity of amphoras is spread over a rocky bottom, close to a reef which rises to m below the surface and was doubtless the cause of wreck. The published reports disagree as to their form. Two Dr. 2-4 amphoras and one of Graeco-Italic (cf. Will type E) or Dr. 1 'Entremont' form are illustrated by Bouscaras (1953 & 1954); a Dr. 1C amphora is illustrated, and Rhodian and Dr. 2-4 amphoras referred to, by Jannoray and Gallet de Santerre (followed by Carrazé); a Dr. 1A amphora is illustrated by Bouscaras (1962); a Graeco-Italic wreck, with Camp. B pottery and traces of timbers, is reported briefly by Bouscaras (1974). The Dr. 2-4 amphoras can scarcely be earlier than the mid 1st century BC, but all the rest could possibly be found together in the mid 2nd century BC.

The situation of this wreck is very similar to that of **Marzamemi B, D, G** and **H**; there, underwater mapping showed that several scattered cargoes lay in the same general area of seabed. The same must have been the case at Agde B, but there is insufficient information to attribute any material to a second or third wreck.

Bouscaras, 1953; 1954; 1962: 11 & fig. 5; 1974; Jannoray, 1954: 413; Gallet de Santerre, 1961; Carrazé, 1970d; cf. Clavel, 1970: 409 ff.

#### **Agde C**

A site reported under the name 'Agde C' produced amphoras of many forms, datable from the 4th century BC to the 5th century AD or later. No detailed records of the site appear to have been made. It lies on a rocky area, 7-8 m deep, 500 m from the coast (to the W. of **Agde B**). Finds including pieces of wood strongly suggest that there was at least one ancient wreck here, but at this remove nothing more can be said.



Bouscaras, 1953: 56-7; cf. 1954: 51-4; Gallet de Santerre, 1961: 207-10.

**AGDE D**

11

Map 4

France

43° 15' N. 3° 27' E. Between wrecks B and C, but further offshore; on a rocky shallow. Depth: 6-7 m.

Amphoras.

1st century BC.

A quite well-preserved wreck with several hundred amphoras, all of form Dr. 1C. They were not stamped, but some bore an incised potter's mark. A stopper of cork was sealed with mortar; the seal was impressed with the name **M.STATIVS** (twice) around **S**. Shipboard pottery included a jug in white fabric and sherds of Camp. A and C black-gloss ware, indicating a 1st century BC date. A piece of basalt mill-stone was also found at the site. Parts of the hull survived: oak frames, fir planking (with oak tenons and treenails), and lead sheathing. Remains of rigging included a pulley block (with a scrap of rope) and a piece of a yard. A stone anchor, of trapezoidal shape with three holes, is said to have been found near the wreck. There is no corroborative evidence that such anchors were in use on board 1st century BC merchant ships, and, in view of the situation of the wreck, one may best regard this as a fisherman's lost anchor or weight.

Gallet de Santerre, 1961: 209-11; Liou, 1973: 575-8; 1975: 576; Oleson, 1983: 161-3.

**AGDE E**

12

Map 4

France

43° 15' N. 3° 28' E. Off Rochelongue point, S. of Agde; depth not reported (finds reported under site 'E' of Gallet de Santerre (1962) appear to come from various places).

Amphoras.

Late 1st-early 2nd century AD.

Amphoras of form Dr. 20, one stamped **STRCF** or **STRCT**, were apparently associated with a small, water-worn copper ingot.

The ingot is illustrated by Bouscaras (1964a: fig. 11). In that paper, a number of sites or associations are alluded to, but with no details. Note that the grains of 'tin' (pp. 270-4) have since been identified as lead; they appear to be referred to by Marechal (1987), as belonging to 'the Rochelongue wreck'.

Bouscaras, 1961: 19; Laubenheimer-Leenhardt, 1973: 57.

For the prehistoric wreck, see **Rochelongue**; for lead ingots from Site E, see **Agde K**.

**AGDE F**

13

Map 4

France

43° 16' N. 3° 27' E. Not far from site C; in a broad, sandy gully between rocky areas. Depth: shallow.

Amphoras.

5th century BC ?

The scattered remains of a cargo of Massiliot amphoras was found and planned. Three anchors, of iron with a schist stock, were found nearby; it is hard to accept that these were really associated with the amphoras, which are said to be of the 5th century BC. Several one-letter stamps from the amphoras have been published.

Bouscaras, 1962: 6-11; 1964a: fig. 3.

**AGDE G** 14 Map 4 France

43° 19' N. 3° 33' E. At Marseillan-Plage, in the Étang de Thau; on a sandy bottom. Depth: 7 m.

Litharge. 5th-2nd centuries BC ?

A cargo of tablets of litharge (red lead) lay, stacked together, in a patch 20 x 14 m, representing about 100 tons. The wreck is described as Greek (by Maréchal), but no dating evidence is mentioned.

Gallet de Santerre, 1961: 205; Clavel, 1970: 445-6 (citing research by F. Laubenheimer); Maréchal, 1987.

The wreck of mill-stones, referred to by Bouscaras (1962: 11) as 'Épave G (Meules)', must be **Brescou**.

**AGDE H** 15 Map 4 France

43° 16' N. 3° 27' E. (?). Off Agde; detailed location and depth not reported.

Lead ore. Date: unknown.

A wreck containing galena, along with other unspecified material, has been reported only briefly.

Gallet de Santerre, 1964: 486; Clavel, 1970: 445-6 (citing unpublished research by F. Laubenheimer).

**AGDE J** 16 Map 4 France

43° 19' N. 3° 33' E. Off Marseillan-Plage, E. of Agde; depth not reported.

Lead ingots. Late 2nd-early 1st century BC.

A group of lead ingots of Republican Spanish type came from a looted site near Agde. They bear the mould-marks **L.PLANI.L.F.RVSSINI**, **SOC GARGILI T F ET M LAETILI ML**, and **SOC.M.C.PONTILIENORVM.M.F.** The ingot of L. Planius Russinus is exactly similar to two ingots found in the Mahdia wreck, which dates this site. No other material or information about the site has been published, but there can be little doubt it is a wreck.

Gallet de Santerre, 1966: 464-5; Laubenheimer-Leenhardt, 1973: 134-45 & 178 ff.; Fonquerle, 1982: 128-30.

43° 15' N. 3° 30' E. From 'Site E', between Brescou island and the coast.

Lead ingots.

3rd century BC ?

A group of lead ingots, cast in oval moulds resembling the Pinna nobilis shell, and inscribed Π, are reported without context. Certainly pre-Roman, the date can only be guessed; 3rd century BC seems reasonable, by comparison with the ingots from **Cabrera B.**

Bouscaras, 1960: 29-31; 1961: 17-19; Gallet de Santerre, 1962: 622; Laubenheimer-Leenhardt, 1973: 146-61 & 169-72.

#### **Agde: site D**

On a rocky shelf, 60 m from land, in 8 m depth, lay material of different periods. Besides amphoras, an anchor and a mill-stone, there were a lead ingot (with mould-mark S[ ]MF R[ ]TI and stamp MVS) and a wheel-shaped copper ingot (uninscribed). There is no evidence that these objects belong to one or more wrecks, likely though that might be.

Gallet de Santerre, 1964: 488; Laubenheimer-Leenhardt, 1973: 50-1 & 130-2.

#### **Agde: Baie de l'Amitié**

Three copper ingots, inscribed VIII and of similar composition, were found between Brescou island and the land in 1964; there were no associated finds. One ingot retained part of an impressed cartouche stamp, [ ]JAROAE.

Laubenheimer-Leenhardt, 1973: 42-7.

#### **Agde: Marseillan beach**

A bun-shaped copper ingot, inscribed TELESPHORI AVG N SER, etc., was found in 8 m of water. Nearby were some scattered amphora fragments and two other copper ingots, apparently uninscribed. This site could well be a wreck, but nothing more is known of it. For similar ingots, see **Planier B.**

Laubenheimer-Leenhardt, 1973: 52-5.

#### **Agde: R. Hérault**

Two wrecks, one of the 2nd century BC, the other early 2nd century AD, are said to lie in the Hérault in the centre of Agde (Fonquerle, 1973). These deposits are not corroborated as wrecks in later publications (eg. by Fonquerle, 1985), and may be harbour debris rather than actual wrecks. The Hellenistic male bronze statue found there also appears to be without context (Charbonneau, 1966).

**Agde: other sites**

Besides unassociated finds from the R. Hérault at Agde itself, tantalisingly brief reference is made by Fonquerle (1971) to 25 wrecks or sites discovered near Agde, including five Greek and nine Roman shipwrecks; cf. Fonquerle, 1982; 1985. Some of the material briefly published by Bouscaras (1964a) must have come from shipwrecks, too.

See also **Brescou, Rochelongue, La Tour du Castellas.**

**AGROPOLI** 18 Map 9 Italy

40° 20' N. 14° 58' E. Off Agropoli; detailed location and depth not reported.

Marble. Roman period.

Only a brief reference has been published to this site.

Gianfrotta, 1981a.

Aguilas: see El **Hornillo.**

**AI-YANNIS THOLOU A & B** 19-20 Map 13 Greece

38° 23' N. 26° 7' E. (approx.). Two wrecks found in the bay of AI-Yannis (A. Ioanni Tholou) on the E. side of Khios have been summarily reported. Depth: 10-20 m.

A. Amphoras. 4th century BC Chian amphoras.

B. Amphoras. 2nd century BC Cnidian amphoras.

Catling, 1984-5: 57 (from press reports). There is only a single wreck, with Chian and Cnidian amphoras of the late 5th-early 4th century BC, according to Touchais, 1985: 831.

**AIGUA BLAVA** 21 Map 4 Spain

41° 56' N. 3° 13' E. Near Aigua Blava; not far from the coast. Depth: 6-7 m.

Amphoras. c. 50 BC-AD 25 (?).

A concentrated deposit of broken amphoras off Aigua Blava contains Pascual 1 amphoras, together with other amphoras said to be form Dr. 37 (not a well-defined form, but normally late Imperial). It is not clear whether there is a wreck here at all, let alone whether there is one (with contamination) or two; however, nothing suggests that Aigua Blava was a port in antiquity, or that the amphora site was an anchorage.

Unpublished.

Information: F. Foerster.

**AIN EL GAZALA** 22 Map 1 Libya

32° 9' N. 23° 20' E. Off Ain el Gazala, near Tobruk; detailed location and depth unknown.

Amphoras. 3rd or 4th century AD.

A group of Kapitän 2 amphoras in Cyrene Museum came from a wreck off Ain el Gazala, according to an unconfirmed report.

Panella, 1974: 597.

Information: J.A. Riley.

**AJACCIO** 23 Map 6 France

41° 55' N. 8° 44' E. (approx.). Near Ajaccio (Corsica); detailed location and depth not known.

Pottery. 15th-16th centuries AD.

About 1960, some divers came across the remains of a ship laden with various goods, including pottery decorated a stecca ('ribbed'). The pots which have been studied are yellow or green glazed ware, imitating products of Pisa, found commonly in Liguria (and less frequently in Corsica).

Démians d'Archimbaud, 1972: 13-4.

**AKANDIA A** 24 Map 13 Greece

36° 26' N. 28° 15' E. Said to be 550 m NE. of Akandia bay, which is SE. of the port of Rhodes. Depth: 36 m.

Amphoras. c. 50 BC-AD 100.

A Swedish expedition surveyed this well-preserved wreck in 1974, when about 270 amphoras were still visible, covering an area 15 x 11 m on the sandy bottom. The amphoras were of Roman Rhodian form; both full-size and half-size amphoras were present (capacity approx. 22 and 11 litres). No other finds were reported. The site had already been looted.

Nikolitsis, 1981: 45-7.

**AKANDIA B** 25 Map 13 Greece

36° 26' N. 28° 15' E. Approx. 70 m W. of wreck A. Depth: 38 m.

Amphoras. Date unknown.

A second cargo of amphoras was found near the first by the Swedish expedition of 1974. No detailed survey was possible, and the amphoras are described as 'a new type of transport-amphora'.

Nikolitsis, 1981: 49.

**AKKO A** 26 Map 14 Israel

32° 57' N. 35° 4' E. (approx.). North of Akko (Acre); no details reported.

Cargo unknown. Hellenistic period.

A Hellenistic wreck is known to lie N. of Acre.

Unpublished.

Information: M. Prausnitz.

**AKKO B** 27 Map 14 Israel

32° 57' N. 35° 4' E. (approx.). N. of Akko (Acre); no details reported.

Grinding stones. 2nd-1st centuries BC ?

A Hellenistic or Roman cargo of millstones lies N. of Acre.

Unpublished.

Information: M. Prausnitz.

### **Akrotiri (Cyprus)**

Hellenistic finds from the sea off Akrotiri are not, despite early suggestions, from a wreck.

Report of the Director of the Department of Antiquities of Cyprus, 1977:  
44.

Information: K. Nicolaou.

**ALBENGA** 28 Map 7 Italy

44° 3' N. 8° 15' E. About 1 km E. of Albenga; on a level mud bottom. Depth: 40-42 m.

Amphoras and pottery. 100-80 BC.

The wreck, long known to fishermen, was first investigated with salvage equipment (including a grab, used to dig a trench across the site) in 1950. Successive campaigns, directed by N. Lamboglia, took place from 1957 until the

early 1970s. The wreck consisted of a tumulus, up to 2 m high, 30 x 10 m in extent, which was almost completely uncreted. The site lies between the old and the present mouths of a river whose sediments make the water dark and have created the soft bottom on to which the ship settled, almost upright. Whatever is buried in the silt (which includes one side of the hull as well as its bottom) is perfectly preserved.

Over 1,200 amphoras have been raised. The main cargo was of Dr. 1B amphoras, of which four types have been published; none was stamped, and apparently no tituli picti have been found. The amphoras were stopped with a cork disc, above which (in some cases) a pine-cone had been pushed into the mouth. An early report refers to a clay sealing over the pine-cone, but Dirole (1954) specifically says that none was sealed with the mortar sealing found in similar wrecks elsewhere. Three amphoras contained hazelnuts, and others (apparently) cereal, but the main contents must have been wine, as is implied by the 'red paste' said to have been found in the bottom of many of them. There were also a number of Lam. 2 amphoras - no statistics are given, and there may have been only three or four, for shipboard use. These were originally thought to be for olive oil, as a complementary cargo to the Dr. 1 wine amphoras, but all the evidence there is for the contents of Lam. 2 amphoras in general indicates that they held wine (cf. **Madrague de Giens**; there seems no justification for the view of Will (1987: 204) that this identification is either mistaken or untypical of the form). A variety of pottery was recovered. Black-gloss ware, including Camp. A plates and 'imitation Campanian' bowls, was present in unstated quantity, but some is said to have been stacked between the cargo amphoras, and must therefore have been cargo, too. The amphoras were wedged in place with pumice stone, instead of the brushwood found in other wrecks.

Pottery for use on board included (besides black-gloss plates and jugs) grey ware, cooking ware, and jugs with an external slip, coated with a black lining internally. Other finds included a handful of roof-tile fragments, a lead horn, and seven bronze helmets of different types. The helmets were found above the cargo, and must therefore have been in use on the voyage (either by the crew, for defence against pirates, or worn by soldiers) or part of some passenger's baggage.

The ship's structure is well preserved. The frames are of oak, the planking (lead-sheathed) of soft-wood. Lead pipes were found, but without direct evidence of their function. The main-mast survives in position (whereas in most ancient wrecks it has been wrenched out when the ship sank); it is square as far as the main-beam, and circular above. The mast-box area of the main-beam is also preserved, and it appears that the ship was not decked at this point. All sources agree that this was a large ship, but the estimated size of the cargo varies. Nine layers of amphoras were reported by Lamboglia (1973) and shown in a restored section drawing (Pallarés, 1977a: 32-3); however, only six layers can be seen in a schematic restoration by Pallarés (reproduced by D'Angelo, 1980), and Ferrandi (1980) says there were only five. The estimated number of amphoras on board varies accordingly; 5,000 (Ferrandi), 10,000 (Lamboglia, 1973) or 11,000 to 13,500 (Tchernia & Pomey, 1978, based on a load of 'at least five layers'). The last estimate, made with the benefit of experience of the Madrague de Giens excavation, must be the most authoritative; it implies a potential burden of 500 to 600 tonnes. However, pending more detailed study and publication of the Albenga ship, such a figure must be provisional. Unfortunately, looting and damage of this important and well-preserved ship have continued over the years, and a full-scale excavation of the remaining cargo and the hull are more than ever desirable.

Taylor, 1965: 53-66 (with references); Lamboglia, 1961a; 1964a; 1972b: 447; 1973; Tchernia & Pomey, 1978; D'Angelo, 1980: 53-4; Ferrandi, 1980; Gianfrotta, 1981b: 236; Morel, 1981: 64; Pallarés, 1977a; 1985d.

Albenga: see also **Gallinaria**.

Alberti: see **Panarea**.

**ALBLASSERDAM** 29 Map 15 Netherlands

51° 52' N. 4° 40' E. Found close to buildings of the Roman period.

No cargo. c. AD 100-250 (?).

A dugout, 2.33 m long, was found in association with pottery of the 2nd-mid 3rd centuries AD.

Sarfatij et al., 1974: 234.

### **Albufereta, La (Spain)**

A Roman ship is said to have been investigated in the Albufereta of Alicante in 1934.

Ripoll, 1961a: 21.

**ALCUDIA** 30 Map 3 Spain

39° 46' N. 3° 10' E. (approx.). Off C'an Picafort, NE. Majorca; detailed location and depth not reported.

Tin ingots. Date unknown.

Little is known of the date or the ingots found off Alcudia. 'A considerable quantity' is said to have been found. About 30 cm tall, with a hole near the top, and weighing 10½-11½ kg, the ingots could have been Roman. A jeweller found that they were slightly alloyed with silver.

Mascaró, 1962; 1968; 1971: 81-4.

**ALEXANDRIA A** 31 Map 1 Egypt

31° 13' N. 29° 55' E. (approx.). On a rocky bottom near Alexandria. Depth not reported.

Amphoras. Roman period.

A shipwreck somewhere near the Pharos had numerous amphoras; to judge by a photo, these were Dr. 6 (1st century AD), but certain identification is not possible.

Vailati & Curto, 1980: 53.



**ALEXANDRIA B**

32

Map 1

Egypt

31° 13' N. 29° 55' E. (approx.). On a rocky bottom near Alexandria. Depth not reported.

Grinding stones.

Date unknown.

A cargo of mill-stones, presumably ancient, is shown in a photo, without further description.

Vailati & Curto, 1980: 53.

**ALGAJOLA**

33

Map 6

France

42° 37' N. 8° 50' E. At Algajola rocks (Corsica); a widely spread site. Depth: 12-27 m.

Lead ingots.

c. 150-100 BC (?).

Over an area 200 m in extent, scattered material includes 44 lead ingots (uninscribed), six anchor-stocks and a few Dr. 1A amphoras.

Liou, 1973: 606.

**ALGHERO**

34

Map 6

Italy

40° 32' N. 8° 17' E. Detailed location and depth not reported.

Tiles.

Roman period.

Only a press report has been published of a sunken Roman ship with a cargo of bricks.

Zucca, 1980: 39, note 33 (citing L'Unione Sarda, 25.8.78 [not seen]).

Alghero: see also **Lazzaretto**.

**ALMADRABA, LA**

35

Map 1

Spain

38° 52' N. 0° 1' E. Near Denia; detailed location and depth not reported.

Amphoras.

2nd century AD.

A wreck with Dr. 2-4 amphoras, said to be of the 2nd century AD, has been briefly reported.

Fernández Izquierdo, 1984/5.

Almazora: see **Benafelí**.

### **Almuñécar (Spain)**

A possible wreck of Dr. 1C amphoras at La Veintiuna has been summarily reported.

Molina, 1983: 331.

For other sites near Almuñécar, see **Cueva del Jarro**, **Punta de la Mona** and **Las Puntas**.

### **AMETLLA DE MAR A**

**36**

Map 1

Spain

40° 52' N. 0° 48' E. 1 km from La Ametlla de Mar; on the reef of El Carreró del Mig. Depth: 30 m.

Amphoras.

c. 25 BC-AD 75.

The site is variously located in published reports, but must be some distance from the shore since it has been damaged by fishing trawls. The main cargo is of Dr. 12 amphoras, similar to those of **Titan**; Dr. 2-4 amphoras, too, were attributed to the site by Oliva & Domenech, but these were not mentioned by M. Walfida (in charge of the site for Tarragona Museum) in conversation with the writer. No dating evidence or other details of the wreck have been reported.

Vilaseca, 1954; 1958: 237; Oliva & Domenech, 1971.

Information: M. Walfida Pérez.

### **AMETLLA DE MAR B**

**37**

Map 1

Spain

40° 55' N. 0° 50' E. (approx.). Between Ametlla de Mar and Reus; in Cala de Don Bacó, close to one side of the cove. Depth: 6-7 m.

Amphoras.

c. 300-250 BC (?).

A large deposit of Graeco-Italic amphoras lay buried in sand; no other information has been published. The amphoras are of Will's type A1; they were stopped with corks.

Vilaseca, 1958.

### **AMETLLA DE MAR C**

**38**

Map 1

Spain

40° 53' N. 0° 48' E. (approx.). Detailed location and depth not known.

Amphoras.

1st-later 3rd centuries AD.

A wreck with very broken-up Dr. 20 amphoras is known to lie off Ametlla de Mar, but no details of the material or the site have been reported.

Unpublished.

Information: R. Pascual.

**AMOLADERAS, LAS** 39 Map 2 Spain

37° 43' N. 0° 42' W. (approx.). N. of Cabo de Palos (Almería); depth not reported.

Lead objects. Roman period.

A cargo of lead products included pipes of Roman type, elbows, assembly-pieces, ornaments, and 200 sling-shots. There were also some tokens (tesserae) with Iberian inscriptions, said to be paralleled by finds in the Sierra Morena. Other finds included Dr. 1A amphoras, tiles, mill-stones, and a phallic pendant of gold.

Más, 1977; 1985a: 162-4.

**ANCENIS** 40 Map 15 France

47° 23' N. 1° 10' W. 2nd-3rd century AD (?).

A dugout was dated to the Roman period by C<sub>14</sub> (ad 130±150).

McGrail, 1978: 111.

For other Roman dugouts, see **Bevaix NE 1917, Chaudeney-sur-Moselle, Cudrefin, Hardham, Mainz, Monate, Pommeroeul, Portomaggiore, Sanguinet, Valle Isola & Zwammerdam.**

**ANCONA** 41 Map 8 Italy

43° 37' N. 13° 30' E. Off Ancona dockyard; in shallow water.

Amphoras. c. 150-25 BC (?).

Exploration by a local diving group in 1967 produced material including groups of amphora fragments which could be the remains of a wreck. The amphoras (not illustrated in the report) are of 'Apulian type', presumably Lam. 2.

Profumo, 1986.

Ancona: see also **Palombina Vecchia.**

Anse de la Salis: see **Pointe Bacon.**

**ANTALYA** 42 Map 1 Turkey

36° 40' N. 31° 20' E. (approx.). In Antalya Bay, near the mouth of R. Manavgat; detailed location and depth not known.

Copper ingots. 15th century BC (?).

Unconfirmed reports from sponge divers indicate that there may be as many as four copper ingot wrecks in the area; one of these (like that at **Kimi**) seems to be earlier than **Cape Gelidonya A**, perhaps 15th century BC.

Bass, 1966: 87; Throckmorton, 1970a: 217-9.

**ANTHÉOR** 43 Map 5 France

43° 25' N. 6° 53' E. (?). Off Anthéor; detailed location and depth not reported.

Pottery. 15th-16th centuries AD.

A wreck with glazed ware, similar to that at **Ajaccio**, was discovered prior to 1960, in unknown circumstances.

Démians d'Archimbaud, 1972, 13.

Anthéor: see also La **Chrétienne**.

#### **Antibes, Anse Saint-Roch (France)**

Large quantities of coins (4th and 17th centuries), amphoras, Roman lead seals, copper nails, wood fragments, and other finds were cast indiscriminately ashore during dredging in the landlocked haven of Antibes. From the W. side (Clergues, Point 21) came 2nd century AD and earlier material; from the centre (Point 22) came mainly 4th century AD material, and also ship fragments. Subsequent investigation under water, however, failed to find traces of a substantive shipwreck, and the timbers submitted for examination were dated by C<sub>14</sub> to modern times. Excavation of other sites has shown that coherent remains of both ships and cargoes may well be found in ancient ports; however, in such circumstances only detailed archaeological recording (such as was impossible at Antibes) can establish associations of material.

Benoit, 1952b: 255-6; 1956: 34; Tchernia, 1970: 244; Clergues, 1972a; 1972b; 1973; Rogers, 1979. 'Wrecks' described by Violino (1986) appear to be derived from Clergues.

Antibes: see also **Cap d'Antibes**, **Cap Gros**, **La Garoupe** and **Pointe Bacon**.

**ANTIKYTHERA A** 44 Map 13 Greece

35° 52' N. 23° 20' E. By the treacherous rocks on the NE. side of Antikythera (Andikithira). Depth: 50-60 m.

Amphoras, pottery, glass, works of art, etc.  
80 BC or a little later.

Discovered in 1900, the wreck was the target of one of the earliest underwater excavations. The works of art on board included not only contemporary pieces but also 'old masters' of the 4th-2nd centuries BC. The amphoras include Rhodian, Coan and Lam. 2 forms. There was a considerable quantity of pottery, both fine ware and coarseware, and glass vessels, especially cast-and-ground bowls, some of millefiori glass. 'Treasure', too, was found (in a further exploration by J-Y. Cousteau in 1976) - gold bars and piles of coins, embedded in clay (as well as a necklace, a ring, and other jewels). Much material from the wreck has still not been studied - this includes ingots and lead weights, as well as anchors and items of rigging. Part of the hull, raised in the early excavations, has been studied: it was strongly constructed, and sheathed in lead. Substantial hull remains were uncovered in 1976.

The date of the wreck is fixed by an astronomical computer, a mechanical device which could be used to predict the night sky; study of its remains showed that it must have been set in 80 BC, the only date which fits both the astronomical situation and also the archaeological date for the site. The 1976 excavations apparently uncovered some coins of Pergamum, dating from 88-86 BC. This strongly suggests that the ship was carrying an instalment of the reparations exacted from the city of Pergamum after the Mithridatic War, when both public monuments and private houses had to be stripped of their treasures in order to meet the Roman demands for payment.

Weinberg *et al.*, 1965 (citing earlier publications); Bol, 1972; Frost, 1963: 128; cf. Taylor, 1965: 35-9; Throckmorton, 1970a.

Information: H. Hauser; P. Nicolaides.

**ANTIKYTHERA B** 45 Map 13 Greece

35° 52' N. 23° 20' E. Near wreck A; depth not reported.

Amphoras. 1st century BC-5th century AD ?

Divers visiting wreck A discovered a second wreck a few hundred metres away. The cargo was of large amphoras, 'like barrels'; nearby lay the lead stock and reinforcement collar of an anchor.

Dumas, 1972: 71.

**ANZIO** 46 Map 9 Italy

41° 25' N. 12° 35' E. (approx.). Near Anzio; depth not reported.

Stone. Date uncertain.

A cargo of tufa blocks (presumably ancient) has been summarily reported.

Gianfrotta & Pomey, 1981: 222.

**APOLLONIA A** 47 Map 1 Libya

32° 52' N. 21° 59' E. In the ancient harbour of Apollonia; near the channel between the W. and E. basins. Depth: 8 m.

No cargo. c. 150-120 BC.

A 1986 survey of the harbour revealed an abandoned vessel, dated by two bronze coins to the 2nd century BC. Other finds include a small jar filled with pitch, a sort of funnel made from the top of an amphora, and pottery including a black-gloss cup with the Greek graffito Herakleides. Details of the ship include a circular lead patch, apparently applied over a delicate place in the hull, a sounding lead, and some bronze rings (thought to be sail rings). The ship was not large, though built with closely-set planking tenons, and was probably of local origin, since she was mostly of fir and Aleppo pine, with a frame of walnut, and treenails of deciduous and evergreen oak.

Laronde, 1987.

**APOLLONIA B** 48 Map 1 Libya

32° 52' N. 21° 59' E. Near wreck A. Depth: 8 m.

Pottery and amphoras. c. 180-150 BC.

A wrecked cargo, apparently without any surviving hull remains, was found in the 1986 survey. The main cargo was made up of Megarian bowls, from the 'Atelier de Menemakhos' (eastern Aegean), together with Rhodian amphoras stamped Drakontida and Aristōnos.

Further material from the harbour, including an early Imperial collection of bronze furniture and sculpture, does not appear to represent a shipwreck.

Laronde, 1987.

**ARAGNON** 49 Map 4 France

43° 19' N. 5° 4' E. Near Aragnon island (E. of Cap Couronne); lying partly on shore.

Amphoras. c. AD 1-50 (?).

The site of this wreck is not exactly known. The amphoras were of form Dr. 6; they were sealed with terracotta stoppers, made of the same clay as the amphoras, which bore signs (eg. trident) and were fixed in place with pitch, their button side down. A flat-bottomed amphora (probably made at Marseilles) and a large jug were also found.

For another Dr. 6 wreck in this area, see **Fos B**.

Carraze, 1970e; 1976a: 71-2, fig. 5; Pomey et al., 1989: 25-6.

**ARAP ADASI** 50 Map 13 Turkey

36° 39' N. 28° 8' E. Near Arap Adasi, SW. of Marmaris. Depth: 83-100 m.

Amphoras.

1st century BC (?).

In 1953, sponge-draggers found an early 3rd-century BC bronze statue of a standing woman, popularly but incorrectly identified as Demeter. Fragments of bronze and wood were said to have been found at the same position. Searches of the area by G. Bass in 1965-8 located a large wreck in deep water; television pictures showed amphoras, perhaps Rhodian of the 1st century BC to judge from a published photo. There is no certainty that the bronze came from this wreck.

Bass, 1966: 82-3; Ridgeway, 1967; Bass & Fernald, 1971; Bass & Joline, 1968/9; Bass & Katzev, 1968; Rosencrantz et al., 1972: fig. 139 & pl. 142.

Arbatax: see **Capo Bellavista**.

**ARDENZA**

51

Map 7

Italy

43° 30' N. 10° 18' E. At 'Tre Ponti', near Ardenza. Depth: 10-11 m.

Amphoras.

1st century AD.

Many amphoras of form Dr. 14 were found at the site, which covered an area 20 x 10 m. Considerable remains of the ship were also present. The site has been completely looted and only fragmentary amphoras are known.

Monaco, 1971; Romualdi, A., in Martelli et al., 1982: 55-6.

**ARENAS, IS**

52

Map 6

Italy

39° 45' N. 8° 31' E. (approx.). Close to the beach of Is Arenas, near San Vito Milis (Sardinia); buried in sand.

Amphoras.

4th-2nd centuries BC ?

A preliminary notice has been published of a wreck with Punic amphoras (of unstated type), surveyed by an Israeli expedition in 1984. The ship's hull apparently measures 20 x 6 m.

Gianfrotta, 1985a.

**ARENELLA**

53

Map 11

Italy

36° 59' N. 15° 17' E. Between Contrada Fanusa and Arenella, S. of Syracuse (Sicily). Depth: 4-5 m.

Armour and weapons (?).

Medieval period.

Only summary information is available of a medieval wreck containing numerous iron weapons and armour, discovered in 1984. Finds include an iron anchor.

Information: G. Kapitän (from a press report); A. Freschi.

### **Arenys de Mar (Spain)**

A Pascual 1 amphora from off Arenys de Mar may have come from a wreck, but nothing is known of the site.

Miró, 1982: 25, no. 1; cf. Liou, 1987b: 271.

### **AREOPOLIS** 54 Map 1 Greece

36° 40' N. 22° 22' E. At Areopolis, in the Mani; on a steep slope near a reef in the harbour entrance. Depth: 6-14 m.

Amphoras. 1st century BC (?).

A rather scattered cargo of Lam. 2 amphoras was of substantial size, suggesting a ship 30 m long. There were some small-finds, but no timbers survived.

Frost, F., 1968.

Information: F. Frost.

See also **Limeni**.

### **ARGENTARIO** 55 Map 7 Italy

42° 25' N. 11° 5' E. Two miles off Cala Grande, on the W. side of Monte Argentario (Tuscany); detailed location and depth not reported.

Dolia. Roman period.

Three dolia were found off Cala Grande in 1973; two, unstamped, were raised. No other material is known from the site, but it must be a wreck.

Rendini, P., in Martelli et al., 1982: 43; Gianfrotta & Hesnard, 1987: 291.

### **ARLES-RHÔNE** 56 Map 4 France

43° 37' N. 4° 40' E. In the river-bed of R. Rhone, close to the city of Arles. Depth: 8-10 m.

Amphoras. 1st century AD.

Broken amphoras of Gaulish form (Pélichet 47) were found under gravel in 1986, and may represent a wreck.

Pomey et al., 1989: 8.



**ARTEMISION**

57

Map 13

Greece

39° 2' N. 23° 18' E. Off Cape Artemision (N. Euboea); 600 m offshore. Depth: 35 m.

Works of art. c. 200-80 BC.

First discovered in the 1920s, the site has produced the 5th century male statue (probably Zeus) and the 2nd century BC horse and boy jockey group. Apparently a considerable quantity of pottery was raised, too; two cups and a lamp, published recently, lie in the date-range 2nd-early 1st century BC (perhaps in the period c. 148-146 BC, though this cannot be pressed). Early accounts mention a lead anchor-stock and grinding-stones, and the preserved finds include a stone pestle. The ship's timbers are also said to exist in situ. It would be of obvious interest to make a thorough investigation of the site with modern techniques, even if (as must be feared) most of the portable finds have been looted.

Kallipolitis, 1972; Wünsche, 1979 (with references to earlier reports).

**ARWAD A**

58

Map 1

Syria

34° 50' N. 33° 52' E. (approx.). Between two islets in the chain of Arwad (Rouad) reef. Depth: 6 m.

Amphoras. 6th-4th centuries BC.

Two scattered cargoes lie in shallow water; the first is of basket-handle jars, of indeterminate type (cf. Zemer 24).

Frost, 1966: 26-7 & pl.7.

**ARWAD B**

59

Map 1

Syria

34° 50' N. 33° 52' E. (approx.). Near wreck A. Depth: 6 m.

Amphoras. 6th-mid 7th centuries AD (?).

The second of two scattered cargoes on the reef of Arwad consists of rilled, pear-shaped Byzantine amphoras.

Frost, 1966: 26-7 & pl. 8.

**ARWAD C**

60

Map 1

Syria

34° 50' N. 33° 52' E. (approx.). 6 km S. of Arwad. Depth: 20 m.

Stone. Date unknown.

A cargo of 'little black basalt columns', lying on sand, has not been investigated in detail or dated.

Frost, 1964.

**ASHQELON** **61** Map 14 Israel

31° 40' N. 34° 33' E. Detailed location and depth not reported.

Stone. Date unknown.

A brief report has announced what is apparently a shipwrecked cargo of stone, including a life-size porphyry statue in Egyptian style, near Ashqelon.

CMS News, 13 (March, 1986).

**ATALANTI** **62** Map 13 Greece

38° 25' N. 26° 15' E. (?). In Atalanti Bay, Khios. Depth: 22 m.

Cargo not reported (amphoras ?). 1st century AD.

No details are available of a wreck of the 1st century AD with a lead anchor-stock.

Touchais, 1985: 831.

Atlit: see 'Atlit (above).

**AVENCHES** **63** Map 15 Switzerland

46° 53' N. 7° 3' E. Near Avenches; in what is now dry land, 400 m S. of Lake Morat.

No cargo. 2nd century AD (?).

Roman Aventicum had a busy port, first built in AD 5; later, a canal was constructed, but this was abandoned by the end of the 2nd century AD. Three fragments of boats have been found in excavations at or near the Roman canal; all show traces of caulking, and one has large iron nails. They are datable to the end of the 1st century BC, post AD 45, and post AD 125 by tree-ring dating; all were probably abandoned in the 2nd century.

Bügli, 1974; Bonnet, 1982.

**AVERNO A, B, C & D** **64-67** Map 9 Italy

40° 47' N. 14° 4' E. (approx.). In Lake Avernus, off the Temple of Apollo. Depth: 25-35 m.

Amphoras. Roman period.

Four heaps of Roman amphoras are thought to represent shipwrecks in Lake Avernus.

Toja, 1991.

**AYIA GALINI**

**68**

Map 13

Greece

35° 5' N. 24° 40' E. Off Ayia (Agia) Galini at the W. end of Mesara plain (Crete); 200 m from shore. Depth: 5 m.

Works of art and other cargo. c. AD 276-290.

A considerable variety of bronze statue fragments and statuettes were recovered, together with other finds, by a fisherman in 1937 and by archaeologically directed operations in 1938-9, 1955 and 1960. Weights of bronze (filled with lead) and of brass, lamps, a portable altar, rings, locks, tools, and various handles and feet from bronze vessels suggest a collection of second-hand goods or scrap metal. The wreck is dated by a hoard of 259 coins, closing with Probus (AD 276-282). No wood was found, but a piece of lead, apparently hull sheathing, appears to confirm that the site is a shipwreck. Some shipboard pottery was also discovered, and an amphora with a mid-3rd century parallel (Robinson, 1959, no. P 21330).

The date of the wreck has suggested that the ship could have been carrying loot collected by the Goths who attacked Greece at this period. However, one may note that miscellaneous metal objects formed whole or part cargoes at various periods (cf. **Plemmirio A** or **Favaritx**), and even in the Roman period the notion of a 'bronze worker's hoard' (Sanders) cannot be ruled out.

Theophanidis, 1949; Leatham & Hood, 1958-9; Hood & Warren, 1966: 169; Sanders, 1982: 165.

**AYIOS GEORGHIOS**

**69**

Map 1

Cyprus

34° 53' N. 32° 18' E. On the west coast of Cyprus, not far from the shore. Depth: shallow.

Amphoras. Date unknown.

A deposit of broken amphoras indicates an ancient wreck cargo. The amphoras have not been identified or dated.

Giangrande et al., 1987: 192.

**AYIOS IOANNIS THEOLOGOS**

**70**

Map 13

Greece

38° 39' N. 23° 11' E. (?). In Phthiotis; 750 m off a rocky coast. Depth: 20 m.

Amphoras. 11th century AD.

A wreck of Byzantine amphoras, form Günsenin 2, lies in sand. Numerous amphoras can be seen, both lying free and buried in the sand; two Y-shaped iron anchors lie among the amphoras.

Kazianes et al., 1990: 228-31.

**AYIOS STEPHANOS**

71

Map 13

Greece

38° 28' N. 26° 9' E. In NE. Khios; site A of the Garnett & Boardman survey, to SE. of the islet. Depth: 3-4 m.

Amphoras.

Mid 6th-mid 7th centuries AD (?).

A dense mass of broken amphoras was made up of Byzantine amphoras of several types including Riley LR1 and some resembling Zemer (1977) fig. 58. The concreted sherds covered an area 24 x 12 m, and must have represented over 1,000 amphoras. The sherds retain a resinous lining.

Garnett & Boardman, 1961: 107-112, nos 23-6 & pl. 17b.

**AYITAŞI BURNU**

72

Map 13

Turkey

40° 35' N. 27° 30' E. At Ayitaşı Burun, on the SW. side of Marmara; 30m from shore. Depth: 14-17 m.

Amphoras.

Mid 4th century BC (?).

A looted site was located by an INA survey. Some Byzantine and other forms of amphora were found, but a 'predominant group' of Chian amphoras represents a Classical wreck.

Pulak, 1985a (site 7); 1985c (site 5). Smith (1987: 3) may refer to this site.

**BACOLI A, B, C**

73-75

Map 9

Italy

40° 47' N. 14° 5' E. Three wrecks lie in 32 m and 35-37 m of water, NE. of Bacoli (near Pozzuoli). No detailed investigation has been reported.

A. Amphoras.

c. 50 BC-AD 100.

Several thousand Dr. 2-4 amphoras, type uncertain, lay on the frames and planking of the ship's hull. The site has been much looted.

B. Amphoras.

2nd century AD ?.

Amphoras, possibly of Dr. 20 form, lie scattered on a steep slope.

C. Amphoras.

Mostly fragmentary amphoras, possibly of classical date and maybe Cnidian.

Paget, 1971 (wrecks A & B).

Information: R.F. Paget.

**BAGAUD A**

76

Map 5

France

43° 1' N. 6° 22' E. At Bagaud island (Îles d'Hyères); on the slope to NE. or N. of the island. Depth: 15 m.

Amphoras. c. AD 200-275 ?

The amphora debris which lay behind Bagaud island was recognized by Benoit as possibly the remains of scattered shipwrecks. Amphoras of forms Kapitån 1 and 2 and of pear-shaped form (cf. Dr. 30), as well as late Roman 'spatheia' and at least two mortaria, have been reported. Joncheray refers to amphoras with bifid handles, which perhaps represents a further form. The most likely date for a wreck with Kapitån 1 and 2 and Dr. 30 amphoras is 3rd century AD; by this period pottery mortaria are rare, but 'spatheia' have not begun to be made. Doubtless more than one ship was wrecked here, but at this stage it is not possible to identify the various deposits.

Benoit, 1958: 37; 1962: 169; Joncheray, 1972a: 25 & 33; Parker & Squire, 1974: 31. Since this entry was written, an investigation by the DRASM has established that the pear-shaped amphoras represent a wreck of the late 1st or 2nd century AD (Pomey et al., 1989: 30); whether there are further wrecks remains uncertain.

**BAGAUD B**

77

Map 5

France

43° 1' N. 6° 22' E. 'Bagaud 2', on the N. side of the island. Depth: 18 m.

Tin and iron ingots. c. 110-100 BC.

Excavation by the DRASM in 1980-1 revealed that this ship carried 5-10 tonnes of iron bars, together with some tin ingots. A block of concretion was raised; it contained, as well as ingots, Dr. 1A amphoras, Camp. B pottery, fishing-weights, coarseware, and hull timbers. The handle of a bronze dagger and a small coin of Massilia were also found. The iron bars, some worked to a point, other more ingot-like, weighed up to 2 or 3 kg. 47 tin ingots were recovered, of five types: most were round or oval, a few irregular or loaf-shaped, and four were of truncated pyramid form. Their average weight was 30 kg, and their diameter or length 25-40 cm. They were stamped; the most frequent stamp, applied two or three times to the flat face, showed Hermes, with the legend (in Greek) hypo keltōn peri herakleid. An abbreviated version, tōnpēra is found on the other side of many; and, on the truncated pyramid ingots only, appears the mark aistor. The ingots were counterstamped with a variety of anepigraphic marks. The reference to Celts (or 'Hypocelts'), and the role of Herakleides, are unclear, though a link with the coin-issuing city of Celti in southern Spain seems probable, especially if aistor is Aistryia, the Greek name for an estuary near Huelva. Study of the mineralized timbers preserved in concretion revealed that the ship was lightly built, and must have been not more than 12-15 m long.

Pomey, 1983: 26; DRASM, 1983: nos 18, 151, 253-6; Long, 1985; 1987d.

Information: M. L'Hour.

**BAGAUD C**

78

Map 5

France

43° 1' N. 6° 22' E. SE. of Pointe Montrémian. Depth: 12-19 m.

Amphoras. Late 1st-2nd centuries AD.

A wreck with a cargo of Gaulish amphoras and a small Dr. 20 amphora has been briefly reported.

Pomey et al., 1989: 30.

**BAIA DI GADIR** 79 Map 11 Italy

36° 48' N. 12° 2' E. Off Pantelleria island; on a bottom sloping down to 40 m deep.

Amphoras. c. 150-50 BC ?

Only a brief report has been published of a wreck with Punic and Roman amphoras, pottery and several lead anchor-stocks.

Gandolfi, 1985b: 660.

See also **Cala Gadir, Cala Levante, Pantelleria and Punta Pozzolana.**

Baia di Saturo: see **Saturo.**

**BAIE DE L'AMITIÉ** 80 Map 4 France

43° 16' N. 3° 28' E. Near Agde, in sand near shore. Depth: 2-4 m.

Amphoras and lead ingots. c. AD 50-100.

A load of Dr. 20 amphoras occupied an area 9.5 x 4 m; one handle (rescued from looting) is stamped **LCM**. Three metres away was a consignment of 98 lead ingots, total weight 2.8 tonnes. The ingots were irregular in shape and weight; all were decorated with moulded motifs (shell, bars, incuse V, or gorgon), but none bore any inscription. Also found was a substantial quantity of coarse cooking pots, Italian and South Gaulish t.s., and a balsamarium: some of the pottery may have been cargo. Packing material of straw, and some small cages of vegetable fibre, were also found, as well as remains of the hull.

Pomey et al., 1989: 4.

**BAJO DE DENTRO** 81 Map 2 Spain

37° 38' N. 0° 40' W. At 'Bajo de Dentro', on Cabo de Palos. Depth not reported.

Lead ingots. 1st century BC (?).

Over a ton of inscribed lead ingots has been raised from the wreck, but little other information has been published. The mould-marks on the ingots include **M.AQVINI.C.F**, **C.MESSI.L.F**, **C.VTIVS.C.F**, **M.SEX.CALVI.M.F** and

**L. PLANI. L. F. RVSSINI.** Apparently there are no counterstamps or incised marks. The total number of recorded ingots appears to be 49 (of which 15 were published by Domergue). A Lam. 2 amphora and some anchor stocks were found near the ingots.

Domergue, 1966b (nos 1-10, 12-13, 29-30); 1984: 209; Más, 1972: 73-4; 1977; 1985a: 162-3.

**BAJO DE LA BARRA** 82 Map 2 Spain

37° 39' N. 0° 40' W. At 'Bajo de la Barra', between San Pedro del Pinatar and Cabo de Palos. Detailed location and depth not reported.

Amphoras, etc. 1st century AD.

A wreck with a cargo of Baetican amphoras (Beltran 1) and unguentaria, with some coarseware, has been briefly reported.

Más, 1985a: 164.

**BAJO DE LA CAMPANA A** 83 Map 2 Spain

37° 44' N. 0° 42' W. (approx.). Close to Isla Grosa, opposite to and not far from La Manga del Mar Menor; the site has been much disturbed by salvage of modern wrecks in the vicinity. Depth not reported.

Amphoras, ivory, tin and lead. 5th-4th century BC ?

The main cargo of this wreck is said to have comprised amphoras of Mañá type E; according to Guerrero (1986), these cannot pre-date the 2nd century BC. Also found were a number of elephant tusks, inscribed in Phoenician script characteristic of the 5th or 4th century BC (Sanmartín, 1986), and other amphoras, plates and tripod-plates of the 7th century or earlier. Unstated quantities of lentoid tin ingots, 'fusiform' lead ingots, and lead ore, were also found. Unfortunately, insufficient detail of the site has been given to clarify the nature and extent of contamination, which might enable the identification of two or more wreck cargoes.

The 13 tusks are inscribed bd'štrt ('of Bd'strt'), bd'štrt 'bd ('of Bd'štrt, yours sincerely'), r'mlk 'nš ('R'mlk; humbly') and m', short for a name such as Mlqrtšm' (a Punic rather than Phoenician name). They evidently form a group, and provide a glimpse of Phoenician merchants at work. It is most unfortunate that it is not possible to associate this material with other finds, or the remains of the ship.

Más, 1972: 71-2; 1978; 1985a: 155-61; Blánquez, 1982: 58 & 61; Sanmartín, 1986.

**BAJO DE LA CAMPANA B** 84 Map 2 Spain

37° 44' N. 0° 42' W. (approx.). Close to (and partly overlying) wreck A; depth not reported.

Amphoras. 1st century AD (?).

A cargo of Baetican amphoras partly overlay the Punic cargo of wreck A. The amphoras are said to be Dr. 14, though a published illustration shows a Beltrán 2B (Más, 1985a: fig. 6.3), and an ovoidal amphora said to be from Cabo de Palos (Más, 1972: 71-2) may be from this wreck, too. Manufactured objects of lead and lead ore, referred to in an earlier account, doubtless belong to wreck A.

Más, 1972: 71-2; 1978; 1985a: 164-5.

**BALISE DU PRÊTRE A, B, C**                      **85-87**                      Map 6                      France

41° 21' N. 9° 12' E. To the W. of Le Prêtre beacon, Bonifacio Strait. Depth: 17 m.

A. Amphoras.                                      c. 200-140 BC (?).

B. Amphoras.                                      1st century AD (?).

C. Amphoras.                                      c. AD 290-340 (?).

Material found at the 'cimetière marin' of the Balise du Prêtre includes identifiable groups of amphoras of three periods. The earliest, which are recorded as lying below other material, are Graeco-Italic amphoras, Will type E, and perhaps a Mañá C amphora (Bebko, 1971, nos 1-5 & 8). Another group, datable in the 1st century AD, includes Dr. 2-4 amphoras, probably of Spanish origin, and possibly Dr. 21 amphoras as well (Bebko, nos 6, 7, 11, and possibly 15); some mortaria and other pottery may belong with this group. Also to be associated with this material, in all probability, are two copper ingots, apparently uninscribed (Laubenheimer-Leenhardt, 1973: 32-5). The third group, of late Roman amphoras (Bebko, nos 10, 12, 13, 14, 16 and probably 9), is a cargo generally comparable with **Femina Morta** and some other early 4th century wrecks.

Even though no detailed site records were made, it was clear to Bebko (though not to others) that the remains of at least three shipwrecks could be recognized here. The confusion of sites in the Strait of Bonifacio reflects imperfect information, not an indiscriminate jumble of material on the sea-bed.

Benoit, 1956: fig. 2. 22; 1958: 39; Bebko, 1971: 2-12; Parker, 1981b: 314-7.

**BANDOL**                                      **88**                                      Map 5                                      France

43° 6' N. 5° 45' E. One mile SW. of La Fourmigue beacon, Bandol. Depth: 40 m.

Amphoras.                                      c. 200-140 BC (?).

A wreck with Graeco-Italic amphoras, Will type E, was discovered in 1965; no material apart from an amphora has been published.

Tchernia, 1969: 482-3.

Bara: see **Berã**.



**BARATTI****89**

Map 7

Italy

43° 0' N. 10° 30' E. (approx.). In the N. part of Baratti bay, Populonia; beneath the so-called 'Villa del Barone'. Depth: 7-8 m.

Amphoras. c. 150-25 BC (?).

A concreted cargo of Dr. 1 amphoras had been damaged by looters, who removed the heads of the amphoras; no other finds have been reported.

Romualdi, A., in Martelli et al., 1982: 54, site b.

Baratti: for Baratti wreck 'A', see **Populonia**; 'B', see **Il Pozzino**; 'C', see **Cala del Piccione**.

**Baratti: other sites**

An iron anchor, encrusted with fragments of Dr. 1 amphoras, from the N. part of the gulf of Baratti, doubtless represents a wreck, but may be from a site already listed (Romualdi, A., in Martelli et al., 1982: 54, site g).

Fragments of dolia and amphoras, reported from a 1957 survey, have been thought to represent a wreck (Olschki & Marinelli, 1961; Tchernia, 1986: 138; Gianfrotta & Hesnard, 1987: 291); however, subsequent survey of the bay indicates that these remains in fact belong to a submerged building (McCann et al., 1977: 286).

A late Roman silver vase has also been found; this has been published (by Arias, 1986), but without any mention of a context.

**BARBAROSSA****90**

Map 7

Italy

42° 45' N. 10° 24' E. Off Barbarossa beach, E. of Porto Azzurro (Elba). Depth: 25-30 m.

Amphoras. c. 250-150 BC (?).

Finds off Barbarossa beach include Graeco-Italic amphoras which indicate a probable wreck.

Zecchini, 1971: 183 (not naming as a wreck); Pallarés, 1983b: 184-5, no. 50.

**BARBATE****91**

Map 2

Spain

36° 11' N. 5° 55' W. Off Bolonia, near Barbate de Franco; detailed location and depth not reported.

Amphoras. Roman period.

Some amphoras from a Roman ship are briefly reported to have been recovered.

Balil, 1973-4.

Bardia: see **Marsa Lucch.**

**BARI** 92 Map 1 Italy

41° 8' N. 16° 50' E. (?). Said to lie off the Basilica of San Nicola, Bari; depth not reported.

Amphoras (?). Date unknown.

A wreck has been summarily reported, without any detail of date or cargo, off Bari.

De Juliis, 1984: 124; repeated by Volpe, 1987: 290.

**BASILUZZO** 93 Map 11 Italy

38° 39' N. 15° 6' E. (approx.). In deep water near Basiluzzo (Aeolian Islands); detailed location unknown.

Amphoras. Medieval period (?).

Known only from a diver's report, this wreck had a cargo of pear-shaped amphoras, with a short neck to which small, round handles were attached at both top and bottom. Such a description would suit various forms of 10th-13th century amphora.

Bernabò-Brea & Cavalier, 1985: 77.

**BAŠKA** 94 Map 8 Croatia

44° 58' N. 14° 46' E. At Baska, on Krk island; on a steep underwater cliff. Depth: main concentration, 16-19 m.

Amphoras. 1st century BC (?).

Twenty-eight amphoras of form Lam. 2 were recovered. One is stamped **ONESIMI M.** Also found were some glossy brown colour-coated jugs. No remains of the ship survived.

Vrsalović, 1974: 240, no.3; Matajčić, 1968.

Information: R. Matajčić (Lipari, 1976)

**BASSE DU VERHUGE, LA** 95 Map 5 France

43° 14' N. 6° 44' E. Near Cap de St Tropez; S. of Le Verhugue, on a gentle slope. Depth: 100 m.

Amphoras. c. 140-130 BC (?).

A tumulus of amphoras, 25 m long, was found in 1970; it appears to be intact apart from some damage by fishing nets. The amphoras appear to be Transitional from Graeco-Italic to Dr. 1, as at **Pointe du Brouil**.

Pomey et al., 1989: 44.

**BASSES DU CAN, LES** 96 Map 5 France

43° 14' N. 6° 42' E. SE. of Cap de St Tropez, not far from La **Basse du Verhugue**. Depth: 80-87 m.

Amphoras. Late 2nd century BC.

A fairly coherent wreck in deep water had already been looted when it was discovered by a submersible working on a coral conservation project. The site was surveyed and sampled by L. Long, using a manned submersible. The cargo was of Dr. 1A amphoras, apparently from Campania; several were stamped with a one- or two-letter stamp. Cork stoppers (but no sealings) were found, and part of two coarseware vessels; no trace of the ship's hull was seen.

Long, 1988.

**BATAIGUIER, LE** 97 Map 5 France

43° 31' N. 7° 1' E. In Cannes bay; W. of Le Bataiguier (or Batéguiier) beacon, approx. 500 m NW. of Île Sainte Marguerite. Depth: 54-55 m.

Amphoras, pottery, lamps and other cargo.  
Mid 10th century AD.

A wreck extending 24 x 11 m had been damaged by trawling when found; the composition of the cargo is thus not entirely certain, but included jugs, flasks, strainer-jars, jars, cups, saucepans with pierced covers, and Arab jars, some as much as 1.3 m tall and 1 m in diameter. There were also consignments of lamps of two types; the lamps probably came from Cordova, and enable the wreck to be dated c. AD 950. There were also fragments of copper cauldrons, bowls, a lamp-filler in the form of a dromedary, a drum and glass vessels. Some of the pottery bears Arabic graffiti.

The ship's hull (preserved over 20 x 6 m) appears to have been burnt; some of the pottery is covered with molten pitch. The bones of at least three people were found at the site, of whom two were male adults, one aged about 20 years; a C<sub>14</sub> date in the 7th century has suggested these are not associated with the wreck, but in view of the wreck's location it seems probable that they are some of the crew.

Joncheray, 1974a; 1976c; Liou, 1976; Vindry, 1980; Arnaud et al., 1980; Lequement, 1985: 111; Pollino, 1983: 42-3; DRASM, 1985: 112-3.

### Beaulieu-sur-Mer (France)

A 'Roman amphora ship' mentioned by Fonquerle (1972: 56) does not appear to have been reported elsewhere and must be a doublet of some other site.

### Belle Île (France)

A Dr. 1A amphora was found in a trawl, 20 miles off Belle Île (in the Atlantic); there is no corroborative evidence that this came from a wreck.

André, 1959.

### BEN-AFELÍ

98

Map 1

Spain

39° 57' N. 0° 4' W. Off Ben-Afelí beach, near Almazora; 300-1200 m from the shore. Depth: 5-10 m.

Amphoras, mortaria and iron bars.

c. AD 85-95.

The scattered material lies in an exposed position, but there was a concentration of material, some in concreted masses, at the SW. corner of the site. Here were found some Dr. 2-4 amphoras of Spanish type; amphoras of this form were the most common form on the site, in two fabrics. There were also a quantity of stamped mortaria: several complete specimens and many fragments have been found. A score of iron bars have been recovered, a sample of a much larger consignment in the wreck; some, 30-50 cm long, are flat (one incised or stamped **FERRO**), others (80-95 cm long) are square-sectioned. The mortaria bear stamps **[P]RIMIGE[NIVS] | [DVO]DOM(I)T[IOR.S]** (cf. CIL XV.1.1000c & 2482-3, Domitianic), **STATI(VS).MARC(CIVS) |** (line) | **[PR]IMIGE[NIVS FEC]** (cf. CIL X.2.8048.40, from Stabiae and datable pre AD 79), and **[..]TIAE.VOL[ ] | [PR(?) ]ISCVS.F[E]** (unparalleled). The first and second are probably late Domitianic (cf. Steinby, 1977: 64); the third could well be, too, and the Claudian date proposed by Fernandez is therefore untenable.

Shipboard material which can be assigned to the wreck comprises a billhook and chopper of iron, a sounding-lead, a resin-lined pottery jar, and a roof-tile fragment. Remains of the ship include some small bronze cylinders which must have been part of the pump, lead sheathing, rolls of unused lead for patching, many copper nails, a section of tapering lead pipe, a bronze sheave bearing and a wooden pole (spar?), tipped with bronze. A lead anchor-stock (with a knuckle-bone cast on one arm), found 200 m away, and a heavy iron anchor probably do not belong to the 1st-century wreck, however.

It is unfortunate that the situation of this wreck did not allow better preservation of its interesting cargo.

Wagner, 1978; Fernández, 1983: 173-84; Ramos *et al.*, 1987.

Information: K. Hartley; M. Steinby.

Benat: see **Cap Benat**.

**BENICARLÓ****99**

Map 1

Spain

40° 24' N. 0° 26' E. Close to the small harbour of Benicarló. Depth: 6-10 m.

Amphoras.

c. AD 1-50 (?).

From an area 20-30 m across came some 20 amphoras of form Haltern 70, together with fragments of lead sheathing. In antiquity this could have been a rocky shoreline, the coast having receded; the association of other material with the amphoras is therefore quite uncertain. This material comprises two mill-stones (from different mills), two lead anchor-stocks, two Dr. 2-4 amphoras, a Dr. 20 amphora, and a bronze helmet - though such items might well be found in a 1st century AD Baetican shipwreck (cf. **Cabrera D**). There are also four Graeco-Italic amphoras from the vicinity, which certainly do not belong with the 1st century material. Unfortunately the Haltern 70 amphoras were not raised under archaeological control, so that the difficulty of interpreting such an exposed site is compounded by inadequate site records.

Fernández, 1983: 143-51.

**BERA****100**

Map 4

Spain

41° 7' N. 1° 27' E. Off the Arc de Berà (Bará), near Tarragona; 4 km off-shore. Depth: 50 m.

Amphoras.

Mid 1st century AD (?).

A substantial cargo of Dr. 2-4 amphoras of Tarraconensian type lay in a muddy bottom; the wreck covered at least 12 x 7 m. Some of the amphoras are displayed in Tarragona Museum.

Berges, 1970; Corsi-Sciallano &amp; Liou, 1985: 153; Liou, 1987b: 274.

**BERGEGGI****101**

Map 7

Italy

44° 13' N. 8° 26' E. Close to Bergeggi island (Liguria); between two rocky spurs. The site has been referred to as 'Bergeggi A', but nothing of any second wreck has been reported. Depth: 27-30 m.

Amphoras.

c. AD 10-60 (?).

The remains of an amphora wreck, much damaged by trawling and looting, covered an area 20 x 6 m. The identified amphoras are of form Haltern 70 (Baetican), and thought to be of the Tiberius-Claudius period.

Pallares, 1985c; Gandolfi, 1985b: 658.

**BEVAIX****102**

Map 15

Switzerland

46° 56' N. 6° 49' E. Near the N. side of L. Neuchâtel; discovered by air photography. Depth: 2 m.

No cargo.

c. AD 182-190.

A Roman boat, built in N. European technique, was found in 1970; a steering-oar had been raised from the same area in 1911. The timbers were dated by  $C_{14}$  to AD 90-60, but dendrochronology shows the oaks were felled in AD 182. The boat has been cast in a synthetic resin mixture and reburied in the lake. Its construction was similar to the **Yverdon** boat, and to remains found at **Avenches**. The bottom was flat, with L-section chine-timbers and a parallelogram-shaped plan; the bottom was fastened temporarily while a set of frames was inserted, then made good before a second set of frames was added. The seams were caulked with a combination of string, moss, wooden laths and nails. The boat had a mast, stepped one-quarter of the way aft, and the steering-oar was probably mounted centrally at the stern. This shallow, barge-like boat, 19.4 m long, 2.9 m wide, and 0.9 m high, could have carried 7-10 tonnes of cargo; traffic in this region, both local and trans-continental, was intense under the early Empire.

Arnold, 1974; 1978; 1989.

**BEVAIX NE 1917**

**103**

Map 15

Switzerland

46° 56' N. 6° 59' E. Near Bevaix, in L. Neuchâtel.

No cargo.

Late 1st century BC.

A dugout found in 1917 was made from a tree felled in 39 BC.

Arnold, 1980: figs 7-9.

**Bilbao (Spain)**

Underwater finds from Betoño and other sites near Bilbao testify to ancient traffic, but do not apparently come from identifiable shipwrecks.

Urquiola, 1962.

**BINISAFULLER**

**104**

Map 3

Spain

39° 49' N. 4° 13' E. In Cala Binisafuller, SE. Minorca. Depth: 4-7 m.

Amphoras.

Early 2nd century BC (?).

Whether damaged by fire or blown into the cove by a storm, a substantial part of the ship survives. The cargo comprised amphoras of form Mañá B3, which are most frequently found in Catalonia, and that is no doubt where the last voyage started. The amphoras (of which at least 150 were excavated) had been packed upright in the ship with the aid of brushwood (lavender or thyme); many of them bear Punic letters or signs incised before firing. There were also three or four amphoras of types A3 and E (Ebusitan forms PE-14 and PE-15), and a Punic amphora, probably from Sardinia. Shipboard pottery comprised black-gloss ware, grey ware and coarseware, all with parallels from Ibiza. A fragment of Camp. A, together with other considerations, seems to set the date of the wreck

at the beginning of the 2nd century BC, later than was originally thought, though Guerrero et al. suggest rather the first half of the 3rd century.

The ship was ballasted with stones (possibly from Cap de Creus in Catalonia), and a number of round timbers (one attached by an iron nail) lay on the hull. The planking and frames were coated with pine tar, which enables the position of the frames (which have not survived) to be made out. The planking was assembled by mortice-and-tenon joints, according to the published reports, though a verbal communication suggests that dowels or pegs may have been used as well or instead; at any rate, it seems that four treenails (two in each strake) were used to fasten the planking joints, an apparently unique feature. Some sheets of lead were attached to the hull. All the wood found was Aleppo pine, except for one treenail which is said to have been of carob. The unusual details of the hull construction and the cultural associations of the shipboard material deserve full study and publication.

Fernández-Miranda, 1977: 817-20; Fernández-Miranda et al., 1977: 69-81; Cerdá, D. in Arribas et al., 1987: 239-42; Guerrero et al., 1989.

Information: M. Fernández-Miranda (Lipari, 1976).

**BODRUM AREA** 105 Map 13 Turkey

37° 12' N. 27° 23' E. (?). At an undisclosed location N. of Bodrum. Depth: 35 m.

Amphoras. 1st century BC.

A small, scattered cargo of Coan amphoras has been summarily reported.

Pulak, 1985a (site 4).

Bodrum area: see also **Kötlü Burun & Yalıkavak.**

Bolonia: see **Barbate.**

**BON-PORTÉ A** 106 Map 5 France

43° 10' N. 6° 39' E. NNE. of Cap Taillat. Depth: 50-52 m.

Amphoras. c. 550-525 BC.

The main cargo was of Etruscan amphoras; it is not known how many there may originally have been. The site lies in muddy sand, and no tumulus was visible when it was discovered; the central section was looted before excavations by J-P. Joncheray took place. The Etruscan amphoras (several of which bore graffiti) were stopped with a pitch-covered cork disc. Also on board were 12-15 archaic 'Graeco-Massiliot' amphoras and at least two Chian amphoras. The date (established from the finds by Bouloumié) confirms (on this occasion!) the C<sub>14</sub> determination of 570 bc ±100 (Gif-1862).

The only shipboard pottery recovered was a 'Rhodian' oinochoe. A spearhead was found in a concretion. A piece of lead (weighing 11 kg) could have been

the filling of a wood-cased anchor-stock, or may rather have been an ingot (whether goods or for use on board).

Unfortunately the hull was only poorly preserved; no ceiling or stringers were found, and, though it is clear that stitchings and lashings had been used for fastenings, none survived. The frames thus appeared to have been unattached to the planking (which was pitched internally). The frames were also widely spaced. The keel, of unusual cross-section, is very slight. The mast-step fitted over the frames with the aid of a tenon and mortice. How the planking was assembled has been the subject of discussion: the surviving planking was pegged at wide intervals with round dowels set in the edges of the strakes, and the latter were further held together by stitches wedged tight by small treenails hammered into the stitch-holes. The construction thus resembled that of traditional East African boats. Earlier interpretations, in which the Bon-Porte ship had originally been stitched but was rebuilt using treenails, or had been fastened so that the planks sat tightly on their inner edges but gaped (and were caulked) externally, do not carry the weight of the later view. First results from the Etruscan wreck at **Giglio Campese A** tend to confirm it. The surviving remains of Bon-Porté A show a vessel which was markedly rounded both athwartships and also fore-and-aft.

Liou, 1974a; 1975a: 595-7; Joncheray, 1976a; Basch, 1976; Jestin & Carrazé, 1980; Pomey, 1981 (with note by Basch); Koehler, 1981: 454; Bouloumié, 1981.

**BON-PORTÉ B** 107 Map 5 France

43° 10' N. 6° 39' E. (approx.). Named in reports 'Bon-Porté II' without further description of location. Depth: 33 m.

Amphoras. c. 150-100 BC (?).

A summary report has been published, with drawings of two amphoras, both of form Dr. 1A, but with a number of differences in detail; a third variety is illustrated by Joncheray, who calls it 'Transitional Graeco-Italic'.

Liou, 1975: 596-7; Joncheray, 1976d: no. 34.

**BORDEAUX** 108 Map 15 France

44° 47' N. 0° 30' W. (approx.). In the R. Garonne at Cadaujac, 15 km SE. of Bordeaux; opposite Château Malleret. Depth: 15 m (at high water).

No cargo (?). AD 161.

Some 4,000 bronze coins, ending with Faustina the Younger, were found during dredging (and some limited diving) in 1965 and 1970. South Gaulish and Spanish terra sigillata, coarseware and amphora necks, as well as some nails and fragments of wood, were also found. There is some evidence to suggest that the vessel sank because of fire. Study of the coins shows that the latest ones date between 159 and 161, probably 25 February 160, and it seems likely that the wreck occurred between spring and autumn of AD 161.

Mayet, 1969; Étienne & Rachtet, 1972; 1984.



**BORGO CAPRILE****109**

Map 8

Italy

44° 38' N. 12° 10' E. Found near Codigoro, in a former lagoon of the R. Po; left in situ.

No cargo.

Early medieval (?).

A stitched boat, with flat bottom, at least 10 m long, was investigated in 1956 by N. Alfieri, who considered it medieval. The construction is comparable with the Roman boat of **Cervia**; an 11th century date has been quoted by Bonino (1978), but without supporting evidence.

Alfieri, 1968; Bonino, 1968; 1978: 22; Basch, 1976: 39-41; Berti, 1986b: 25.

**BOULOURIS****110**

Map 5

France

43° 24' N. 6° 49' E. E. of Boulouris (or Boullouris). Depth: shallow.

Amphoras.

1st-mid 3rd centuries AD (?).

A poorly-preserved cargo of Dr. 20 amphoras lies in shallow water near Boulouris; no details have been reported, though the amphoras are described as of type Dr. 20A by Pollino, and many of them retain terracotta stoppers.

Benoit, 1960: 53; Joncheray, 1972c: 13-4; Pollino, 1976: 125.

Boutte, La: see **Pointe Bacon**.

**BOZBURUN****111**

Map 13

Turkey

36° 43' N. 28° 7' E. (approx.). In SW. Turkey. Depth: 33 m.

Amphoras.

5th-mid 7th centuries AD (?).

A well-preserved cargo of Byzantine amphoras lies in deep sand; only a summary report has been published.

Bass, 1974: 337-8.

**BOZUKKALE****112**

Map 13

Turkey

36° 33' N. 18° 1' E. Outside the harbour mouth of Bozukkale. Depth not reported.

Cargo not reported.

Date not reported.

A wreck at Bozukkale was found by an American survey; the report gives no description of either the cargo (amphoras ?) or the site. Two coarseware jugs and a bowl were raised, but no date is offered for them; they were thought to be

shipboard items. One can only regret that a well-founded archaeological expedition should produce such a poor report of its discoveries.

Rosloff, 1981: 280-1.

**BRÉGANÇON** 113 Map 5 France

43° 5' N. 6° 19' E. In the bay of Brégançon (Bréganson), W. of Cap Benat. Depth: 5 m.

Amphoras. 6th-5th centuries BC.

A wreck with archaic Greek amphoras, deeply silted over, was reported more than 30 years ago, without subsequent corroboration. One amphora has a graffito **VA** (?).

Benoit, 1952b: 261-2; 1956: fig. 1. 3; cf. *Gallia*, 11 (1953): 114-5 & fig. 18. According to Joncheray (1989b: 136) there are too few amphoras to make a wreck.

**BRESCOU** 114 Map 4 France

43° 15' N. 3° 30' E. Approx. 100 m off Brescou island, near Cap d'Agde. Depth not reported.

Grinding-stones. Date unknown (Roman ?).

A cargo of unfinished mill-stones, quarried from the local basalt of Ambonne, was found near Agde. Though the site was looted soon after its discovery, the cargo is thought to have been of modest size.

Bouscaras, 1960: 31-2.

**BRIANDE** 115 Map 5 France

43° 9' N. 6° 38' E. In Briande bay, E. of Cavalaire. Depth: 37 m.

Amphoras. c. 200-180 BC (?).

A classic tumulus site, measuring 13 x 7 m, with a cargo of Graeco-Italic amphoras. An attempt to protect the site from looting by means of an anti-torpedo net was unsuccessful. The amphoras are illustrated by Tchernia and Joncheray; the two drawn by Joncheray are remarkably different. According to Will's classification these amphoras are of her type D, but they do not resemble her specimen illustration. Tchernia compares the **Grand Congloué A** amphoras (which Will labels type C); perhaps closest are those from **Chrétienne C** (which are of type D, according to Will). If Joncheray's drawing is to be trusted, some of the Briande amphoras show a straight-sided body and upright handles which prefigure characteristics of the Dr. 1A form. An anchor-stock was also recovered from the site.

Tchernia, 1969: 472-3; Joncheray, 1971: pl. III, nos 3a & 4a (the second is his (1976d) no. 33); DRASM, 1983: no. 66.

**BRIDA MARINA****116**

Map 11

Italy

38° 17' N. 15° 31' E. (approx.). Near Capo Rasocolmo (Sicily); detailed location and depth not reported.

Pottery. 1st-2nd centuries AD.

A cargo of early Imperial 'rosso interno' pottery, comprising plates, dishes, bowls, etc., has been found near Capo Rasocolmo.

Unpublished.

Information: G.M. Bacci.

**BRINDISI****117**

Map 10

Italy

40° 37' N. 17° 57' E. In Brindisi harbour. Depth not reported.

Amphoras. 12th century AD (?).

The keel and some planking of a large medieval ship (at least 20 m long) were discovered at Brindisi. The cargo was amphoras, generally similar to Glunsein's forms 1-3.

D'Andria, 1979: 226 & pl. C; Sciarra, 1982: 129; 1985: 145.

**BRUGES****118**

Map 15

Belgium

51° 13' N. 3° 14' E. Near Bruges; at the edge of an ancient valley beside a Roman villa. Silted.

No cargo. 2nd-mid 3rd centuries AD.

A boat, found in 1899, survives in fragments; it was very similar to **London (Blackfriars)** in construction, and measured roughly 15 m in length x 4½ m in beam. The mast-step and part of the mast survive; they show that the boat was sailed, using a single square sail. A steering-oar was found. The planking was attached to previously set-up frames using iron nails (driven into treenails already lodged in holes in the frames); no caulking survives, though it must have been used. No evidence of the purpose which the boat could have served has been found. The date is derived from a C<sub>14</sub> determination, AD 180±80.

Marsden, 1976 (with references).

Brusc, Le: see **Cap Sicié**.

**BRUZZI****119**

Map 6

France

41° 28' N. 9° 1' E. Near Bruzzi islands, NW. of Bonifacio (Corsica). Depth: 30 m.

Amphoras. c. 300-250 BC (?).

A cargo of Graeco-Italic amphoras, Will Type A1, lies scattered on a rocky bottom. No other material is reported, apart from a lead ring.

Bebko, 1971: 2 & 52-3.

Businco: see **Scoglio Businco**.

Cabo Creus: see **Cap de Creus**.

**CABO DE GATA** 120 Map 2 Spain

36° 48' N. 2° 2' W. (?). A wreck referred to as 'Escollo-3', at Cabo de Gata (Almeria); detailed location, etc., not reported (perhaps at Ensenada de los Escullos).

Amphoras. c. AD 175-325 (?).

Only a brief reference has been published to a wreck of Afr. 1 and Almagro 50 amphoras. The Afr. 1 amphoras are said to have retained traces of pitch; this would be otherwise unparalleled, and perhaps they are really Afr. 2 - this wreck would then fall in line with, e.g., **Cabrera A**.

F. Nestarés, in Molina, 1983: 349-50.

Cabo de Gata area: a number of wrecks along the Almeria coast are mapped by Cara & Ortiz (1987, fig. 3), but without names or any information.

**CABO DE MAR** 121 Map 15 Spain

42° 19' N. 8° 40' W. (approx.). Off Cabo de Mar, just W. of Vigo (Pontevedra). Depth not reported.

Amphoras. 1st-3rd centuries AD (?).

A fragmentary cargo of fish-sauce amphoras, said to be of the 1st-3rd centuries, has been briefly reported. The amphoras (not illustrated) are perhaps of form Beltrán 2B.

Hidalgo & Sotelo, 1985: 131, with fig. 2, no. 31.

**CABRAS** 122 Map 6 Italy

39° 52' N. 8° 31' E. (approx.). Near Cabras (Sardinia); detailed location and depth not reported.

Lead ingots. Roman period.

A Roman wreck with a cargo of lead ingots has been summarily reported.

Mocchegiani & Fozzati, 1991.

**CABRERA A** 123 Map 3 Spain

39° 9' N. 2° 56' E. At the E. side of the mouth of Cabrera harbour (Balears); known as 'Cabrera-1'. Depth: 22 m.

Amphoras and tiles. c. AD 300-325 (?).

Test excavations in 1979 by V. Guerrero and D. Colls established that two well-preserved shipwrecks lay only 60 m apart in an inlet just below the fort of Cabrera; they named the wrecks 'Cabrera-1' and 'Cabrera-3', here 'A' and 'C'. Previous investigations had concentrated on wreck C, but material from both wrecks had found its way to Palma Museum (where it was seen by the writer) and was illustrated by D. Cerdá, with reservations about the unity of the site, as from Cabrera '1-A' and '1-B'. Both sites include amphoras of Afr. 2B-D form; they may be contemporary, though the other amphoras found at each site suggest that wreck C is in fact earlier. The two shipwrecks can be firmly distinguished because the hulls are preserved, and the lie of the timbers shows that there are indeed two separate wrecks (subject to complete excavation of the site, which might possibly reveal an even more complicated situation). These findings are important, not only in themselves, but to show how likely it is that, in circumstances less favourable for preservation, several wrecks, especially if they are close in date, can become confused.

The amphora cargo of Cabrera A is overlain by a layer of tiles, which may have had a saleable value as well as serving to protect the amphoras. The amphoras, stamped **COL MAL**, **TOP MAE** and **FAN FORT COL HA(D)**, were lined with pitch, and contained the articulated remains of mackerel. These amphoras (of common varieties of the Afr. 2 form) are probably represented by the two left-hand drawings under the label 'Cabrera 1-B' on the chart by Cerdá; one of these is stamped **AELEOR .ASYL**. There was only one layer of these amphoras. To one side of the Afr. 2 amphoras were some pear-shaped amphoras described as of form Almagro 51C, and a small amphora of form Beltrán 72. To the other side (and not shown in detail) were Almagro 50 amphoras, of which many fragments are said to be lying on the site.

One hopes that this well-preserved and interesting shipwreck will be the subject of further work, both on site and ashore.

Cerdá, 1971; Guerrero & Colls, 1982.

**CABRERA B** 124 Map 3 Spain

39° 9' N. 2° 55' E. (approx.). Somewhere on the W. side of Cabrera harbour. Known as 'La Nave Cartaginesa' or 'Cabrera-2'. Depth: 35 m.

Amphoras, pottery and lead ingots.  
c. 250-225 BC.

Only material robbed from this site over the years 1965-70 has been published; it is divided between several collections. There are amphoras of several Punic types; one each of Mañá Types A and B, two of type Cla, four of Type E, and over a dozen Type D. There are also Graeco-Italic amphoras, of both full and half size, Will Type A1; these were very probably made in Catalonia or S. France, according to Cerdá (1987). Black-gloss pottery (whether cargo or shipboard cannot be established) comprises cups, plates, a jug and a guttus, some or all of which was made at or near Rosas (in Catalonia) and can be firmly dated in the period 300-225 BC. An early Camp. A guttus is of the 2nd half of the 3rd century. Several coarseware cups and jars and a jug are probably from Ibiza, a Punic colony; a standed dish and a louterion have parallels in Lipari and further east. Four ingots of lead are known from the wreck, shaped like *Pinna nobilis* shells; the two which are available for study weigh 38.6 kg and 40.0 kg. From the site also came part of an iron anchor.

The material from this shipwreck is an interesting group, illustrating the commerce of the W. Mediterranean region at the time of the First Punic War. It is unfortunate that the ship has not been located and studied archaeologically, for it might provide important information about the development of shipbuilding in the region.

Cerdá, 1979a (with references); Kapitän, 1979: 102-4; Guerrero & Colls, 1982: 6; Ramón, 1981: 43; Aranegui, 1985: 104; Guerrero, 1986: 156 & 185; Cerdá, D., in Arribas et al., 1987: 235-9.

Information: D. Cerdá.

#### **CABRERA C**

125

Map 3

Spain

39° 9' N. 2° 56' E. Close to wreck A; also called 'Cabrera-3' or 'Cabrera 1-A'.  
Depth: 22 m.

Amphoras.

c. AD 255.

Only 60 m S. of **Cabrera A** is the site partly excavated in 1970-1 and visited by D. Rugg in 1976; the test excavation by Guerrero & Colls in 1979 established that it was a distinct shipwreck. At the N. edge of their trench they found the ship's side, and, a little to the S., a group of upright amphoras, form Dr. 20. Further S., and presumably over the keel, were Afr. 2C amphoras; they think that the various smaller types of amphoras formerly raised came from the southern side of the ship. It seems possible that there was originally at least one upper layer of amphoras (at least, of the Dr. 20 amphoras). The Dr. 20 amphoras are of a late type; the smaller amphoras are of the form, also made in the Baetis valley, now identified as 'Tejarillo 1'. There are also Dr. 23, Beltrán 72 and (according to a later report) Beltrán 68 (pear-shaped) amphoras. No details of the Afr. 2 amphoras are given by Guerrero & Colls, though it appears some had a cylindrical lip, like the main type of **Femina Morta**; perhaps, too, the right-hand amphora in the drawing by Cerdá (1974, chart, 'Pecio Cabrera 1-A') is from this cargo.

Further excavations took place in 1985, and apparently produced coins closing with the year AD 253.

Cerdá, 1971, chart; Guerrero & Colls, 1982; Bencivenga, 1987: 397; Guerrero, 1988: 31; Guerrero et al., 1987.

Information: D. Rugg; D. Cerdá; F. Mayet.

**CABRERA D**

126

Map 3

Spain

39° 9' N. 2° 57' E. (approx.). Near Cabo Moro Boti, Cabrera; detailed location and depth unknown. Named also 'Cabrera-4' (Guerrero & Colls), 'Cabrera 3' (Cerdá) and 'Moro Boti A' (Veny).

Amphoras and lead ingots. c. AD 1-15.

Only material is known from this wreck. More than 700 amphoras have come from it, of which 60 have been seen by C. Veny; all but one of these are of form Dr. 7 (with five varieties of lip). In this respect the cargo is an interesting contrast to its near-contemporary, **Sud-Lavezzi B**. Some amphoras have a monogram stamp **SAX** on the neck. The odd one is a headless body of Dr. 2-4 form (wrongly called Dr. 1 by Veny). No hint of any contents has been reported. Several tons of lead ingots were on board; 21 have been studied. All are counterstamped **M LICN MF** and **AVSVA** on the sides; the mould-marks are **ANTEROS EROS**, **L.IVNII DVO**, **T.L.OSCA** and **SOC.VESC**. The ingots weigh from 33 kg to 38 kg; like the amphoras, they probably come from Baetica.

Other items said to be from this wreck comprise a small lead reservoir and a lead jar (or cap?), a bronze jug-handle, a terracotta tubelet, and a coarse-ware jug and jar (which are of the appropriate period - not very well drawn in Veny (1979: fig. 6), but seen in a photo taken by D. Ruegg). An Arretine plate (with rectangular stamp) dates the wreck to the years before AD 15.

Three bronze helmets have also been found, of which two have been studied; they are of Robinson's Group 4, 'Gallic Imperial'. In the heyday of the Pax Augusta it is inconceivable that these could represent precautions against pirates; they could have been for use by watchmen in port, or have been part of the kit of soldiers in charge of imperial property (silver?) aboard, or travelling to or from their posting.

Two iron anchors, of identical form, are valuable dated examples.

Veny & Cerdá, 1972; Veny, 1979.

**CABRERA E**

127

Map 3

Spain

39° 9' N. 2° 55' E. At the W. side of the entrance to Cabrera harbour; on a shelving, sandy bottom, 80 m from the land. Depth: 42 m.

Amphoras and lead ingots. c. 10 BC-AD 25 (?).

The site ('Cabrera-5') was investigated by Guerrero & Colls in 1978-9; they were able to rescue 23 lead ingots, which looters had stacked near the wreck, ready for raising. Two other ingots from the site were meanwhile published by Veny. The mould-marks include the marks **HAVE IVLI VERNIO**, **M.VALERI.ABLON**, **T ANNI BER**, **P CAECILI POPILLI**, **P POSTVMI RVFI**, **Q.AELI SATVLLI**, **L.FLA - C.POM**, **Q.HATERI.GALLI** and **PLVMB.CA[ ]**; the counterstamps include **L.FANNI**, **Q.CAECIL**, **GI.NI**, **DEMETRI**, **Q.POMP**, **SATVL** and **Q.P.S**. Most of the ingots bear incised numerals on one long side, indicating variation in weight from a norm of 100 pounds. Weights vary from 32 to over 42 kg.

The main cargo, which originally formed a tumulus over 10 m in diameter, was of amphoras of forms Dr. 7 and Dr. 9. One of the Dr. 7 amphoras was stamped **CAL** on the neck. No other dating evidence for the site was found; the form of the amphoras suggests that they are Augustan, dating from the late 1st century BC or the first quarter of the 1st century AD.

Pieces of the ship, broken off by looters, were visible on the site; also from the ship came three pieces of lead drainpipes.

Veny, 1980; Guerrero & Colls, 1982: 10-14 & pls; Colls et al., 1986.

### **Cabrera: other sites**

The list by Mascaró (1967) includes ten wrecks round Cabrera, of which no. 1465 is Na **Redona** and nos 1470-1 are possibly **Cabrera A, C** and/or **E**. If the others exist (which they may well do), nothing reliable is known of them.

For the attribution by various authors of a group of Flavian lead ingots to one or another site off Cabrera, sv. Ses **Salines**.

### **CÁDIZ A** **128** Map 2 Spain

36° 31' N. 6° 20' W. 'Pecio del Aculadero', in La Caleta, Cádiz. Depth not reported.

Amphoras. 4th century BC ?

Punic amphoras and pottery of the 4th century (some perhaps rather later, too) was found over the years in La Caleta. The material was thought by García y Bellido and by Reina to come from a wreck; Vallespin thinks that it may be port debris, but an excavation is necessary to decide; Lopez & García deny outright that there is a wreck at this place.

García y Bellido, 1971; Reina, 1973; Vallespín, 1985; López & García, 1985.

### **CÁDIZ B** **129** Map 2 Spain

36° 31' N. 6° 20' W. Off Punta de la Nao, Cadiz. Depth not reported.

Amphoras. c. 100-40 BC (?).

A substantial cargo of amphoras has been reported without details. The single amphora which has been published is ovoid (cf. **Cap Sicié, Planier E, Grand Congloué C**, etc.), though it is attributed by Beltrán to form Dressel 10; it contained about 50 grape pips, and analysis of its lining revealed tannins appropriate to wine, or (more likely in this case) must.

Chic, 1980; Beltrán, 1987: 61.

### **CADIZ C** **130** Map 2 Spain

36° 31' N. 6° 20' W. 'Pecio del Clavo', 300 m from San Sebastian point, Cadiz. Depth: 13-14 m.

Amphoras. c. AD 1-250 (?).

Material found lying on sand in a survey comprised fragments of Dr. 20 amphoras and dolia, and a bent copper nail. Possibly these objects were trawled up somewhere else and dumped at this site.



Vallespín, 1985 (fig. 2. 4).

**CÁDIZ D** 131 Map 2 Spain

36° 31' N. 6° 20' W. 300 m W. of wreck C, on a rocky bottom. Depth: 10-12 m.

Amphoras and lead ingots (?). Late 1st century BC-early 1st AD (?).

Only fragmentary remains survived of this probable wreck. A lead ingot (uninscribed, but probably of the Augustan period) was found together with two fragments of Dr. 9 amphoras, a Dr. 12 and a Beltrán 2B.

Vallespín, 1985.

**CÁDIZ E** 132 Map 2 Spain

36° 32' N. 6° 20' W. 'Pecio de las piedras de molino', on the SW. tip of Punta de la Nao, Cádiz. Depth: 9-10 m.

No cargo (?). Roman period.

The remains of a wreck, partly concreted to rock and partly lying in sand, comprised two mill-stones, four squared stone blocks, and some undatable coarseware and amphoras.

Vallespín, 1985: 65 & fig. 2. 11.

**CÁDIZ F** 133 Map 2 Spain

36 32' N. 6 20' W. Off Punta de la Nao, Cádiz. Depth uncertain.

Terracottas, etc. 7th or 6th century BC.

The scattered remains of an archaic Punic wreck lay off Punta de la Nao. According to the earliest report (by Blanco), they were in 22-25 m depth, 100-200 m from the point, in a large area scattered with pottery which was thought to include at least one wreck. This exact location has not been confirmed, but in their recent assessment of the site Ramírez & Mateos conclude that the archaic material does derive from a wreck (not a land site or votives). The main items recovered comprise a head (datable c. 650-550 BC), an incense-burner stand, and a figurine of a female deity found together with an ornamented disc in an amphora.

Blanco, 1970; Ramírez & Mateos, 1985 (with references).

#### **Cádiz area**

Other finds reported by Vallespín (1985) include a copper ingot and two gold coins (aurei of Nero and Galba) from salvage or dredging on Bajo del

Picacho, near Chipiona.  
See also **Sancti Petri**.

**CAEN A & B**                                      134-135                      Map 15                      France

49° 11' N. 0° 22' W. Found in silt near Caen.

Two boats, apparently Roman, were found in 1864; one (fragmentary) was found with coins of Antoninus Pius, the other (deeper and therefore earlier) had a cargo which included animal horns.

Ellmers, 1972: 282-3.

**CAESAREA A & B**                                      136-137                      Map 14                      Israel

32° 30' N. 34° 53' E. At Caesarea Maritima; on the Roman harbour breakwater. Depth: less than 6 m.

Amphoras.                                      Late 3rd/early 4th centuries AD.

Two heaps of broken amphoras were found on top of the ruined Roman breakwater; these represent ships which struck the breakwater after it had subsided, or become ruinous.

Raban & Linder, 1978; Raban, 1989: 87. The latter report mentions several other possible wreck sites, not all ancient (pp. 93 & 158); cf. CMS News, 11-12 (March 1985) '17 wrecks'.

**CAESAREA C**                                      138                      Map 14                      Israel

32° 30' N. 34° 53' E. Within the ancient harbour of Caesarea; 50 m S. of the N. breakwater. Depth: 7 m.

Ballast (?).                                      Mid 3rd century AD (?).

Stormy weather in the winter of 1986-7 exposed an area of the ancient harbour bottom; survey revealed a large deposit of squared basalt slabs (apparently ballast), lead sail-rings, pieces of lead sheathing, and some bronze coins, said to be early 2nd century AD. What appears to be the same site was later reported to have produced coins of Philip the Arab (AD 244-9).

CMS News 15 (April 1988); Raban, 1989: 233.

Caesarea: see also **Straton's Tower**.

**Caesarea: other sites**

Fragments of wood and lead sheathing, nails, amphoras, etc., were found at the entrance of the Roman harbour, but appear to represent an occupation deposit rather than a true shipwreck (Raban, 1983: 243-5; Oleson, 1983).

A hoard of over 300 gold aurei (Augustus-Trajan) was found in the ancient harbour of Caesarea in 1968, but there is no evidence for any wreck at the site (Numismatic Literature, 82: 165; Raban, 1989: 233).

Rhodian, Coan and Cnidian amphoras, said to be datable late 2nd-early 1st centuries BC, were found at the Cove West of Area J, and could represent a wreck, according to Raban (1989: 232).

'Caesar's Galley': see **Marseille (Galère de Cesar)**.

**CAGLIARI A** 139 Map 6 Italy

39° 10' N. 9° 20' E. (?). At an unknown location in southern Sardinia, probably near Cagliari.

Amphoras. 1st-3rd centuries AD.

Five pear-shaped amphoras of Gaulish type (G4) came from the sea, and probably derive from a wreck.

Pianu, 1986: 41-5.

**CAGLIARI B** 140 Map 6 Italy

39° 10' N. 9° 20' E. (?). Like wreck A, probably near Cagliari.

Amphoras. 3rd-mid 4th centuries AD.

A group of four amphoras, described as of African type, no doubt derive from a wreck near Cagliari.

Pianu, 1986: 44, note 53.

**CALA BARBIERE** 141 Map 7 Italy

42° 48' N. 10° 45' E. N. of Punta Ala; 50 m from the water's edge. Depth: 3 m.

Amphoras and architectural ornaments.  
c. 200-150 BC (?).

Scattered fragments of Graeco-Italic amphoras found in 1978 indicate a wreck. The amphoras (pace the parallels given by Cygielman) are of Will type D. From the same site came a Doric frieze in terracotta; of rather small scale, this might have been part of the ship, though comparison with **Losinj** indicates that such items were indeed transported by ship.

Cygielman, M. in Martelli et al., 1982: 46-8.

### **Cala Cartoe (Italy)**

A lead ingot, inscribed **L.PLAANI.L F - RVSSINI**, was found in the sea near Dorgali on the E. coast of Sardinia. The published reports make no reference to any associated finds.

Contu, 1967; Boninu, 1985; 1986: 61.

**CALA CATIVA** 142 Map 4 Spain

42° 21' N. 3° 13' E. Off Cala Cativa, 2 km E. of Port de la Selva. Depth: 32 m.

Amphoras. c. 50 BC-AD 25 (?).

From a 'field of amphoras' on a mud bottom, discovered by a coral diver in 1894, 62 amphoras and a lead anchor-stock were raised. Drawings of two amphoras have been published; they are of two varieties of the Pascual 1 amphora produced in the region. The remains of the cargo were looted in 1965, but the hull survives, unexamined.

Ribera, 1961; Pascual, 1962a; Foerster, 1985b.

Cala Culip: see **Culip**.

**CALA CUPA** 143 Map 7 Italy

42° 22' N. 10° 55' E. On the E. coast of Giglio (Tuscan Islands). Depth: 4-18 m.

Amphoras. Late 1st-early 2nd centuries AD (?).

A wreck in relatively shallow water includes many broken amphoras. According to Rendini & Picozzi, they are Baetican (Dr. 20) and Gallic (G4) amphoras, but information from divers indicates there are also Italian amphoras (cf. Panella 40-41). One G4 amphora is stamped **CIFENNI P.AEONI**; samples taken from resin linings produced pollen of trees and plants, including rye and wheat, and remains of beetles, one being the grain parasite Sitophilus granarius L. A Tripolitana 1 amphora and a jar in a t.s. chiara form were also found.

Rendini, P. in Martelli et al., 1982: 51; Picozzi, 1984b; Arobba et al., 1983.

**CALA DE SANT VICENT** 144 Map 3 Spain

39° 55' N. 3° 3' E. At Cala de Sant Vicent (Majorca). Depth not reported.

No cargo (?). Roman period.

The timbers of a Roman ship, lead-sheathed, have been only summarily reported.

Mascaró, 1962: 175; 1971: 72.

**CALA DEL PICCIONE** 145 Map 7 Italy

43° 1' N. 10° 31' E. (approx.). Behind Punta delle Tonnarelle, Baratti bay; at the foot of a sea-grass and mud slope. Depth: 27-30 m.

Amphoras. c. 400-350 BC.

A shipwreck with Etruscan amphoras of the first half of the 4th century BC, encrusted and deeply buried, was surveyed by N. Lamboglia and F. Pallarés. Finds include a bronze situla. To date only a brief report has been published.

Romualdi, A. in Martelli et al., 1982: 54 (cf. 38-9 & fig. 4); Pallarés, 1983e.

**CALA DI LI FRANCESI** 146 Map 6 Italy

41° 13' N. 9° 22' E. In Cala di Li Francesi, on the W. side of La Maddalena island (Sardinia); depth not reported.

Dolia. 1st century BC-1st century AD ?

The broken-up remains of five or six dolia, one very large, have been reported; this must represent a wreck.

Boninu, 1986: 59.

**CALA GADIR** 147 Map 11 Italy

36° 48' N. 12° 1' E. Near Cala Gadir (Pantelleria); the site extended 80 m along the cliffs. Depth: 18-52 m.

Amphoras. 2nd century BC (?).

An extensive amphora site was well known to divers long before a short survey by N. Lamboglia in 1973. Amphoras lay in gullies at 18-25 m, half-buried in sand at 25-44 m, and (tumbled) at 44-52 m, along a considerable length of cliff. About 140 amphoras are preserved from what must originally have been thousands. The amphoras included Punic 'holemouth' jars and Maña C amphoras of at least four varieties; these must range in date from the 3rd to the 1st centuries BC (if not a longer period). There were also Graeco-Italic amphoras (Will types C/D and E), Dr. 1A and 1C, and Dr. 1B amphoras. The amphoras alone suggest that two, maybe three ships, were wrecked at this place, but it is unfortunately impossible (on the basis of present information) to reconstruct their cargoes. Other finds are said to include an amphora of stone (sic) and bars of lead.

There may, in fact, be further wrecks near the site: a 4th century AD Roman



Cala Pedrosa: see **Illa Pedrosa**.

**CALA PORTALÓ** 151 Map 4 Spain

42° 19' N. 3° 16' E. (approx.). At Cala (or Illa) Portaló, on the N. side of Cap de Creus, between El Golfet and Cala Culip; detailed location and depth unknown.

Amphoras. c. 200-175 BC.

Little is known about a wreck of Graeco-Italic amphoras at Cala Portaló. Both full-size and half-size amphoras were recovered, together with one of Punic type and some white-slipped pottery, possibly local. The date may be second, rather than first, quarter of the 2nd century BC.

CRIS, Revista del Mar 6. 70 (1964): 27; Nolla & Nieto, 1989: 380 & 390.

Information: R. Pascual.

**CALA ROSSA** 152 Map 6 France

41° 37' N. 9° 20' E. On the N. side of Porto Vecchio bay (Corsica); 50 m from the beach. Depth: 3-5 m.

Amphoras. c. 300-250 BC (?).

A cargo of amphoras, mostly Graeco-Italic (Will type A1), lies in shallow water, close to a holiday beach; nonetheless, quite a lot of material has been recovered and briefly published. The Graeco-Italic amphoras are inscribed with Latin graffiti, mostly on the shoulder; only L and L **AVREL(IVS)** have been definitely read, but others, too, are probably Latin names (cf. **Terrasini B**). Amphoras of both whole and half size are present, as in other Graeco-Italic wrecks; one is stamped on a handle (not read). In 1974, limited excavations produced a Punic amphora (Maña type Clb); though this was the first of its kind to be reported from the wreck, it may have been part of the cargo. Five incomplete pottery vessels in 'terre fine' (not further described, and unidentifiable) are presumably shipboard equipment.

Bebko, 1971: 2 & 46-8; Tchernia, 1969: 496; Liou, 1975: 604; Guerrero, 1986: 159.

**CALA ROSSANO** 153 Map 9 Italy

40° 47' N. 13° 25' E. On Ventotene (Pontine Islands); the wreck (also referred to as 'Santo Stefano' or 'Ventotene') lies on rock, with some sandy patches close by. Depth: shallow.

Amphoras and other goods. c. AD 1-50 (?).

The wreck was extensively looted in 1981-3; said to have covered 40 x 15 m, it was evidently well-preserved. In 1991 an archaeological investigation of the site began under F. P. Arata. The cargo amphoras were south Spanish amphoras,

Dr. 7-11, of several types including Cam. 186A; the range of types appears to resemble that of **Lavezzi B**, but a rather earlier date (as here) is given by Gianfrotta. All of the amphoras retained painted inscriptions on the neck; several bore the name of a merchant (C. Annius Senecio), and, in one case, the first word **LVM** can be plainly made out. Lym(pa) or lym(phatum) was apparently some kind of aromatized fish-sauce; the contents (if any) of the wreck amphora labelled **LVM** are not specifically reported, but divers have found 'spices' (spezie) and hazel-nuts in one amphora and grape-stalks in another, and recent investigations have found a vine branch and grape pips inside an amphora. Other amphoras were full of a dense sludge, not identified. Most of the amphoras retained stoppers, some made of pottery, others of what appeared to be metal and formed like a filter. Many round wooden boxes were found, containing styli, or, in some cases, hair-pins; it is not clear whether these were finished articles or roughouts, nor if they were of ivory or bone. Recent investigations have found 15 tin ingots, of different sizes and shapes (some rectangular, with a lobate handle at each end, others like a pudding ('pan di zucchero') with a straight handle at one side; one is inscribed **VVLS | N N** (?).

Shipboard equipment included coarse pottery (some blackened by fire), fine-wall ware, some lead containers, strainers, handles of ivory and of wood, a marble basin, the lock from a chest, an iron knife, and lead fishing-weights. There was a roll of lead sheet for repairs. Fragments of the ship included wooden pulleys, 3 metres of cable, some discs from the pump, lead tubing, bronze nails, fragmentary planking and lead sheathing. The wreck is also said to have produced one or more bricks and some 'curious brickwork' (not illustrated); it seems possible, therefore, that the ship had a galley.

The cargo of this magnificently preserved wreck was mostly stripped off and dispersed by looters. That both the contents and the labels of the amphoras were preserved means that some of the puzzling Latin terms used for fish-sauce (or other substances ?) could have been explained. The loss of so much of this important site, as recently as the early 1980s, underlines the seriousness and urgency of attempts by archaeologists to record shipwrecks wherever they can.

Cappelletti, 1981; 'Napoleone', 1983; Braca, 1982; Gianfrotta, 1986.

Information: F.P. Arata.

See also Le **Grotticelle, Punta dell'Arco & Ventotene**.

#### **CALA SCIROCCO**

154

Map 7

Italy

42° 14' N. 11° 6' E. On the SE. side of Giannutri (Tuscan Islands); on a steep slope by a cliff. Depth: 35-40 m.

Amphoras.

c. 200-150 BC (?).

A cargo of Graeco-Italic amphoras, originally forming a tall mound, lay partly on protruding rocks, partly in sand, on a steep slope. Survey by N. Lamboglia in 1960 showed that, despite looting, the cargo and the ship were well-preserved. Finds from the site include a lead anchor-stock of movable type (decorated with a caduceus), a lead scupper (?) pipe, a copper vessel, pieces of iron and lead pipes, and an unstated number of grinding-stones.

The amphoras are of Will type D (and are presumably referred to by her (1982), p. 351, note 28); however, the illustration published by Lamboglia, which shows a Cala Scirocco amphora beside one from Chretienne C, demonstrates the wide variation in this type.



Lamboglia, 1959: 312; 1960: 359-60; 1971c: 375-6; Pallares, 1971: 392; Rendini, P. in Martelli et al., 1982: 52-3.

**CALA USTINA A & B** 155-156 Map 6 Italy

40° 55' N. 8° 43' E. (approx.). Near Castelsardo (Sardinia); detailed location and depth not reported.

A. Cargo not reported: Republican period.

B. Cargo not reported: Imperial period.

Two wrecks were reported from Cala Ustina in 1975. 'Pottery fragments' give the dates, but nothing about cargo, ships' hulls, etc., has been published. A sounding-lead (published) could be from either wreck.

Boninu, 1986: 58.

**CALA VELLANA** 157 Map 3 Spain

39° 57' N. 4° 16' E. Near Es Grau (Minorca). Depth: 12-13 m.

Amphoras. c. AD 50-60.

Over 200 Dr. 2-4 amphoras of a type made at Oliva (Valencia) have been recovered from the wreck, surveyed in 1979 (but not yet published) by J. de Nicolas. None of the amphora bottoms is stamped. There is also one ovoidal amphora, and some South Gaulish terra sigillata and Hispanic coarse-ware.

Nicolas, 1973: 170 & 173, fig. 3; cf. Enguix & Aranegui, 1977; Fasti Archaeologici, 32-3 (1984), no. 12399; Corsi-Sciallano & Liou, 1985: 155-7; Liou, 1987b: 274-5.

### **Cala Volo di Notte (Italy)**

A wreck at Cala Volo di Notte on Giannutri, surveyed by N. Lamboglia, has been only summarily reported. Finds consisted mainly of pottery barriletes, said to be of uncertain date.

Rendini, P. in Martelli et al., 1982: 53.

**CALANQUE DE L'ÂNE** 158 Map 5 France

43° 6' N. 5° 17' E. (?). Apparently known as 'Calanque de l'Âne 3'; on Pomègues (Marseilles Bay). Depth: 18 m.

Tiles. Late 1st century AD.

A Roman tile-cargo, by now much looted, is said to have been known since 1956, but has not (so it seems) been published; recent investigations by Ximenès

and Moerman were reported at Bovisand in 1990. The cargo of tiles originally comprised at least two, maybe three, layers. There was also some pottery, glass unguentaria, a pillar-moulded glass bowl, a net-sinker, and, in the mast-step, a coin of Domitian. The pottery and glass date the wreck to the last 20 years of the 1st century AD. The ship extended some 22 m; she was very heavily built (cf. other tile wrecks, such as La **Luque A**).

Unpublished.

Information: S. Ximénès; M. Moerman.

**CALANQUE DU BERGER**                      **159**                      Map 5                      France

43° 15' N. 5° 21' E. (?). Near Marseilles; location and depth not reported.

Cargo not reported.                      Roman period (?).

The lead pipe of a pump was found in the central part of an otherwise unpublished shipwreck.

Carre, 1983.

#### **Cales Coves (Spain)**

A large quantity of material, nearly all of the 4th-2nd centuries BC, found in Cales Coves (Minorca), has been collected and published in full; the site is a sheltered bay with a fresh water supply, and it seems that all the finds are from ships taking refuge there.

Fernandez-Miranda et al., 1977: 21-67.

**CALLATIS A**                      **160**                      Map 1                      Romania

43° 48' N. 28° 36' E. At ancient Callatis (modern Mangalia); found in dredging at the S. side of the modern harbour. Depth: shallow.

Amphoras.                      c. 200-150 BC (?).

Two Graeco-Italic amphoras (Will type D) were found close to each other under a thick layer of mud, and are thought to be from a wreck.

Cosma, 1973: 53-4; cf. Scarlat, 1973.

**CALLATIS B**                      **161**                      Map 1                      Romania

43° 48' N. 28° 36' E. Close to 2 Mai village, 400 m S. of ancient Callatis. Depth: 8 m.

Amphoras.                      3rd-2nd centuries BC (?).

A wreck with a cargo of Thasian amphoras is deeply buried in sediment. Some timbers (apparently substantially preserved) were also found.

Cosma, 1973: 54-8; Scarlat, 1973 (cf. fig. 3).

**Callatis: another site**

The account and maps published by Scarlat (1973) indicate three ancient wrecks off Callatis, but no details of the third have been reported.

Calseragne (or Calseraigne): see **Ouest de Plane** and **Plane**.

**CALVI** 162 Map 6 France

42° 34' N. 8° 45' E. (approx.). Off Calvi (Corsica); location and depth not reported.

Pottery. c. AD 1500 (?).

A cargo of perhaps 10,000 glazed bowls lies off Calvi; only a brief reference has been published. The bowls (some with a wide horizontal lip) have geometric designs, including a cross and a chrysanthemum-like flower, on a field of brown, yellow, buff, green, cream or white. The wreck is thought to date from the first part of the 16th century.

Dumas, 1972: 177-9. Presumably this is not the same wreck as the late 16th century wreck in Calvi harbour, declared in 1979 and reported by Villié (1989).

Camarat: see **Cap Camarat**.

**CAMARINA A** 163 Map 11 Italy

36° 51' N. 14° 27' E. On the S. side of ancient Camarina (or Kamarina), Sicily; 50 m from the beach, towards its E. end. Depth: 2-4 m.

Marble columns, amphoras and pottery.  
c. AD 175-200 (?).

A remarkably complete wreck lies in shallow water on an exposed coast; it was surveyed by G. D'Andrea and the writer, and recently investigated further by G. Di Stefano and Aquarius. The main cargo was of 'giallo antico' marble columns, of which two are in situ, though others could possibly have been salvaged in the past. There are also sandstone blocks, which might have been ballast, or, more probably, were to help wedge the columns in place. Unused plates and casseroles of 'black-rim' and 'rilled' ware must have been cargo; so, too, though found only in small quantity, were Afr. 1 amphoras; contrary to the original published report, these were not pitched internally, and (pace Tortorella) there were no Afr. 2A amphoras. Recent finds include two small

bronze buckets with swan's-head terminal handles, an insulated bronze urn decorated with theatrical masks and a lion protome, three decorated strigils and a small urn with blue paste inlay; a bronze herm now in Ragusa Museum may have come from the ship, which may have carried a series of them. Other finds comprise an iron anchor, an iron object (still in situ) which may be the concreted remains of several other anchors, and what was perhaps the iron hoop from a cask. The ship's hull is preserved, and said to be of standard construction.

Parker, 1976; Ricciotti, 1975/6; Tortorella, 1981: 362; Di Stefano, 1991.

**CAMARINA B** 164 Map 11 Italy

36° 51' N. 14° 27' E. At the W. end of the beach of Camarina; in shallow water.

Lamps. 1st century AD.

An early Imperial wreck with a cargo of lamps was exposed in 1989. The lamps are of African type, all with the maker's mark **STACTE**; they were new when wrecked, piled in fabric sacks for transport. A bronze dolphin is also said to have been found, though this is not mentioned in the published report.

Di Stefano, 1991.

Information: G. Kapitän.

**CAMARINA C** 165 Map 11 Italy

36° 51' N. 14° 27' E. Between wrecks B and C. Depth: 5 m.

No cargo (?). 12th century AD (?).

A wooden hull, broken into three sections, and estimated to have been 25-30 m long, lies in shallow water off the beach of Camarina. Pots, 35 cm in diameter, made of iron plates might have been to hold fire, and a large concretion contained hammers, tongs, pliers, nails, horseshoes and chain. Horse bones have also been found at the site in recent investigations by G. Di Stefano. Pottery from the site has Arab parallels, and the ship resembles **Marsala A**, so may be of the same date. Since the hull is only 4 m wide, it must be a galley, whether transporting food or horses.

Di Stefano, 1991.

Information: G. D'Andrea; G. Kapitän.

**CAMARINA D** 166 Map 11 Italy

36° 51' N. 14° 27' E. To S. of wrecks **A-C**; depth not reported.

No cargo (?). c. AD 270.

A scattered hoard of coins, numbering about 1,000, together with chest fittings, presumably represents a wreck in shallow water off the beach of

Camarina. The coins are of Salonina, Gallienus, Tetricus I & II, Victorinus and Claudius II, together with barbarous radiates. The coins of the central Empire are from the mints of Rome, Milan and Cyzicus; how coins of the Gallic Empire, and provincial radiates, came to be on a wreck in southern Sicily, has yet to be explained.

Di Stefano, 1991.

**CAMIRUS** 167 Map 13 Greece

36° 20' N. 27° 57' E. On the N. coast of Rhodes; detailed location and depth not reported.

Amphoras. 13th century AD (?).

No details are recorded of a wreck with amphoras of form Günsenin 4, probably datable to the 13th century.

Günsenin, 1990: 319 (citing information from J-Y. Empereur).

Camp Long: see **Agay**.

Canale di Sicilia: see **Sicilian Channel**.

**CANARIAS** 168 (Not mapped) Spain

26° N. 16° W. (approx.). At an uncertain location in the Canary Islands.

No cargo (?). 3rd century AD (?).

Two different amphoras of identical form (similar to Robinson K 109, mid 3rd century AD) were published by García y Bellido; one had previously been taken away by a visitor. García y Bellido denied that the amphoras came from a wreck, but it seems at least possible. These amphoras were found at Graciosa, an islet off Tenerife.

The neck of an Almagro 51C amphora (which could be of the same date), found in the sea N. of Arrecife, on Lanzarote, was published by Serra Ràfols. This site is distinct, whether or not it is a wreck.

According to F. Foerster there is indeed at least one Roman shipwreck in the Canaries, although no firm details are known. One would expect some Roman ships to end up in the islands, especially on long fishing trips, even though (as seems to be the case) there was no Roman settlement there.

Serra Ràfols, 1966; 1970; García y Bellido, 1967.

Information: F. Foerster.

Cannes: see **Bataiguer**.

Canonnier du Sud: see La **Ciotat**.

**CAP BÉAR A** 169 Map 4 France

42° 31' N. 3° 8' E. Off Cap Béar, S. of Port-Vendres; in rocky gullies. Depth: 26 m.

Amphoras. c. 50 BC-AD 25 (?).

A cargo of Pascual 1 amphoras has been briefly reported; two stamps (saltire and **L.VOLTEIL**) have been found. Though mostly looted, the cargo was never large - not more than 50 amphoras. The cargo amphoras were made near Mataró.

Liou, 1975: 571; Liou & Pomey, 1985: 547; Liou, 1987b: 273.

**CAP BÉAR B** 170 Map 4 France

42° 31' N. 3° 8' E. 'Cap Béar 2'; detailed location not certain. Depth: 35 m.

Cargo uncertain. 2nd-3rd centuries AD.

A wreck off Cap Bear was seen in 1975, but has not been relocated. Perhaps as many as six iron anchors and a lead anchor-stock lay on hull timbers. A lamp of 2nd or 3rd century form was found.

Liou & Pomey, 1985: 547.

**CAP BÉAR C** 171 Map 4 France

42° 31' N. 3° 7' E. 'Cap Béar 3'; between Port-Vendres and Cap Béar. Depth: 40 m.

Amphoras. c. 50-25 BC.

A well-preserved wreck, found in 1982, was excavated in five successive seasons by D. Colls and the finders. The cargo comprised three main forms of amphoras. Lying on the ship's bottom (which was preserved) were over 160 (perhaps originally 200) Dr. 1B amphoras. Above them were some 20 Pascual 1 amphoras, stamped **BL**, **LICIN** and **[S]EMPR**. Also above the Dr. 1B amphoras, and to one end of the ship, were 16 Dr. 12 amphoras, containing fish-bones (as yet unidentified); they are closely similar to those of **Titan**. There were also a dozen amphoras of the 'Tarraconense 1' type; one was stamped **PMEVI**, a stamp known to have been used at Badalona. A lamp datable c. 40-30 BC confirms the date ascribed to the wreck on the basis of the cargo amphoras. Small finds included a stone identified as a touch-stone. The hull had an unusual form of mast step, a ceiling made up of planks alternating with stringers, no lead sheathing, and planking and frames assembled with sennits (bindings) alternating with wooden treenails. This is the first example of a stitched ship from the Roman period in the W. Mediterranean.

This ship, with its cargo of Italian, Baetican and Tarraconensian amphoras,

is a clear case of a transhipped, assembled cargo. Presumably the Pascual 1 amphoras were taken on at Barcelona or Badalona, destination Narbonne.

DRASM, 1983: nos 325-30; Liou & Pomey, 1985: 547-51; Colls, 1986; Liou, 1987b; Hesnard et al., 1988: 92.

**CAP BÉNAT A** 172 Map 5 France

43° 5' N. 6° 22' E. On the E. side of Cap Benat. Depth: 37 m.

Amphoras. c. AD 30-190 (?).

Only fragmentary amphoras remained at a much-looted site. The main cargo was of Beltrán 4B amphoras, with terracotta stoppers. A single amphora neck is of Ibizan type, and there is also a flat amphora-bottom. Neither small-finds nor timbers were discovered, and it is possible that the site represents jetsam, or at least a capsized; however, since the site is specifically known to have been intensively looted, arguments ex silentio are risky.

Cargoes of this amphora-form are rare; it is a pity that this one was so poorly preserved.

Calmes, 1973; Parker, 1977: 38 & fig. 12.

Information: R. Calmes.

**CAP BÉNAT B** 173 Map 5 France

43° 5' N. 6° 22' E. 'Cap Bénat 2'; not far from the cape, SE. of Cristaou rock. Depth: 43-46 m.

Amphoras and dolia. Late 2nd-early 1st century BC.

A Dr. 1C amphora wreck was much looted before its declaration in 1976. Besides the amphoras, there were also at least two dolia; one of these was raised, to reveal a profile different from the dolia found on other (later) sites such as **Diano Marina**. In the present case, the dolia did not constitute an important element of the cargo (or equipment). Pieces of timber were also found.

DRASM, 1985: 81; Tchernia, 1986: 138; Gianfrotta & Hesnard, 1987: 292.

**CAP BÉNAT C** 174 Map 5 France

43° 5' N. 6° 22' E. 'Cap Bénat 3'; scattered on a rocky bottom, S. of the cape. Depth: 54 m.

Amphoras. c. AD 1-50.

From a rather broken-up cargo of amphoras, two amphoras of form Laubenheimer G4 and one of Haltern 70 have been raised. Also found was a lead device, apparently a water-heater.

DRASM, 1983: no. 132; 1985: 70 & 101-2, no. 437; Pollino, 1984: 62-3.

**CAP BÉNAT D** 175 Map 5 France

43° 5' N. 6° 27' E. 'Bénat IV'; E. of Cap Bénat. Depth: 328 m.

Amphoras. c. 130-110 BC (?).

An unconcreted tumulus of Dr. 1A amphoras in deep water was discovered by a French naval midget submarine. In a further investigation with a submersible, several amphoras and three coarseware jars were recovered. The tumulus measured 15 x 5 m; two layers of amphoras and the tops of a third layer were visible, implying a cargo of at least 500.

Rieth, 1979; DRASM, 1983: nos 233-6; 1985: 51; Liou & Pomey, 1985: 566-7; Long, 1987b.

**CAP BLANC** 176 Map 3 Spain

39° 22' N. 2° 47' E. (approx.). Off Cap Blanc (Majorca). Depth: 50 m.

Amphoras. c. AD 295-325 (?).

Only indirect information is available about this deep wreck, said to be 'a few miles' from Cap Blanc. The cargo formed a low tumulus, 16 m long, on a sandy bottom; the ship's timbers were preserved, but were very fragile. The main cargo (70% of the amphoras) consisted of pear-shaped amphoras, form Almagro 51C; the rest were Afr. 2B-D, with a variety of rim-types. The Afr. 2 amphoras contained fish-bones and scales (apparently unidentifiable), and had (in at least one instance) been stoppered with a cork disc. One small amphora, form Beltran 72, is among the finds and may represent a consignment as well. Other finds included at least one terracotta 'vaulting tube'; it is not certain that there was a cargo consignment of such pipes on board. There were also, by report, a plate and a jar. The association of material in this shipwreck is closely paralleled at **Femmina Morta, Cabrera A** and other sites.

Llabrés, 1976.

Information: J. Llabrés.

**CAP BON A** 177 Map 1 Tunisia

37° 5' N. 11° 2' E. (approx.). Off Cap Bon; detailed location and depth not reported.

Amphoras. 1st century AD (?).

Amphoras of form Haltern 70 from a wreck somewhere off Cap Bon have been briefly reported.

Colls et al., 1977: 37.



**CAP BON B** 178 Map 1 Tunisia

37° 5' N. 11° 2' E. (approx.). Near Cap Bon; detailed location and depth not reported.

Amphoras. Late 1st century BC-1st century AD.

A wreck of Italian Dr. 2-4 amphoras has been summarily reported.

Tchernia, 1986: 151.

#### **Cap Bon: another site**

A large deposit of lead ingots was rumoured by sponge divers to lie off Cap Bon, according to Merlin, 1912: 385, note 5.

**CAP CAMARAT A** 179 Map 5 France

43° 12' N. 6° 40' E. At Cap Camarat, near Saint Tropez; at the foot of a reef. Depth: 25 m.

Amphoras. c. 100-25 BC.

A wreck with Dr. 1B amphoras has been briefly reported. An uncorroborated note (Carraze, 1970c) states that an ovoidal amphora ('primitive Dr. 10') came from the site (for this type of amphora, cf. **Capo Sant'Andrea B**).

Benoit, 1962: 169; Carrazé, 1970d; 1970f. The name 'Camarat 1' is given to **Nord-Camarat** by Pomey et al., 1989: 37.

**CAP CAMARAT B** 180 Map 5 France

43° 12' N. 6° 40' E. 'Cap Camarat 2' or 'Camarat 2'; in deep sand. Depth: 38 m.

Amphoras. c. 75-25 BC (?).

This wreck (discovered in 1968) had an unusual cargo, spheroidal amphoras (cf. Dr. 26). One bore a monogram stamp which has been read as **LAPO** (for L. Apolo(ni) ?). Amphoras of this form (for which cf. Hesnard, 1980: 148-51) are thought to have contained Venafran olive-oil from Campania. The cargo also included Dr. 1B and Lam. 2 amphoras. Among other finds were a black-gloss moulded jug, terracotta statuettes, and Roman bronze asses.

DRASM, 1983: no. 92; Amar & Liou, 1984: 182, no. 232; Liou & Pomey, 1985: 567-9; Hesnard et al., 1988: 155-6; Pomey et al., 1989: 37-8.

Cap Camarat: see also **Nord-Camarat**, **Sud-Camarat** and **La Roche Fouras**.

Cap Cartaya: see **Cap Taillat**.

**CAP COURONNE** 181 Map 4 France

43° 19' N. 5° 2' E. Off Cap Couronne; detailed location and depth not reported.

Pottery. c. AD 1450-1500.

A consignment of Valencian cobalt blue and metallic lustre bowls was found somewhere off Cap Couronne. The bowls are decorated with the crowns of the Kingdom of Valencia or other motifs, including inscriptions. No archaeological investigation of the site has been carried out.

Démians d'Archimbaud, 1971: 163 & fig. 30; DRASM, 1985: 115-6.

**CAP CROISSETTE** 182 Map 5 France

43° 12' N. 5° 20' E. At Cap Croisette, near Marseilles; detailed location and depth not reported.

Amphoras. 3rd-4th centuries AD (?).

A wreck with a cargo of African amphoras has been summarily reported. Only eroded necks or sherds are known from the site.

Lequément, 1976: 188.

Cap Croisette: see also **Maïre, Tiboulén**, etc.

**CAP D'ANTIBES** 183 Map 5 France

43° 33' N. 7° 8' E. On 'La Louve' or 'La Love' rocks, at the tip of Cap d'Antibes. Depth: 13-16 m.

Amphoras and pottery. c. 540 BC.

A relatively well-preserved Etruscan wreck, now looted, lay close to the treacherous reef. Some 180 amphoras have been found, out of an original cargo estimated at more than 600 amphoras. The amphoras originated from Etruria, and were probably loaded aboard at Vulci; some were stopped with cork discs, some had a rosin lining, while in others were found fish-bones. The quantity of oyster-shells (the lower valve) found scattered across the site suggests that these, too, had been part of the cargo. Also found were nearly 60 cups and jugs of Etruscan bucchero nero ware. Shipboard pottery comprised an 'Italo-Corinthian' cup and some coarseware, as well as a lamp of a form familiar from Punic sites.

A lead stock, found to one side of the site, is probably a stray, but a stone stock (stolen) and two fragmentary schist stocks are characteristic of the period. No timber or other remains of the ship were found; it cannot have been large - the site extends 12 x 18 m.

Benoit, 1956: 32-3; 1971a: 145-6; Pruvot, 1971; 1972; 1982; Albore Livadie, 1972; Gianfrotta, 1977: 287; Bouloumié, 1981.

**CAP DE CREUS** 184 Map 4 Spain

42° 19' N. 3° 19' E. (approx.). 'Cap de Creus I'; scattered along an underwater cliff-face. Depth: down to 20 m.

Amphoras. c. 50 BC-AD 25 (?).

A wreck of Pascual 1 amphoras has been summarily reported off Cap de Creus (Cabo Creus). For similar wrecks in this area, see **Cala Cativa**, **Cala Culip** and **Punta Blanca**. A short distance from the headland is an islet, and the channel between, Freu de l'Encalladora, is swept by strong currents in storm conditions, resulting in several wrecks.

Ametlla, 1957: 123; Nieto, 1986: 82; Liou, 1987b: 272.

Cap de Creus: see also **Cova del Infern**, **Masa d'Or** and **Piedra Negra**.

**CAP DE GARDE** 185 Map 1 Algeria

36° 57' N. 7° 48' E. At the foot of Cap de Garde. Depth: 4-15 m.

Amphoras. c. AD 285-365 (?).

Only cargo amphoras have been published from a scattered wreck N. of Hippo Regius. They are of Afr. 2D type; none is stamped. In eight recorded cases, one handle of the amphora had, wrapped round it, a lead label; all eight are different, but appear to refer to fish-sauce contents. The inscriptions in most cases identify the goods as **DE** (or **EX**) **OFFICINA** of masters named variously **L.IVLI ROMANI**, [ ] **MINVCI CREMIALIS**, **IVLIORVM** or **LIBERTORVM**. It is not stated whether there were any fish remains inside the amphoras when found.

Since no other labels attached in this way have been found, they may only relate to some local traffic, perhaps in reused amphoras; however, the cargo serves to highlight the relatively large proportion of Afr. 2 amphoras which contained fish-bones or were lined with rosin (and were therefore not used for carrying olive-oil).

Lequément, 1975; Gianfrotta & Pomey, 1981: 165.

Cap de l'Estérel: see **Estérel**.

**CAP DEL VOL** 186 Map 4 Spain

42° 21' N. 3° 10' E. Close inshore at Cap del Vol (or Volt), on the N. side of the bay of Port de la Selva. Depth: 24 m.

Amphoras. c. 10 BC-AD 5.

The main cargo was of Pascual 1 amphoras, pitched internally and stopped with a cork disc pierced at its centre. Some amphoras were stamped **S**, **H**, **L**, **QFS**, **M.PORC** or **IVLI.THEOPHIL**. Most of these amphoras were made at Badalona. The cargo had been substantially looted before excavations by F. Foerster began.

Pottery, both coarseware (including a jar full of some brown substance) and fineware (fine-wall jars and imitation Arretine made locally), dates the wreck closely to the turn of the era, perhaps before it (as Liou suggests). A coin

was found in the mast-step, but has not been published. Substantial remains of the ship, including the sternpost, have been excavated. Estimated at 18-19 m long, the ship had very flat floors and a heavily-worn keel, suggesting that she was a coastal and river or lagoon vessel, used in shallows and on beaches. Below the ceiling, branches of vine wood were packed between the frames, it is not known why; the inside of the planking was coated with a brown substance containing goat's hair. Parts of a pump, formed from discs mounted on a continuous rope which passed through a hollow wooden shaft, were also found and have been reconstructed. The mast step has a rabbet to receive the first ceiling plank - an unusual feature, since this plank at least is normally left free to give access to the well. The planking was fastened to the frames by nails and, alternatively, by treenails. Some lead sheets and an iron bar, possibly part of an anchor, were found inside the hull. It is hoped to reconstruct the lines of the hull.

Both cargo and shipboard items in this wreck are of local origin, and some of the ship's characteristics suggest a coasting vessel; the range of unusual construction features illustrates the variety of provincial vessels which must have existed in the Mediterranean even in the Roman period.

Foerster, 1980a; 1984; Nieto & Foerster, 1980; Nieto, 1982; Liou, 1987b: 272-3.

Information: F. Foerster.

**CAP GROS (COLLIOURE) 187 Map 4 France**

42° 31' N. 3° 6' E. Between Collioure and Port-Vendres (in SW. France). Depth: 17 m.

Amphoras. c. 50 BC-AD 25 (?).

A wreck with Pascual 1 amphoras was mostly looted in 1953; one amphora has been published, but no details of the ship or her cargo are known.

Gallet de Santerre, 1961: 217 & fig. 30; Liou, 1987b: 274.

**CAP GROS A 188 Map 5 France**

43° 33' N. 7° 9' E. 800 m SE. of Cap Gros. Depth: 54 m.

Amphoras. c. 100-50 BC (?).

A rather well-preserved low tumulus of about 200 visible amphoras was discovered in 1977, but was subsequently mostly destroyed by looters. Dr. 1B amphoras outnumbered Dr. 1C 20:1; there were also, it seems, some Dr. 1A, and fragments of what is described as a Dr. 20. The Dr. 1B amphoras bore stamps, including **SIND**, **ALEXA** and **ANTIGONI**. Other finds were a Camp. A cup, two coarseware jars, a mortarium, a small jar in Ampuritan Grey Ware and a lead jar. The bottom of the ship was exceptionally thickly covered with a layer of ballast stones, as high as the shoulder of the amphoras. The hull was well preserved, with planking of *Pinus sylvestris* and frames of *P. halepensis*. An important find was the bottom of the ship's pump, with the lower part of the two pipes for the disc-chain still in position; the pump seems small, and rather inefficient mechanically, for the ship, which must have been carrying 500 amphoras when she sank.

Pollino, 1983: 35; Joncheray, 1989a.

**CAP GROS B**    **189**    Map 5    France

43° 32' N. 7° 8' E. Approx. 700 m S. of Cap Gros; on a bottom uncovered and covered periodically by strong currents. Depth: 52 m.

Iron bars and grinding stones. 2nd-1st centuries BC ?

Over 100 iron concretions lie at the site; one raised was 35 cm long and 5 cm wide. Pottery of various dates has been found around the site; the bars generally resemble other Roman iron cargoes, such as Les **Mèdes A** or Les **Sorres A**, and a late Republican date can be proposed on this basis. Five mill-stones were also found, and are probably associated. No ship's structure has been seen.

Fiori, 1973; 1974b.

**CAP GROS C**    **190**    Map 5    France

43° 33' N. 7° 8' E. On a steep underwater slope at Cap Gros. Depth: 29 m.

Amphoras.    Mid-late 1st century BC (?).

A dense deposit of amphoras was discovered in 1991. The main type of amphora resembles Lam. 2 in being bag-shaped, but has a rolled lip and basal knob; these amphoras were closed with a terracotta stopper. There were also single amphoras of forms cf. Dr. 9, Dr. 2-4 and Pascual 1, suggesting that the main cargo came from Spain. Also on the site were three anchors, one of iron. An iron axe-adze was found, but no hull remains; the site may represent a partial upset, rather than a full-scale shipwreck.

Joncheray, 1991.

Information: C. Brandon.

**CAP GROS D**    **191**    Map 5    France

43° 33' N. 7° 8' E. At Cap Gros, near Antibes; 40 m from the coast. Depth: unknown.

Amphoras.    4th century BC (?).

A wreck of top-shaped, micaceous amphoras of Massiliot type was found in sand close to the land. No further investigation or other details have been reported.

Benoit, 1956: 33 & fig. 1. 4.

Cap Lardier: see **Sud-Camarat**.

**CAP LEUCATE A** 192 Map 4 France

42° 55' N. 3° 4' E. Near Cap Leucate; detailed location and depth not reported.

Amphoras. c. AD 1-275 (?).

A cargo of Dr. 20 amphoras has been only briefly reported.

Solier et al., 1981: 8, note 2, & cf. 260, note 377.

**CAP LEUCATE B** 193 Map 4 France

42° 55' N. 3° 4' E. Near wreck A; detailed location and depth not reported.

Amphoras. c. 50 BC-AD 100 (?).

A wreck with Dr. 2-4 amphoras of undefined type has been only summarily reported.

Solier et al., 1981: 8, note 2.

**CAP MAGROUA** 194 Map 1 Algeria

36° 25' N. 0° 49' E. E. of Cap Magroua; detailed location and depth not reported.

Amphoras. Roman period.

A brief reference to this site describes it as a wreck with amphoras containing fish-bones.

Benoit, 1961a: 50, note 6.

**CAP NEGRET** 195 Map 3 Spain

39° 0' N. 1° 17' E. North of Sant Antoni (Ibiza); close to the cape. Depth: 35 m.

Amphoras. c. 110-90 BC (?).

According to published reports, the ship wrecked at Cap Negret was in ballast; a number of boulders lay along the line of the keel. Allowing for the looting which had taken place prior to trial excavations by B. Vilar Sancho, somewhat over 50 amphoras were raised from the site, and these must represent a cargo consignment. The amphoras were of two forms: Mañá C2b and Dr. 1C. Other finds included a lead anchor-stock and a sounding-lead; the most interesting item, however, was a stamp of the type used to seal Italian wine amphoras. Made of wood, it was inscribed **Q.VERG.SCAE** around **L.L** (retrograde). Why it should have been on board the Cap Negret ship, one can only guess; perhaps such stamps were commonly carried on board to make good damaged seals or even create new ones. Unfortunately, the circumstances of its discovery in this case shed no light on the question. The keel and planking of the ship survived, though no

details are reported; the vessel's length is estimated at 12-14 m.

Fuller publication of this site and of the finds other than the stamp, though promised, has not materialized; more information might assist interpretation of the enigmas posed by this unusual wreck.

Company, 1971; Almagro & Vilar, 1973; Lusuardi Siena, 1977: 210; Ramón, 1981: 31-2; Guerrero, 1986: 172-3.

**CAP ROUX A** **196** Map 5 France

43° 26' N. 6° 56' E. 300 m SE. of Cap Roux. Depth: 38 m.

Amphoras. 4th century AD (?).

A wreck of late Roman cylindrical amphoras lay under sand off Cap Roux. No details of the site have been published.

Benoit, 1960: 53-4. (Joncheray, 1971: IX 2, may also belong).

**CAP ROUX B** **197** Map 5 France

43° 26' N. 6° 56' E. Off Cap Roux; 300 m offshore. Depth: 18 m.

Amphoras. c. 120-80 BC (?).

A wreck with amphoras of forms Dr. 1A and Lam. 2 was reported by Joncheray; the same site, which was also thought to have produced a 'Rhodian' amphora, was noted by Benoit. One of the Dr. 1A amphoras was stamped **SES**. An anchor-stock has also been found.

Benoit, 1960: 53; Joncheray, 1972a: 12; 1974c.

**CAP SICIÉ** **198** Map 5 France

43° 2' N. 5° 52' E. Near Les Deux Frères (after which it is also named), in the anchorage of Le Brus. Depth: 40 m.

Amphoras. c. 75-70 BC.

The main amphora cargo of this wreck (which has apparently not been investigated in detail) comprised ovoidal amphoras, similar to those of **flot Barthélémy** and **Capo Sant'Andrea B**. There was also at least one Lam. 2 amphora (thought by Carrazé to be of Campanian fabric). The wreck is well dated by a hoard of 20 silver denarii found on the wreck, closing with one of L. Rutilius struck in 75 BC.

Benoit, 1965b; Tchernia, 1969: 483; Dumas, 1972: 263; Carrazé, 1976a: 69-71; DRASM, 1985: 54 ('inédite').

**CAP SPARTEL** **199** Map 2 Morocco

35° 47' N. 5° 55' W. In the area of Cap Spartel (or Espartel), W. of Tangier. Depth not reported.

Lead ingots and other objects. c. 100 BC-AD 50 (?).

At least 40 lead ingots (with rounded top) lay in what was apparently a scattered wreck off Cap Spartel. The best-preserved ingot weighed 26 kg. There were also lead pipes of various diameters, a bar of lead, and an anchor-stock in poor condition, which might have been part of the cargo. No inscriptions were seen on the ingots. It is not clear from the published reports if there was any securely associated material; for discussion of these confused reports, see on **Tanger A & B**.

Ponsich, 1964: 262; 1966; cf. Euzennat, 1971.

**CAP TAILLAT** 200 Map 5 France

43° 10' N. 6° 39' E. In Bon Porté bay, 600 m NE. of Cap Taillat. Depth: 33 m.

Amphoras. c. 100 BC (?).

Only the hull now remains of a thoroughly looted site; some objects have been studied and published. The cargo originally comprised Dr. 1A amphoras, stopped with a cork and sealed with the mark **L.ASVI.MF** (Carrazé, 1975: no. 73-X-97) or **L.ASVI.NF** (Joncheray). It is possible that other Dr. 1A amphoras, including some stamped **EVA** on the shoulder, come from the same wreck (Carrazé, 1975: no. 70-X-14, etc.), but this has not been confirmed. Other finds, whether cargo or shipboard, were some cups and plates and a guttus in Camp. C ware, and various coarseware jars and bowls (one thickly lined with resin). There was a pair of mill-stones, a wooden pulley-wheel, some folded lead fishing-weights and a bronze coin (illegible). A bronze balance, inscribed **XV.S**, is of the same moving-fulcrum type as one found at La **Madrague de Giens**. Other utensils were a jar and a bowl of bronze and a simpulum (ladle) of silver. A small bar of lead with signs of melting at one end was doubtless for odd uses on board. There was an axe, and a sword and a broad spearhead of bronze. The ship carried at least three anchors, two of wood with lead stocks and one of iron.

Carrazé, 1970d; 1975a: 41-3; Joncheray, 1987b.

**CAPE AKRITAS** 201 Map 1 Greece

36° 43' N. 21° 52' E. In a cove by Cape Akritas, 30 m from the land. Depth: 5-10 m.

Amphoras. Date unknown.

Scattered fragments of amphoras (form not stated) lay between two ballast piles of river-worn stones. No other information has been published.

Papathanassopoulos, 1970: 145.

**CAPE ANDREAS A-F** 202-207 Map 1 Cyprus



35° 40' N. 34° 35' E. At the E. tip of Cyprus; a series of scattered deposits represents an uncertain number of wrecks.

**A. Roof-tiles. 8-18 m. 5th-mid 7th century AD ?**

Several bronze fragments, including part of a box, and a lead anchor reinforcement-collar were found among the tiles; two iron anchors of Byzantine type were found nearby. Green, site 12.

**B. Amphoras 7-9 m. 7th century AD ?**

This site lies approx. 110 m E. of wreck A. On its W. side are some tiles (thought to be from the 'cabin roof') and amphoras; the amphoras could be late Roman, but perhaps best resemble Riley LR 13, 7th century AD. To the E. was a densely concreted deposit of pottery (including a palmette & rosette stamped bowl), probably 3rd century BC. Some glass vessels (Roman or Byzantine) were also found. Green, site 16.

**C. Amphoras. 7-10 m. c. AD 450-650 (?).**

Byzantine baluster-shaped amphoras (Riley LR 1 & 1A) lay in substantial numbers at this site. Green, site 17.

**D. Amphoras. 9 m. 6th-4th centuries BC (?).**

Many loop-handles from 'basket-jar' amphoras lay in two dense heaps at this site. Green, site 19.

**E. Amphoras and terracotta sarcophagi.  
10-25 m. c. AD 450-650 (?).**

Byzantine baluster-shaped amphoras (and others, possibly stray) were found at this site, only 75 m E. of wreck C. There were also many fragments of terracotta sarcophagi. Green, site 24.

**F. Tiles. 20 m. Roman period.**

A well-preserved tile cargo lay buried in sand; visual and instrument surveys showed that the tiles were still stacked in position in the ship, and that (by implication) the hull lay beneath. Unfortunately it proved impossible to excavate this important wreck when it was discovered, and it is said that the site has now been stripped of its cargo by looters. Green, site 28.

Sites 1, 10, 14 and 15 are impossible to define as shipwrecks.

Although the 1969-70 survey by J.N. Green and his colleagues was thorough, there is an unconfirmed rumour that a shipwreck with amphoras and hull timbers has been found and looted within the survey area.

Green et al., 1970; Green, 1971; 1973.

Information: J.N. Green; D.M. Squire; C.S. Tonnar.

**CAPE GELIDONYA A**

**208**

Map 1

Turkey

36° 11' N. 30° 25' E. On a mostly rocky bottom, between two small islands close to Cape Gelidonya. Depth: 26-28 m.

Copper ingots and other cargo. c. 1200 BC.

The first underwater excavation by G. Bass took place in 1960 on the Bronze Age site first reported by P. Throckmorton. The cargo comprised over 60 copper ingots and a collection of bronze tools (mostly agricultural, but also spears, a mirror, and other household items) being carried as scrap. There were probably also ingots of tin, corroded to a white substance. Equipment for working metal consisted of a swage block, some whetstones, and a stone which could have been used as an anvil; there were, however, no moulds. The ingots and tools may have originated in Cyprus. Some pieces of crystal and a jar of glass beads were also probably items of trade. In renewed excavations (1987-8) were found some stone weights, metallic tin, bronze knives, a sword (the first weapon from the wreck) and two LM IIIB stirrup-jars, datable to the 13th century BC.

Thirty-five small fragments of the hull were found, enough to show that the planking was assembled with mortice-and-tenon joints. Over 100 kg of ballast stones were found, and there was dunnage (or possibly firewood) under the cargo. Personal possessions included a cylinder-seal, five Egyptian scarabs, three sets of weights, and a knucklebone; olive-pits and fish-bones represented meals on board. The ship appears to have been 8-9 m long; the home of captain and crew is disputed, but they could have come from Cyprus, like the cargo. The date may be later than 1200 BC, perhaps as late as c. 1150 BC, according to Giveon and Catling. The international character of the material (according to Muhly et al.) shows that trade in metals was in the hands of middlemen.

Bass, 1967 (& many other accounts). For discussions, see (eg.): McCann, 1970; de Vaux, 1970; Schaeffer, 1971: 546-60; Linder, 1972; Basch, 1972: 14; Tylecote, 1976; Muhly et al., 1977; Maddin et al., 1977; Giveon, 1985; Catling, 1986; Bass, 1986c: 269-72. Recent investigations: Bass, 1988; Pulak, 1988b.

Information: J.R. Steffy.

**CAPE GELIDONYA B** 209 Map 1 Turkey

36° 14' N. 30° 25' E. (approx.). S. of Kemer, near Cape Gelidonya; close to a cliff. Depth: 45 m.

Pottery. c. 50-25 BC.

A cargo of Eastern Sigillata A pottery lies on the border of rock and sand at the foot of a cliff. Of over 300 pieces looted from the site by German divers, a selection has been published, comprising plates, cups and small bowls, with various stamp-types. Larger plates are reported but have not been published. Apparently there was no other visible cargo; it is not clear whether the fineware could have made up a whole shipload.

Bass, 1974: 335-7; 1975, site F (no. 11); Mitsopoulos-Leon, 1975.

**CAPE GELIDONYA C** 210 Map 1 Turkey

36° 14' N. 30° 25' E. (approx.). Near wreck B, on bare rock. Depth: 46 m.

No surviving cargo (?). Date unknown.

A deposit of hearth tiles, 5 x 3 m in extent, represents the galley of a ship whose cargo has perished, rather than a small cargo of tiles. No hull timbers are preserved.

Bass, 1974: 337; 1975, site N (no. 12).

**CAPE GELIDONYA D** **211** Map 1 Turkey

36° 14' N. 30° 25' E. (approx.). Near wrecks B and C. Depth: 54 m.

Pottery. 13th-15th centuries AD (?).

A wreck with large quantities of Late Byzantine sgraffito pottery, looted, is rumoured to lie near Cape Gelidonya.

Bass, 1974: 337.

**CAPE KITI A** **212** Map 1 Cyprus

34° 48' N. 33° 37' E. On a reef, E. of Cape Kiti lighthouse, near Larnaca. Depth: 2 m.

Amphoras. 7th century AD (?).

Fragments of Byzantine amphoras, datable to the 7th, or possibly the 8th, century AD, lay in 'a fairly defined area', and very probably represent a scattered wreck.

Engvig & Aström, 1975: fig. 14, S56C; Engvig & Beichmann, 1984 (nos S-100 to S-123).

**CAPE KITI B** **213** Map 1 Cyprus

34° 48' N. 33° 37' E. In shallow water, SW. of Cape Kiti lighthouse. Depth not reported.

Amphoras. c. 10 BC-AD 40 (?).

Only one amphora has been published, from a probable wreck; 'it seems to have been a big ship which carried various goods on board'. The published amphora is of form Dr. 6A, stamped **T.H.B** (pace Engvig & Beichmann), datable in the late Augustan-Tiberian period (cf. Hesnard, 1980). The wreck is an interesting addition to our knowledge of the export of N. Italian goods at this period.

Engvig & Beichmann, 1984 (no. S-130 c).

#### Cape Kiti: other finds



A louterion and at least one amphora of unidentified form have been found at the site. The louterion is comparable with examples found in late 6th and 5th century BC contexts elsewhere. A lead fitting, with nail holes, in Naxos Museum also comes from this site.

Kapitän, 1979: 99-100 & 117, note 3.

**CAPO BELLAVISTA**

**218**

Map 6

Italy

39° 55' N. 9° 43' E. Close to Punta Nera, S. of Capo Bellavista, near Arbatax (Sardinia). Depth: 4-7 m.

Copper, tin and iron ingots. Late 1st cent. BC-early 1st cent. AD ?

Details have gradually emerged of the cargo (at one time thought to be Bronze Age) first reported by a fisherman in 1954. The copper ingots are of two shapes, discs (with stamps) and bars (similar to the common shape of Roman lead ingots). The tin ingots are similar to those from **Port-Vendres B**; of the six which now survive, one is stamped **MARO**. They vary in weight from 3 kg to 10 kg; some are of double-ingot shape, others single. The iron ingots appear to be of two forms: some are double-pointed, like 'currency bars' (Tylecote's Type I), while others are thick, flat bars. (The latter type are not reported by Tylecote, but appear in the photo published by Gianfrotta & Pomey). Unfortunately no associated material has been reported, and one can only assume that the wreck is from Spain and of the early Empire, like **Port-Vendres B** and **Sud-Lavezzi B**. For iron bars of this period, see **Benafelí** and **Gravisca**.

How much more valuable would be the information from this site had even a brief archaeological investigation been mounted when the site was first known; not only has much been lost from the wreck (especially copper ingots) but even the collection in Sassari Museum is lacking about half the original material. A proper survey of the site, now planned, is much needed.

Throckmorton, 1970a: 214-5; Lamboglia, 1972b: 448; Gianfrotta & Pomey, 1981: 188-9; Tylecote, 1982: 276; Tylecote et al., 1983: 73-4; Beagrie, 1985: 162-3; Penhallurick, 1986: 109; Lo Schiavo, 1986. (Tylecote and Beagrie associate with this site also the ingots of **Capo Testa B**, q.v.).

Capo Caldo: see **Punta Cera**.

**CAPO CARBONARA A**

**219**

Map 6

Italy

39° 5' N. 9° 31' E. Close to rocks on the E. side of Capo Carbonara (Sardinia); approx. 70 m from the coast. Depth: shallow.

Amphoras. 3rd-2nd centuries BC (?).

An amphora wreck has been only summarily reported. A photo shows what appear to be Graeco-Italic amphoras, of a type hard to parallel.

Fennell, 1974 (site 'b').

**CAPO CARBONARA B**

220

Map 6

Italy

39° 6' N. 9° 30' E. In SE. Sardinia; by a reef at the W. side of Porto Santo Stefano bay, approx. 500 m offshore. Depth: 10 m.

Amphoras. c. AD 200-275 (?).

An imperfectly reported wreck contained Afr. 1 amphoras; there was also at least one pottery 'vaulting tube'.

Fennell, 1974 (site 'd').

**CAPO CARBONARA C**

221

Map 6

Italy

39° 5' N. 9° 32' E. Between Capo Carbonara and Cavoli island. Depth: shallow.

Tiles. c. AD 30-70.

A wreck of wall-tiles (of two sizes) and pipes, stamped with a semi-circular stamp of Roman manufacture, was discovered off Capo Carbonara. The stamps read **M PROCILI MELEAGR** (Bloch, 1967, no. 363); semi-circular stamps date between the 30s AD and the end of Nero's reign (Steinby, 1978: col. 1496). It appears that the cargo was made up exclusively of tiles and pipes.

Zucca, 1987: 666, 673 & 676.

Information: A. Mastino.

Capo Carbonara: see also **Cavoli**.

**CAPO CIMITI**

222

Map 1

Italy

38° 57' N. 17° 10' E. Near Crotona (Calabria); close to the N. side of the cape. Depth: 5-7 m.

Marble columns. Roman period.

Five columns, 8 m long or rather less, and part of one more, lie approximately parallel on a rocky bottom close to land. No other material was found at the site. The columns are variously reported to be of green granite, white marble, or cipollino (green and white marble); the last identification is the most authoritative.

De Franciscis & Roghi, 1961; Pensabene, 1978.

Information: G. Kapitän.

**CAPO COLONNA**

223

Map 1

Italy

39° 1' N. 17° 12' E. Near Crotona (Calabria). Depth: 12 m.

Amphoras and pottery. 6th-4th centuries BC.



**CAPO ENFOLA**

227

Map 7

Italy

42° 49' N. 10° 15' E. Off L'Enfola, on the N. side of Elba. Depth: 35 m.

Amphoras.

c. 150-100 BC (?).

A wreck with a cargo of Dr. 1A amphoras is thought to lie off Capo Enfola. Two lead anchor-stocks and a copper nail were raised from the site, though no definite evidence for a wreck has been reported.

Zecchini, 1971: 34, fig. 15; 1982: 81 & 171, & pl. 76; Rossi, D. in Martelli et al., 1982: 63-4.

See also **Portoferraio**.

Capo Falcone: see **Punta Falcone**.

**CAPO FERRATO**

228

Map 6

Italy

39° 17' N. 9° 37' E. In Cala sa Figù, on the S. side of Capo Ferrato (Sardinia); a deposit of ceramic material extends 50 m out from the shore. Depth: less than 3 m.

Tiles.

Roman period (?)

Numerous roof-tiles lie close inshore; no stamps have been found. There are also fragments of amphoras strewn over the site; it has not yet been possible to identify or date these.

Gianfrotta & Pomey, 1981: 223; Mariottini, 1983.

**Capo Ferrato: another site**

Another site mentioned by Mariottini (1983), 100 m to the N., with finds including amphora fragments, copper sheeting, a bronze nail, a large iron ring with wood adhering, and many pieces of wood, is probably a modern wreck.

**CAPO GRANITOLA A**

229

Map 11

Italy

37° 33' N. 12° 40' E. W. of Punta Granitola (Sicily); 150 m from the shore.

Marble blocks.

c. AD 225-275.

A cargo of over 60 blocks, lying in shallow water, was surveyed by G. Purpura. The blocks, approx. 3 x 1 x 1 m, are in eight files; some salvage appears to have taken place in antiquity. The weight of the cargo is calculated at over 350 tonnes. The marble is white, from Proconnesus (Marmara); the blocks are of a trapezoidal form characteristic of the Proconnesian quarries. Among the blocks were some small pieces of pottery and the top of a Kapitån 2 amphora, probably of the mid 3rd century AD. An iron anchor and a large lead stock have



been found near the site. Lying between the blocks were some chips of marble, presumably the remains of earlier voyages (and thus evidence for specialized stone transport); these chips included verde antico, Parian, and an unidentified Asiatic marble.

Purpura, 1977; 1983a; Gianfrotta & Pomey, 1981: 219.

Information: S. Walker; K.J. Matthews.

**CAPO GRANITOLA B**                                  **230**                                  Map 11                                  Italy

37° 33' N. 12° 40' E. Near wreck A.

Amphoras, pottery and sulphur. 3rd-mid 2nd century BC.

Fragments of Graeco-Italic amphoras (of unidentified type), black-gloss ware, and sulphur ingots ('loaves'), together with some timbers, lie close to shore at Capo Granitola. Unfortunately only a summary report has been published.

Purpura, 1977: 58.

**CAPO GRANITOLA C**                                  **231**                                  Map 11                                  Italy

37° 33' N. 12° 40' E. Near wrecks A and B.

Pottery (?). c. AD 250-400 (?).

A summary report refers to a wreck with 'late Roman pottery' (possibly meaning amphoras rather than table or cooking ware) at Capo Granitola.

Purpura, 1983a: 46.

**CAPO GRANITOLA D**                                  **232**                                  Map 11                                  Italy

37° 33' N. 12° 40' E. (approx.). Said to be a few km from wreck A; detailed location and depth not reported.

Marble. Late Roman Empire period (?).

A cargo of Corinthian and Ionic capitals and plinths in white marble, veined blue, has been discovered on the coast near Capo Granitola. The marble is probably Asiatic, but its detailed identification and its date have yet to be firmly established.

Purpura, 1991: 137.

**Capo Graziano (Filicudi)**

The rich underwater deposits which lie around the Secca of Capo Graziano (a submerged rock pinnacle, rising to 2 m below the surface, on the E. side of the S. point of Filicudi) are now under special protection. The identifying letters used in the ensuing entries are those allocated by the CSAS, with additional sites (Lamboglia & Pallarés, 1983b).

**CAPO GRAZIANO A**

**233**

Map 11

Italy

38° 33' N. 14° 35' E. 400 m SE. of the Secca di Capo Graziano; among rock pinnacles on an underwater slope. Depth: 33-43 m.

Amphoras and pottery.

c. 160-140 BC (?).

A large, fairly well-preserved cargo of amphoras was first investigated archaeologically by G. Roghi in 1960. The amphoras (much looted) are thought to have numbered originally some 1,000 to 3,000; there are now 380 in the Museo Eoliano at Lipari. They are of two varieties of a form transitional between Graeco-Italic and Dr. 1A, with a strongly inclined rim of Dr. 1A type and a slender body of 'Entremont' type. They are classed as Graeco-Italic Type E by Will. Rosin-lined, they had mortar seals, impressed with seven circular stamps, and (by analogy with similar finds) most likely contained wine. The cargo also included a substantial consignment of Camp. B pottery (of which almost 700 pieces are in the museum), not just cups, but also plates, jars and bowls. The high quality of this early Camp. B ware is remarkable. There was also a quantity of plain ware, comprising jugs, jars with lids, flasks, dishes and mixing bowls.

To date this assemblage precisely is surprisingly difficult. Neither the amphoras nor the Camp. B pottery should, typologically, predate 150 BC by more than a decade or so. Four coins have been recovered from the wreck; all are Roman asses, of which one is datable 189-180 BC and the others are broadly similar. The date at which this group of coins was lost cannot be closely established, but it is reasonable to think it should be not much later than c. 150 BC.

The ship had at least four lead-stocked anchors, of which two (not in fact a matching pair) were found among the amphoras and are therefore securely dated. One is decorated with knucklebones, another with bosses (shells?), rings, a key and a dolphin. Only fragments of the hull survive, including some copper sheathing and 'a small conglomerate of burnt pottery and wood'. The ship has been estimated, on the basis of the extent of visible amphoras, at 21-25 m long. Two fragments of tegulae were found. The ship carried at least one rotary hand-mill (found on the wreck), probably two (another was confiscated from divers in the area). Stores and shipboard equipment are represented by a small Rhodian amphora, a grey-ware lamp, and a few pieces of Camp. A (plates and a cup). A graffito, **M.H** (in one case, **H.M**), occurs on two Camp. A plates and on several Camp. B pieces as well, showing that these, too, were in use on board.

M. Cavalier & M. Edmonds in Bernabò-Brea & Cavalier, 1985: 100-127. See also: Roghi, 1960; 1971; Kapitän, 1977; Morel, 1981: 63.

Information: G. Kapitän; S. Wignall; A. Tchernia.

**CAPO GRAZIANO B**

**234**

Map 11

Italy

38° 33' N. 14° 35' E. At the foot of the N. wall of the Secca di Capo Graziano; the 'relitto sotto i cannoni'. Depth: 32-35 m.

Amphoras. c. 325-275 BC (?).

Scattered Graeco-Italic amphoras (Will type A1) lie on the N. slope of the Secca di Capo Graziano. Cannon and other material from an 18th century wreck overlies the amphoras. There probably are more amphoras buried in sand lower down the slope. The amphoras resemble those of **Panarea (Roghi)**, and appear rather earlier than those of **Secca di Capistello**.

Kapitän, 1977a: 44-5 & 48; Bernabò-Brea & Cavalier, 1985: 88-9.

**CAPO GRAZIANO C** 235 Map 11 Italy

38° 33' N. 14° 35' E. Approx. 200 m S. of the Secca di Capo Graziano; less than 100 m from the coast. Depth: 35-44 m.

Amphoras. c. AD 1-10 (?).

Amphoras from a cargo of Augustan date lay scattered in the sand to S. of the Secca di Capo Graziano. The main cargo was of early Dr. 20 amphoras, exactly similar to one from La Longarina (Hesnard, 1980: pl. VI 1) and thus datable in the first decade of the Christian era. Terracotta stoppers were also found. An associated amphora (no. 9273), compared by Kapitän to form Haltern 70, actually seems to be transitional between late Republican ovoidal amphoras and the early Dr. 20 form; it is actually quite similar to Hesnard (1980), pl. VI 2. A Dr. 7 amphora certainly, Dr. 2-4 and horn-handled amphoras probably, belong to this wreck. A lead anchor-stock found 50m away may also have belonged.

This practically unexplored wreck could be of great interest for the history of Spanish exports.

Kapitän, 1977a: 47-51; Bernabò-Brea & Cavalier, 1985: 92-3.

**Capo Graziano D**

A 15th century BC stirrup-jar was found off Capo Graziano, but there is no other evidence for a wreck of this period.

Bernabò-Brea & Cavalier, 1985: 83.

**Capo Graziano E**

An 18th century AD cannon wreck, overlying wreck B.

Kapitän, 1977a; Bernabò-Brea & Cavalier, 1985: 98-9.

**CAPO GRAZIANO F** 236 Map 11 Italy

38° 33' N. 14° 35' E. Near wrecks A & B; on a gentle, sandy slope. Depth: 52-70 m.

Amphoras and pottery. c. 300-250 BC.

A well-preserved cargo of Graeco-Italic amphoras, standing three deep, and some 8-10 m in width, was partly excavated by N. Lamboglia in 1973-5. The amphoras are of Will's type A2, and have a black lining. Many of the 70 amphoras raised have a Greek stamp at the base of one handle; no complete stamps have been read. One Punic amphora (type Mañá B2) has also been found. A consignment of black-gloss pottery was on board, including cups datable to the period 300-250 BC, which may well have been made at Lipari. Shipboard items included two tegulae, coarse pottery and two lead anchor-stocks. An important find was the stand of a louterion, found on top of the amphoras at the W. end of the site and thus proving that such objects were installed on the ship's deck. The ship's hull was preserved; it was sheathed in lead.

Kapitán, 1979: 107-8; Will, 1982: pl. 85a (no scale); Gandolfi, 1982: 406; Lamboglia & Pallarés, 1983b; Bernabò-Brea & Cavalier, 1985: 88-91.

Information: G. Kapitán.

**CAPO GRAZIANO G** 237 Map 11 Italy

38° 33' N. 14° 35' E. Adjacent to wreck F. Depth: 45 m.

Amphoras. c. 450-425 BC.

A wreck with Corinthian Type A1 amphoras was reported by N. Lamboglia in 1975. An amphora of Type B, previously raised by sports divers, doubtless came from this site. An amphora foot of a different (unidentified) form, found on a shallow part of the Secca, may belong to the same wreck.

Kapitán, 1978: 274-5; Koehler, 1978: 236; 1979a: 29 & 45; Bernabò-Brea & Cavalier, 1985: 87.

**CAPO GRAZIANO H** 238 Map 11 Italy

38° 33' N. 14° 35' E. Approx. 300 m WNW. of the Secca di Capo Graziano. Depth: 35-40 m (?).

Amphoras. c. 100-50 BC (?).

A well-preserved wreck with amphoras of form Lam. 2 lies some distance to N. of the main wreck zone. The amphoras are similar to the Lam. 2 amphoras of **Albenga**, which suggests a date in the first half of the 1st century BC. Three lead anchor-stocks were found, and two were raised; it is possible that they do not really belong to this wreck. One is decorated with knucklebones, the other with a lamp and four shells (?) on each arm. There were also tegulae at the site.

Kapitán, 1977a: fig. 1, no. 7; Bernabò-Brea & Cavalier, 1985: 94-5.

**CAPO GRAZIANO J, K & L** 239-241 Map 11 Italy

No detailed information is available about three more wrecks near the Secca di Capo Graziano. Two are below wreck F, in approx. 50-80 m; one of these is

known as 'L'Embolia di Ferrandi'. The third, according to another diver, lies just outside the present archaeological protection zone.

Information: G. Kapitän.

**CAPO GRAZIANO M** 242 Map 11 Italy

38° 33' N. 14° 35' E. On the SW. side of Capo Graziano, on a steep slope; 'Kapitän 1977, rinvenimento 1'. Depth: 30-35 m.

Amphoras. c. AD 150-250 (?).

Fragments of Afr. 1 amphoras lay scattered on a rocky slope. Other fragments found at the site are of uncertain form, but might be Afr. 2A. No trace of a hull has been found, but the lower slope remains archaeologically unexplored.

Kapitän, 1977a: 41-2; Bernabò-Brea & Cavalier, 1985: 86 (suggesting the site was not a wreck but an anchorage).

**CAPO GRAZIANO N** 243 Map 11 Italy

38° 33' N. 14° 34' E. Detailed location, depth and cargo unknown.

A Roman wreck is known to exist W. of Capo Graziano, but no details are available.

Information: G. Kapitän.

#### **Capo Graziano: supposed wreck**

Surveys in 1968 and 1975 found a handful of late Roman objects at a depth of 38-42 m, 250 m S. of the Secca di Capo Graziano. The published reports include the top of an amphora of form Keay 61 (no. 9237) which was found some 300 m away. The remaining finds (which are in any case contaminated by an early Roman anchor and a modern deadweight) can be regarded as broadly of the period c. AD 400 (the date assigned to a strainer-jar by Tortorella), but the small quantity and lack of multiple items cannot substantiate claims of shipwreck status for the site.

Kapitän, 1977a: 45-9; Tortorella, 1981: 368; Bernabò-Brea & Cavalier, 1985: 97-8.

**Capo Graziano:** for a general appraisal and some other stray finds, see Bernabò-Brea & Cavalier, 1985: 81-6.

See also **Filicudi Porto**.

Capo La Secca: see **Maratea**.

**CAPO MELE** 244 Map 7 Italy

43° 56' N. 8° 10' E. Off Capo Mele (or Capo delle Mele), near Albenga; detailed location and depth unknown.

Amphoras. Mid 2nd century BC.

Four amphoras, brought up by fishermen, probably represent a wreck. They are of the earliest type of form Dr. 1.

Lamboglia, 1952c: 230-2; Carrazé, 1970c. Lamboglia notes other amphora finds from this area, which might have come from wrecks.

**CAPO PASSERO** 245 Map 11 Italy

36° 41' N. 15° 9' E. At Capo Passero (Sicily); close to the N. side of the island which forms the cape. Depth: 10-12 m.

Tiles. c. AD 400-650 (?).

The remains of a cargo of roof-tiles lies, broken up, among rocks in shallow water. Part of an unidentified Byzantine amphora gives the date; there must once have been more amphoras and tiles at the site, which is known to fishermen and divers. The tile fragments are scattered over an area 20 x 36 m. Some iron concretions are visible on the site.

Surveyed by the writer. Unpublished. Information: G. Kapitän.

**CAPO PLAIA** 246 Map 11 Italy

38° 1' N. 13° 56' E. W. of Cefalù (Sicily); close to shore on the W. side of the headland. Depth: 1 m.

Amphoras. c. AD 200-275 (?).

Many fragments of Afr. 1 amphoras lie among the rocks close to Capo Plaia. A smaller number of Tripolitanian amphoras were also found. Other finds consisted of a jug and a small grinding-stone. The date of the wreck may be earlier than that suggested here.

Purpura, 1975: 81-3.

**CAPO RASOCOLMO A** 247 Map 11 Italy

38° 17' N. 15° 21' E. W. of Capo Rasocolmo (Sicily); on a sandy bottom. Depth: 8 m.

No cargo. c. 36 BC.

The wreck of a ship which had been burnt, leaving no wooden remains, was investigated in 1991 by G.M. Bacci and Aquarius. The lead sheathing had melted and then re-solidified under water; nails and plated bolts lay everywhere on the site. Millstones, presumably for ballast, lay along the ship's axis; there were 15 stones (more *metae* than *catilli*), some broken, all used (with pivot and handle of metal). A bronze feature, not yet completely understood, lay at the NW. end of the site and appears to be a mooring device of some kind, thus marking the bow of the ship. Nine hooks or cleats of bronze lay along the probable line of the bulwarks; other finds included an iron anchor, a movable lead anchor-stock with astragali, a pulley, a ring, an inscribed lead ingot (not yet read) and 100 lead slingshots (one inscribed). Thirty-four coins were found, scattered, but mostly forward; they were Roman and other denarii, asses and semisses, dating from 42/40 BC to the mid-30s BC. There was also a lunate bronze plate (23 cm across) with an inscription which can be read (with some reserve) as **CN IMP.MAGNVS**. The wreck must certainly represent a small galley of the Civil War period, no doubt on the side of Sextus Pompeius.

Unpublished.

Information: G.M. Bacci; A. Freschi.

#### **CAPO RASOCOLMO B**

**248**

Map 11

Italy

38° 17' N. 15° 31' E. Near Capo Rasocolmo (or Rosocolmo), Sicily. Depth: unknown.

Amphoras.

c. 450-400 BC.

A wreck with Greek amphoras is known from divers' reports. The main amphora form present is unidentified; there is also at least one Corinthian Type B amphora, whose profile indicates the date.

Koehler, 1979a: 45.

Information: G. Kapitän.

#### **CAPO RASOCOLMO C**

**249**

Map 11

Italy

38° 17' N. 15° 31' E. Near Capo Rasocolmo; detailed location and depth not reported.

Amphoras.

c. 150-75 BC (?).

A Dr. 1A wreck at Capo Rasocolmo was mentioned in discussion by a local diver in October 1991.

Unpublished.

#### **CAPO RIZZUTO**

**250**

Map 1

Italy

38° 54' N. 17° 4' E. (approx.). Near Isola di Capo Rizzuto (prov. Catanzaro); off Marinella (not located). Depth not reported.

Cargo not reported. Roman (?).

The wreck of a ship, thought to be Roman, has been summarily reported.  
Gandolfi, 1985b: 667.

**CAPO SAN ALESSIO** 251 Map 11 Italy

37° 54' N. 15° 21' E. Near Capo San Alessio (Sicily), on a sandy bottom swept by changing currents. Depth: 50 m.

Amphoras. 2nd-3rd century AD (?).

A well-preserved cargo of small base-ring amphoras, cf. form Panella 46, was discovered in 1991 by the Archeoclub Santa Teresa di Riva.

Unpublished.

Information: G. Moschella.

**CAPO SAN VITO** 252 Map 10 Italy

40° 25' N. 17° 13' E. Near Capo San Vito (Taranto); detailed location and depth not reported.

Amphoras. Roman period.

Only summary information is available of a Roman wreck with a large cargo of 'oil amphoras' and a lead-stocked anchor.

Gandolfi, 1983: 286 (from a press report).

**CAPO SANT'ANDREA A** 253 Map 7 Italy

42° 48' N. 10° 7' E. At Capo Sant'Andrea, Elba; on a reef near the shore. Depth: 8-10 m.

Amphoras. c. 60-35 BC.

Several irregular layers of Dr. 1B amphoras lay in shallow water. They were lined internally, and one amphora bottom held a black sediment. Many of the necks retained their seal, with the names **M.FVR.VIN(ICI)** and **C.VIBI[ ]**. The amphoras are very similar to those of La **Madrague de Giens**; some are said to be inscribed (stamped ?) **R** on the belly. It seems probable that Dr. 1B amphoras were the only kind on board this particular wreck.

Shipboard items included the two parts of a rotary hand-mill, a bronze bucket-handle, a bronze saw, and other tools. A single broken tile was also found. Timbers, assembled with the aid of copper nails, were also found, but these disappeared after they were raised.

Lamboglia, 1959: 315; Pederzini, 1971: 195-204; Zecchini, 1971: 81-4; 1982: 95-7 & pl. 26; Rossi, D. in Martelli et al., 1982: 71-2.



**CAPO SANT'ANDREA B**

254

Map 7

Italy

42° 48' N. 10° 8' E. 193 m N. of the cape. Depth: 44-49 m.

Amphoras.

c. 125-100 BC.

A well-preserved cargo of Dr. 1 and ovoidal amphoras, lying in a soft seabed, was partly excavated by British sports divers. The Dr.1 amphoras were of types A, B and C; the ovoidal amphoras bear a strong resemblance in details to the Dr. 1 amphoras. (For similar ovoidal amphoras, see **Cap Sicié** and **flot Barthélémy**). Amphoras of all types were inscribed on the shoulder with graffiti - numerals, ranging from **XLIIII** (43) to **LXVIS** (66½). In one amphora the cork bung was preserved in place; inside was a yellowish fluid, described as 'not seawater'. Inside another amphora were large quantities of fish-bones.

Both fine and coarse pottery was found, but not enough to suggest that it was cargo. The coarseware included a flask, a pitcher, and a small jar. The fine pottery was black-gloss ware, described by Maggiani as Camp. A, but in the present writer's view more like 'imitation' Camp. B. It included three spouted strainer-jars, three plates, a small bowl and a cup. This pottery group clearly indicates a date in the last quarter, possibly the last decade, of the 2nd century BC. Of the ship's equipment there were found a pair of hand-mill stones, a lead anchor-stock and a sounding-lead. Concretions found in the bottom of the ship contained a large lead ring, a wooden pawl, and (in impression) an iron adze; a small piece of rolled-up lead was also doubtless for use on board. A wooden cylinder (18 cm long x 10 cm diameter) could have been part of a pump, or even of the rigging. In the hull were found two large bundles of small wooden rods, thought by the excavators to be for packing the cargo, but possibly in fact spare treenails. A large, pipe-shaped concretion might have been part of the bilge-pump system. Odd finds included some fragments of bone, and a bronze handle, perhaps from a mirror. An area of the ship 5 x 3 m was partly cleared, but its structure could not be studied in detail. The excavators thought that they were working amidships, so a large fore-and-aft timber, overlying the floors, which was found at one end of the trench must have been the mast-step. The ship was of modest size.

The excavations were not carried to a conclusion, partly because of the depth of the site; nonetheless, the remarkable amount of information won by the diving team (who were supervised by G. Brambilla and inspired archaeologically by I. Drewett) is in sharp contrast with the disastrous losses suffered at many similar sites in the western Mediterranean.

Maggiani, A. in Martelli et al., 1982: 72-9; Zecchini, 1982: 83-95 & pls 22-25.

Information: I.J. Drewett.

**CAPO SANT'ELIA**

255

Map 6

Italy

39° 10' N. 9° 9' E. (approx.). Near Capo Sant'Elia (Sardinia); detailed location and depth not reported.

Cargo ?

Roman period (?).

A 'cargo ship' has been summarily reported.

Zara, 1984.

### Capo Schisò (Italy)

Nine Roman hand-mills from the sea at Capo Schisò, the promontory on which stands the site of Naxos, are not stated to be from a wreck, though this is possible.

Unpublished.

**CAPO TAORMINA** 256 Map 11 Italy

37° 50' N. 15° 18' E. At the foot of cliffs on the tip of Capo Taormina (Sicily). Depth: 21-28 m.

Marble columns and blocks. Roman Imperial period.

The cargo consisted of 37 columns and two blocks of green marble, which could not be attributed to a source. The weight of the original cargo is estimated at 90-100 tons; at this depth, salvage must have been difficult, if not impossible, in antiquity. A copper bolt with a square plate at its end was the only piece of ship to survive; a sounding-lead was also found. The wreck is said to be 'roughly of Hadrianic date' by Van Doorninck, but no evidence is given.

Kapitän, 1961; 1971; Van Doorninck, 1972: 138.

**CAPO TESTA A** 257 Map 6 Italy

41° 14' N. 9° 8' E. (approx.). At an unspecified location near Santa Teresa Gallura (Sardinia); close to the coast. Depth: 16 m.

Amphoras. c. AD 1-75 (?).

A heavily-concreted cargo of amphoras lay on a rocky bottom. The amphoras have been compared with form Dr. 9, though an underwater photo appears to show Haltern 70 amphoras. Several necks retained a clay stopper or seal in position. Only one type of amphora was found. Other material includes a brown glazed dish and two lead plates. A couple of copper nails are apparently the only visible trace of the ship.

It is unusual for an early Imperial Spanish cargo to contain only one form of amphora (but cf. **Cabrera D**). A Baetican amphora similar to Dr. 9 appears in a photo published in 1978, and may be from this wreck.

Loppel, 1972; 1978: 54.

Information: G. Kapitän; P.R. Arthur.

**CAPO TESTA B** 258 Map 6 Italy

41° 13' N. 9° 8' E. The 'relitto del ferro' of Capo Testa. Depth: 28 m.

Iron bars. c. 75-25 BC (?).

A wreck with a cargo of iron bars which extended 18 x 8 m was surveyed by the CSAS. Apart for the iron (which has not been studied or published in detail), there were four ingots of lead, of Spanish type, two bearing the mould-mark **C.VTI.C.F.MENEN** and two marked **CN.ATELLI.CN.L.BVLIO**. Shipboard equipment included both parts of two rotary mills, a bronze helmet, one or more sounding-leads, and anchors - two with a lead stock and one made of iron. Other shipboard material included an amphora fragment (Dr. 1B ?), part of a dolium, and some coarseware. Crumpled lead sheathing, bronze nails and a large bronze keel-bolt are all so far discovered of the ship's structure.

Gianfrotta & Pomey, 1981: 188-9; Gianfrotta, 1981b: 237; Picozzi, 1984a; Gandolfi, 1985a.

Information: R. Ferrandi (via G. Kapitän); F. Lo Schiavo (via R.F. Tylecote).

**CAPO VITE** 259 Map 7 Italy

42° 52' N. 10° 24' E. 1 mile NW. of Capo Vite (or Vita), the N. point of Elba, on a mud bottom. Depth: 72 m.

Pottery. 14th-15th centuries AD (?).

Scattered on the face of an underwater reef and on the mud at its foot were pottery, metal sheaves and timbers from a late medieval wreck, recovered by fishermen.

Zecchini, 1971: 144-8 & 184, & fig. 61. (Not mentioned by Martelli et al., 1982).

**CAPO ZAFFERANO** 260 Map 11 Italy

38° 6' N. 13° 32' E. At Capo Zafferano (Sicily); detailed location and depth not reported.

Cargo not reported. c. 300-150 BC (?).

A 'Hellenistic site' has been summarily reported.

Purpura, 1991: 139.

**CAPRAIA A** 261 Map 7 Italy

43° 3' N. 9° 50' E. (approx.). On the NE. side of Capraia (Tuscan Islands). Depth: 35 m.

Amphoras. 1st century BC-1st century AD (?).

What was evidently a well-preserved wreck is said to have had a cargo of over 500 'wine amphoras' of the 1st century BC or AD 'still in the hold'.

Zecchini, 1971: 55 & 197. (Not mentioned by Martelli et al., 1982).

**CAPRAIA B**                                      **262**                                      Map 7                                      Italy

43° 4' N. 9° 49' E. At Le Formiche rocks, off Punta Teglia, the N. point of Capraia. Depth: 30-50 m.

Amphoras.                                      Roman period.

A 'field of amphoras' at Le Formiche recently yielded amphoras and pottery, not yet available for report.

Zecchini, 1971: 55 & 195; Cocchi, D. in Martelli et al., 1982: 86.

**CAPRAIA C**                                      **263**                                      Map 7                                      Italy

42° 59' N. 9° 48' E. Off the S. point of Capraia. Depth: more than 100 m.

Works of art.                                      Date unknown.

Unreliable reports assert that bronze and marble statues, together with timbers, have been brought up in fishing-nets S. of Capraia. See also **Capraia D**.

Zecchini, 1971: 54-8 & 197. (Not mentioned by Martelli et al., 1982).

**CAPRAIA D**                                      **264**                                      Map 7                                      Italy

43° 0' N. 9° 48' E. (?). At Capraia; detailed location and depth not reported.

Marble blocks.                                      Roman Imperial period (?).

A summary reference to a cargo of marble off Capraia has been published. This might turn out to be the same wreck as Capraia C. It may also be the site mentioned by Monaco (1965: 276-7) 'blocks of marble, possibly ancient, found in the sea'.

Gianfrotta, 1981a. (Not mentioned by Martelli et al., 1982).

**CAPRAIA E**                                      **265**                                      Map 7                                      Italy

43° 4' N. 9° 50' E. NE. of Punta della Teglia, N. Capraia. Depth: 52 m.

Pottery.                                      11th-15th centuries AD (?).

A brief reference to a find of pottery bowls of the medieval period implies they are from a shipwreck.

Cocchi, D. in Martelli et al., 1982: 86.

**CAPRERA**                                      **266**                                      Map 6                                      Italy

41° 14' N. 9° 27' E. At Punta Galera, the N. point of Caprera island (Sardinia). Depth: not reported.

Amphoras. 2nd century AD (?).

A wreck of Dr. 20 amphoras had already been thoroughly looted by 1966. To judge from a photo, the amphoras were of 2nd century type. The location of this wreck was only approximately reported, but it probably is the same as the site summarily mentioned by Carrazé.

Freiher, 1976; Carrazé, 1971a.

**CARQUEIRANNE** 267 Map 5 France

43° 5' N. 6° 0' E. W. of Cap de Carqueiranne (Toulon Roads). Depth: 52 m.

Amphoras. c. 75-25 BC (?).

A wreck with Dr. 1B amphoras, well-preserved (albeit damaged by trawling), was stripped by looters before excavations were authorized. The amphoras were of at least four varieties. Some were stamped (on lip, shoulder or belly); recorded stamps are **METRVS.TCL.CS** (in a circle; difficult to read) and **DEMENO**, a stamp found also at **Dramont A**. At least one amphora had a freehand signature on its belly. Other finds included two small, flat-bottomed amphoras (looted), a lead pot, a mortarium (without grits), a lid, and both stones of a rotary hand-mill. No information about the ship's hull exists, though some lead piping is known to have been found.

Carrazé, 1974b; 1976b.

**CARRO A** 268 Map 4 France

43° 19' N. 5° 2' E. Near Cap Couronne; 300 m from the coast. Depth: 5 m.

Amphoras. c. AD 525-550 (?).

A 'ships' graveyard' produced amphoras (not identified) and a t.s. chiara dish, datable to the 6th century AD. A lead bar and a lead stock or ingot may not be associated.

Benoit, 1962: 152; Hayes, 1972: 159.

**CARRO B** 269 Map 4 France

43° 19' N. 5° 2' E. 'Carro 2', S. of Les Ragues de l'Arnette, Cap Couronne. Depth: 12 m.

Amphoras. Late 2nd-early 1st century BC.

A wreck with many fragments of Dr. 1A amphoras, contaminated with modern pottery, was declared in 1968 and recently confirmed.

Pomey et al., 1989: 25.

**CARRO C** 270 Map 4 France

43° 19' N. 5° 2' E. Detailed location and depth not reported.

Amphoras. c. AD 1-275.

A wreck with amphoras of form Dr. 20, summarily reported in 1971, has not been mentioned since.

Carrazé, 1971a.

**CARRY-LE-ROUET** 271 Map 4 France

43° 19' N. 5° 9' E. In the outer harbour of Carry-le-Rouet (B.-du-Rhône).  
Depth: 6 m.

Stone blocks. Late 2nd-early 1st century BC.

A closely-packed deposit, 10 m long, of large squared stones lay under a tough bed of sea-grass, and has been surveyed by the DRASM. The 24 stones, weighing over 1 ton apiece, averaged 1.6 x 0.6 m in size. They were mostly inscribed with a Greek monogram, **AP**, and the central stone was marked **ΓAP**. Similar marks are to be found on the Hellenistic walls of Marseilles. In the case of the wreck, the stone comes from the quarry of Ponteau (12 km WNW.). Some of the stones have been raised, to reveal some shipboard material (a Dr. 1A amphora, Campanian ware and coarse pottery, and a stamped brick); underneath is the hull, which has strakes 5 cm thick and external lead sheathing.

DRASM, 1983: frontispiece; 1985: 55-6; Kainic, 1986.

**CARTAGENA A** 272 Map 2 Spain

37° 36' N. 0° 59' W. From the harbour of Cartagena; found in dredging.

Lead ingots. c. 50 BC-AD 50 (?).

About 50 ingots were found (by report, all together) during dredging in 1878. A list, published by Beltrán, includes some ingots (such as one marked **L.PLANI.L.F**) which must be of the Republican period, while others (eg. one marked **COLON.AVGVSTI.FERM**) must be Imperial in date. An ingot, seen by Domergue and illustrated by Más, is pyramidal, not convex, in section, is larger than a Planus ingot from **Cartagena B**, and has a mould-mark name with a third element, all of which suggest an early Imperial date: the mould-mark is **M.RAI.RVFI** - caduceus - **FER**. Another ingot, marked **P.NONAE.P.F.NVC.**, is illustrated by Mas. About 30 ingots inscribed **P.ROSCIEIS.M.F.MAIC** are said to have been found, but these have not been studied in detail. It thus seems likely that a cargo of lead ingots was indeed lost in the harbour in the Roman period, but its date and exact nature are unfortunately not possible to reconstruct.

Beltrán, A., 1947: 203-4; Domergue, 1966b: nos 11 & 31; Más, 1972: figs 67-8.

**CARTAGENA B**

273

Map 2

Spain

37° 36' N. 0° 59' W. In the outer harbour of Cartagena; depth not reported.

Lead ingots.

1st century BC.

Naval divers recovered 15 lead ingots in 1962-3, together with part of a Campanian plate. Thirteen bear the mould-mark dolphin - **C.AQVINI.M.F.** - anchor, one **L.PLANI.L.F** - dolphin - **R[VSSINI]**, and one **C.FIDVCI.C.F** - **S.LVCRETI.S.F.** The last two are illustrated by Más, and it can be seen that they are closely similar, and of normal late Republican form. No other information about this probable wreck has been reported.

Domergue, 1966b: nos 14 & 16-28; 1984: 209; Más, 1972: figs 67-8.

**Cartagena: other sites**

A ship, supposed to be ancient, was found in Cartagena harbour in the 18th century, but no detailed account is known of it (Ripoll, 1961a: 21).

A variety of amphoras, found in recent decades, can scarcely come from a single wreck, despite a wreck entry by Beltrán (1970: fig. 149).

For other wrecks in this area, see **Escolletes**, **Escombreras**, **Esculls** and **Punta de Algas**.

**Carthage (Tunisia)**

A large sandstone slab, found resting on a wooden beam in the rectangular harbour of Carthage, was thought to be lying in a sunken barge, but this has not been confirmed in a later report.

Stager, 1977: 200; Wolff, 1986.

**CASSIDAIGNE**

274

Map 5

France

43° 8' N. 5° 32' E. Near the reef of Cassidaigne (off Cassis); 90 m NNW. of the beacon. Depth: 19-35 m.

Amphoras.

1st century BC (?).

A good deal of material has been raised from near Cassidaigne reef, but it is difficult to define the number of wrecks which may be represented by it. A cargo of Dr. 1B amphoras seems likely (Benoit, 1962); several Coan amphoras, with Greek stamps (Liou) and even the amphoras described as Dr. 44-45 (Benoit, 1960) might also belong, but without any site records such an association can be only hypothetical. In any case, Etruscan amphoras and amphoras apparently of late Roman date have also been found.

Benoit, 1960: 43; 1962: 165-6, no 18; Liou, 1975: 584-5.

**CASSIS** 275 Map 5 France

43° 11' N. 5° 30' E. West of Cassis; at Pointe Cacau, between Port-Miou and Port-Pin. Depth: 35 m.

Amphoras. 1st century BC.

A wreck of Dr. 1B amphoras near Port-Miou was briefly reported by Benoit (1962) and Carrazé; perhaps it is the same site which was mentioned by Benoit (1960) as at (not near) Port-Miou. Two wrecks are listed by Fonquerle, but his information appears to derive from Benoit.

Benoit, 1960: 43; 1962: 164-5, no. 17; Carrazé, 1970d; Fonquerle, 1972: 58.

Cassis: see also **Cassidaigne** and **Port-Miou**.

**CASTELLAMMARE DEL GOLFO** 276 Map 11 Italy

38° 3' N. 12° 53' E. (approx.). Off Castellammare (Sicily). Depth: 60-70 m.

Pottery (?). 15th century AD.

A wreck with 15th century Pisan pottery has been reported from deep water off Castellammare del Golfo. Documents record the loss of a grain-ship hereabouts in 1487.

Purpura, 1986: 147, no. 51.

**CASTELLARE DEL PORTO** 277 Map 7 Italy

42° 21' N. 10° 55' E. At Castellare rock, near Giglio Porto (Tuscan Islands). Depth: 15 m.

Amphoras. c. 200-150 BC (?).

Around the rock of Castellare lay masses of amphora fragments, of Graeco-Italic form, said to be the same type as **Chrétienne C** (Will Type C). Associated with the amphoras was some black-gloss ware.

McKee, 1968: 116-7; Rendini, P. in Martelli et al., 1982: 51.

Castelldefels: see Les **Sorres**.

Castelrosso: see **Kastellórizon**.

**CASTELSARDO** 278 Map 6 Italy



40° 55' N. 8° 42' E. Near Castelsardo (Sardinia); detailed location not reported. Depth: 12 m.

Cargo not reported. 2nd century AD (?).

A probable wreck of the 2nd century AD near Castelsardo has been summarily reported. There might be some confusion with (eg.) **Cala Ustina B.**

Gandolfi, 1985b: 680.

**CASTILLO** 279 Map 2 Spain

37° 48' N. 0° 44' W. (?). 'El Pecio Castillo', near San Pedro del Pinatar (Murcia); location and depth not reported. The wreck is named after someone killed in a diving accident.

Amphoras. 1st century AD.

Only brief details have been reported of an early Imperial wreck with a cargo of fish-sauce amphoras; some were of form Beltrán 2A.

Más, 1985a: 164-5 & fig. 6. 1.

**CATALANS, LES** 280 Map 5 France

43° 17' N. 5° 20' E. West of Les Catalans pier, S. of Marseilles. Depth: 41 m.

Amphoras. Mid 4th century AD (?).

A cargo of five kinds of amphora comprised two types of form Almagro 51A, form Dr. 23, cylindrical, and Beltrán 72 amphoras. One Almagro 51A amphora contained remains of mackerel. Unfortunately, no dating evidence was found. No remains of the ship have been reported. A number of bricks were found, and even a piece of wall, with four courses of bricks laid in tile mortar; this might have been ballast, or (perhaps more likely) part of a cooking hearth.

Liou, 1973: 585-6.

**CATTOLICA** 281 Map 8 Italy

44° 10' N. 12° 50' E. (approx.). Between Gabicce and Cattolica, not far offshore; detailed location and depth unknown.

Amphoras. c. 100-25 BC (?).

Fishermen's finds off the Adriatic coast indicate that there is at least one wreck of Lam. 2 amphoras near Cattolica.

Dolci et al., 1986: 4-11.

Cavalaire: see **Dattier**.

**CAVALIERE**

282

Map 5

France

43 8' N. 6 25' E. At the mouth of Cavalière bay, near Le Lavandou; less than 500 m from the W. side of the bay. Depth: 43 m.

Bones (from meat) and amphoras. c. 100 BC.

The wreck, discovered by echo-sounder as a slight projection from the flat, sandy bottom, was excavated by R. Lequément and G. Charlin in 1974-7. A further season of excavation was planned, but has not taken place. Bones of domestic pig were found in 'considerable' quantity; the absence of feet, and the rarity of vertebrae, show that the meat was in the form of quarters, which could have been salted or smoked. About 25 amphoras were found, ten of form Lam. 2, eight Dr. 1C and seven Dr. 1A. These must mostly have contained wine, though one of each type of the Dr. 1 amphoras still held olives, presumably in defrutum. There were also some fragments of Coan amphoras, and of some very friable Punic amphoras which must have contained shipboard stores. The ship was, therefore, probably carrying as little as 3 tonnes of cargo; she was ballasted with 10 tonnes of stone - calcareous beach-rock, of widespread possible origin, and basalt from Sardinia or parts of southern France including the Antibes area.

A dozen pieces of black-gloss ware (in Camp. A, B and C fabrics, therefore from different sources) showed no sign of wear, and are thought by the excavators to have been baggage, not in use on board. The same is suggested for a group of pottery of Spanish origin, comprising jugs, a jar, and two goblets in grey ware, and six sombreros de copa (straight-sided, painted jars with a flat lip). It may be, of course, that these were ship's stores, recently acquired in southern Gaul or Italy from a chandler who had supplies from Spain. The coarse-ware (plates, casseroles, pitchers and jars), on the other hand, was blackened with use on board, as were two lamps. No metal utensils were found, suggesting a simple way of life aboard this ship. Various lead fishing-weights came from the stern, and a bronze key perhaps belonged to a chest on board.

Twelve coins were found, all bronze or lead; the three in the mast-step were illegible, but the other nine comprised five of Massilia, five of Numidia (rarely found outside N. Africa), and one of Carteia in southern Spain. There was at least one lead-stocked anchor, with a shank of evergreen oak. Other equipment included a sounding-lead, two bronze terminals (thought to have come from the steering-oars), a pulley wheel, and wooden rings from the pump. The hull was well-preserved. The structure was mostly of Bosnia pine, with tree-nails of fir and evergreen oak; species identification suggests the ship was built in Italy or Dalmatia. The ship was built shell-first in all observed parts, with a sharply-rising bow and low-slanting stern. The hull was patched, rather than sheathed continuously, with lead. The frames, notably knotted and grown to shape, were fastened mostly by treenails alone; they were relatively closely set (0.18 m apart). By contrast with the frames, the planking was very uniform, and the keel and garboards were carefully cut and finished. Near the stern was found what was apparently part of the superstructure, with a curved timber to which planks had been attached by means of a ligature. Careful graphic reconstruction of the hull shows that the ship was only 13 m overall, with a beam of 4.6 m, and her tonnage (depending on the formula used to calculate it) was only 19-21 tons. She would have drawn only 2.2 or 2.3 m laden, and so was probably intended to work small ports and coastal routes. Within the hold (which, to judge from a piece of what was probably a stanchion, may well have been decked) there was ample room for 400 amphoras (weighing some 20 tons) in two layers. Unless a good deal is still unaccounted for, she was therefore

less than three-quarters full when she sank.

The Cavalière ship had, not long before her loss in the last few years of the 2nd century BC, visited North Africa (Punic amphoras and Numidian coins), Campania (pottery and wine-amphoras from Apulia and Campania), and perhaps Liguria (renowned for pork); she had called at Antibes (ballast) and perhaps Marseilles (coins). However, there are strong links with Spain (pottery), also known for pork, or, indeed, all the cargo could have been taken on at Marseilles, even though the wine certainly originated in Italy. Being only a small vessel, she may indeed have been the private transport of a landowner or merchant; more likely, to judge from the simple equipment on board, she was a tramp, picking up speculative consignments as opportunity offered. At all events, even though the excavation and publication are incomplete, this shipwreck can well be regarded as a 'Roman Kyrenia'.

Charlin *et al.*, 1978; Gassend, 1980; Lequément, 1985: 113; Pomey, 1981a: 238; Aranegui, 1985: 108.

#### CAVALLO A

283

Map 6

France

41° 21' N. 9° 15' E. In the Strait of Bonifacio (Corsica); on the S. side of San Baiuso islet. Depth: 8-12 m.

Amphoras and glass vessels. c. AD 40-60.

The wreck lies in a 30 m long gully. The main cargo was of Dr. 2-4 amphoras of Tarraconensian type, of two fabrics; some were stamped on the foot (**P.TE**, **MALI** and **OPTATI**), and several have post-firing graffiti on the belly. Some of these stamps were also found together at **Ile-Rousse**, q.v. All were pitched inside, and stoppered with one or two cork discs; six complete examples still contained a red liquid which smelt like wine. (Laboratory analysis in the 1960s asserted that this was not wine, but tests using more modern techniques, as applied to amphoras from La **Madrague de Giens**, for example, would doubtless prove positive). A minor consignment was made up of blown glass bowls, clear, with a greenish rim; the five recorded by Bebko belong to either two or three nesting groups. The glass could no doubt have originated in Italy and been trans-shipped at an entrepôt; however, glass vessels of this kind were being made, not only in Italy, but probably in other western provinces, by the mid 1st century, and it is logical to suppose that such fragile objects would normally be conveyed from their province of manufacture, in this case, therefore, Spain.

Shipboard supplies included two different south Spanish amphoras, a mortarium, a large Italian terra sigillata plate, sherds of coarseware, and a terra sigillata inkwell. Equipment included a sounding-lead, the handle of a ladle or strainer together with the hook on which it hung, a five-pronged fishing-spear (for octopus?), and a stock of 50 iron and 50 copper nails. The sawn-off bottom of an amphora, thought by Bebko to have been a latrine, might rather have been used as a funnel. A bronze lamp (with ivy-leaf reflector and lion relief protomes) and a bronze figurine (with base) of Jupiter were also on board, belonging either to the ship or to a passenger. The ship was ballasted with pebbles, described as of black Alpine limestone veined with white. The ship's hull is partly preserved; the keel and some strakes survive, and also some frames, of which one retained the bark. Two 2 coins were found, both unidentified; they bear an emperor's head, and, on the reverse, a winged figure with spear and shield and the letters **S C**. This must date the wreck not earlier than Claudius, and a mid 1st century date seems likely anyway.

Bebko, 1971: 3 & figs 27-67; Parker & Price, 1981: 223-4; Corsi-Sciallano & Liou, 1985: 119-29; Liou, 1987b: 276.

Information: W. Bebko; D. Barag; H. Comfort.

**CAVALLO B** 284 Map 6 France

41° 22' N. 9° 15' E. At the foot of a reef, N. of Cavallo island. Depth: 8 m.

Amphoras. Late 3rd-4th century AD (?).

A scattered wreck of late Roman amphoras has been only summarily reported.

Bebko, 1971: 2.

**CAVALLO C** 285 Map 6 France

41° 22' N. 9° 16' E. North-west of Cala Zeri (or Zèzi), Cavallo island. Depth: 10 m.

Amphoras. c. 200-140 BC (?).

A wreck with a cargo of Graeco-Italic amphoras (Will type E) lay buried in sand. To judge from drawings (some published, some not) the amphoras show clear variation of rim and body-form; this characteristic of her type E was noted by E.L. Will in the **Capo Graziano A** cargo. From the site also came a black-gloss bowl with a central rosette stamp, perhaps datable towards 200 BC. No information about other finds has been made available.

Bebko, 1971: figs 316-7 & 328; Will, 1982: 354.

Information: W. Bebko.

**CAVEAUX A** 286 Map 5 France

43° 15' N. 5° 17' E. 'Caveaux 1', at the SE. point of Pomègues island. Depth: 20-25 m.

Amphoras. Late 2nd-early 1st century BC.

Inspection in 1982 of a site first reported by Benoit (1956: 28) revealed a poorly preserved wreck, with sherds of Dr. 1A amphoras and some wood fragments. A Camp. B cup from the site provides the date.

**CAVEAUX B** 287 Map 5 France

43° 15' N. 5° 17' E. 'Caveaux 2', buried in sand. Depth: 33-38 m.

Amphoras. c. 125-100 BC (?).

A wreck with a cargo of Italian amphoras has also produced a lamp and some Camp. A pottery; there was also some hand-made pottery from W. Provence in the cargo. The poorly-preserved hull was lightly built, probably a small vessel.

This might be the wreck of Dr. 1C amphoras, at 'Pomeggues', illustrated by Ciabatti (1983: 37).

Benoit, 1960: 41; DRASM, 1983: nos 275-6; Arcelin: 1986; Pomey at al., 1989: 14.

**ČAVLENA** 288 Map 8 Croatia

45° 6' N. 14° 27' E. On Krk island; detailed location and depth not reported.

Marble columns and other stone. Roman period (?).

A cargo of 'stones and elaborated columns', briefly reported, is presumably a Roman marble wreck.

Vrsalović, 1974: 53 & 240.

#### **Cavo (Italy)**

Finds from Cavo (Elba) include a bronze weight in the form of Roma, a dupondius of Antoninus Pius, and a bronze medallion of Marcus Aurelius. The site is considered a probable wreck by Zecchini, but without direct evidence.

Zecchini, 1982: 81 & 174-5.

**CAVOLI** 289 Map 6 Italy

39° 5' N. 9° 32' E. Between rocks on the S. side of Cavoli island, off Capo Carbonara (Sardinia). Depth: 10-13 m.

No cargo (?). c. AD 1425-1440.

A wreck with glazed pottery and tiles, found off Capo Carbonara in 1973 and briefly published by Fennell (1974), was rediscovered by an Italian geophysical survey team in 1986. In a hollow place ringed by rocks were 7 cannon, 16 breeches, balls of stone and iron, lead shot, a sword and fairly extensive remains of a ship's planking. Other finds included a lead token, a silver spoon, a bronze cauldron, a steelyard weight, scissors, and an iron anchor. The pottery (incorrectly dated from photos in 1974) comprises plates, jugs and barber's bowls in cobalt blue glazed ware, and tiles including many with the arms of the Becadelli Grimaldi family, apparently pre-dating a grant of heraldic privilege of 1450. The site is also said to be contaminated by amphoras from a nearby Roman wreck.

Fennell, 1974; Martín-Bueno, 1990; D'Agostino, 1991.

**CAVTAT** 290 Map 1 Croatia

42° 35' N. 18° 13' E. In the harbour of Cavtat. Depth: not reported.

Amphoras. c. 100-25 BC (?).

A confused report of amphoras found at or near Cavtat includes a group of Lam. 2 amphoras which could be from a wreck, as is indeed claimed (by Falcon-Barker). An earlier discovery from Cavtat (reported by Ucelli) was an oak timber with bronze nails, found together with Roman amphora sherds; this could be the same site.

Ucelli, 1950: 251; Falcon-Barker, 1960: 183 & 190-7.

**CECINA** 291 Map 7 Italy

43° 17' N. 10° 28' E. On the S. side of the mouth of the R. Cecina. Depth: 12-13 m.

Amphoras. c. 125-75 BC (?).

Investigation in 1979 revealed a cargo apparently entirely of Dr. 1C amphoras; also found were a mill-stone, and some treenails and bits of planking. The date is that proposed in the report.

Massa, M. in Martelli et al., 1982: 56-7.

(Other remains reported from the Cecina area do not appear to represent a shipwreck: see Massa, cit.).

**CEFALÙ** 292 Map 11 Italy

38° 1' N. 14° 2' E. Close to the rocky coast at La Calduna, on the E. side of Cefalù (Sicily). Depth: 3 m.

No cargo. 5th-6th centuries AD.

A large pile of stones (used as the base of an abortive harbour construction in the 18th century) turned out to contain the remains of a Byzantine ship. Pottery and amphoras found at the site (which could, of course, include some strays) suggest a date in the 5th century (6th-7th, according to Purpura). The amphoras, though numerous, appear to have been stores rather than cargo; they include globe and baluster shaped amphoras (Keay 53, 54, 55 & 62). There are graffiti in both Latin (e.g. **VINVM SILVANI**) and Greek. The pottery included t.s. chiara, not stamped, as well as coarseware and part of a glazed jug; both African and Aegean fabrics are present. The ballast stones are pink granite, micaceous rocks, and white marble.

Several iron anchors have been found at the site; also an axe. On the seaward side, bricks, iron and stone utensils and domestic pottery indicate the ship's galley. The timbers found in the pile of ballast stones were mainly, it seems, frames; they had been only roughly finished, indeed only partly debarked, and this had disguised the presence of the ship. The timbers are preserved over an area 35 x 6 m, which shows that the ship was certainly very large, and could possibly have been an oared galley. No full-scale excavation has yet taken place at this important site.

Purpura, 1983b; 1991: 139-43.

**CERVIA** 293 Map 8 Italy

44° 19' N. 12° 19' E. Near the Adriatic coast; buried in alluvium.

No cargo. Roman Imperial period (?).

The hull of a lagoon boat, 12-15 m long and 2-3 m in beam, was found in gravel digging in 1958. Various finds were made at the site, but it is not certain that these were securely associated with the boat; the material includes a sounding-lead, a copper pot, a roof-tile, some amphora fragments and two iron anchors. Pace Bonino (1968), the complete anchor is not of 2nd century date, but is more likely Byzantine; in fact, there is no certainty that it was associated with the boat. There was no keel; the planking was assembled by sewing, using holes drilled in the planks at an angle. This technique was traditional in the lower Po region in Roman and later times, as may be seen from **Valle Ponti** (a well-preserved Roman river-boat) and **Pomposa** (a medieval lagoon boat), both of which were sewn. The sewn boat of **Zaton**, on the other hand, with a keel, appears to be the only known example of coastal (if not open-sea) craft of Roman date assembled by sewing.

Bonino, 1971 (based on earlier results); 1968; Dolci et al., 1986: 14-15.

**CERVO** 294 Map 7 Italy

43° 55' N. 8° 7' E. Near Diano Marina, less than 1 mile from shore. Depth not reported.

Amphoras. c. 50 BC-AD 100 (?).

A cargo of at least 100 Dr. 2-4 amphoras was discovered by salvage divers. A published amphora-neck is of south Campanian type (comparable with groups 3, 4 & 8 of Panella & Fano, 1977).

Lamboglia, 1952c: 233.

**CHANTENAY** 295 Map 15 France

46° 45' N. 3° 0' E. (approx.). In the sand of the R. Allier, near Chantenay-Saint-Imbert (25 km NW. of Moulins).

Pottery. Roman period.

A 'Gaulish' boat laden with pottery, apparently Roman and presumably fine-ware, was found near Chantenay in the 19th century; no detailed information is available about the boat or the cargo.

Grégoire, 1895.

**CHAUDENEY-SUR-MOSELLE A & B**            **296-297**            Map 15            France

47° 49' N. 5° 30' E.

Two dugouts were dated to the Roman period by C<sub>14</sub> (ad 100±60 and ad 200±70).

McGrail, 1978: 111.

**CHERCHEL A**                            **298**                            Map 1                            Algeria

36° 36' N. 2° 11' E. One of two ships found in dredging the harbour of Cherchel (Caesarea Mauretaniae) in 1847. Depth: 3-4 m.

Lead ingots.                            c. 25 BC-AD 75 (?).

Several lead ingots were recovered from the remains of an ancient ship; the inscription on one was legible as **Q.VARI HIBERI**. Early reports state that both the ships found in the harbour contained ingots, but this may be a mistake. The hulls were well-preserved, but could not be saved.

Verneuil & Bugnot, 1870: 135; Corpus Inscriptionum Latinarum, VIII.2.10484.1; Leveau, 1984: 48.

**CHERCHEL B**                            **299**                            Map 1                            Algeria

36° 36' N. 2° 11' E. Found in the same way as wreck A.

Pottery.                                    Roman period.

Pottery was collected from the remains of a Roman ship.

Leveau, 1984: 48.

**CHIA**                                    **300**                            Map 6                            Italy

38° 54' N. 8° 54' E. (approx.). Near Chia (Sardinia); on a rock pinnacle. Depth: down to 44 m.

Amphoras.                                c. AD 200-275 (?).

A shipwreck with a cargo of Dr. 20 amphoras lay scattered down a rock-face and in notable quantity at the bottom. The only record of the amphoras is a photo of one without a rim, which, to judge from the form of the body and handles, belongs to the latest type of Dr. 20 amphora. The site had been thoroughly looted by 1968.

Unpublished.

Information: W. St J. Wilkes.



CHIESSI

301

Map 7

Italy

42° 45' N. 10° 6' E. Off Chiessi (Elba); 500 m from the land. Depth: 50 m.

Amphoras.

c. AD 60-85 (?).

Described as 'a cathedral of amphoras' when it was discovered, this large, well-preserved cargo of Spanish amphoras covered an area 25 x 12 m, and must have numbered 5,000-7,000 amphoras. The predominant form was Beltrán 2A; the others were Beltrán 2B, Dr. 20 and Haltern 70. The Dr. 20 amphoras included one stamped **SAENIANES**; the form 2A amphoras, sealed with terracotta stoppers, contained large quantities of vertebrae and other bones of fish, of which at least some were mackerel, *Scomber scombrus*. These amphoras form a useful, dated group. Also on board (perhaps only for shipboard use) were two Ibizan amphoras (Rossi, fig. 70b) and a Dr. 2-4 of Tarraconensian type. Bundles of brushwood were found wedged between some of the amphoras, and included *Erica scoparia*. An ingot, said to be of bronze, but perhaps in fact of copper, has also been reported; it weighed some 100 kg, but no other details are described. The wreck is dated by a stamped South Gaulish terra sigillata dish of the Nero-Vespasian period; other pottery found included two terra sigillata bowls, one marbled, the other possibly of Italian type (Zecchini (1971) fig. 39), and a lid and a cup in t.s. chiara A. Remains of the ship were found; they included copper nails, which had been driven through treenails (now mineralized). An unusual item was a lead tank, of which two sides survive, decorated in relief (cast ?) with a repeated bear-fight scene; the tank was pierced in at least two places for a circular outlet, and, indeed, a lead pipe with flanged ends which might have formed one such outlet was also found. Rossi suggests the last quarter of the 1st century or the first decade of the 2nd century as the date of the wreck; Liou proposes the 2nd or 3rd quarter of the 1st century; a Flavian date seems appropriate for all the reported finds. It is unfortunate that this interesting site is known only from hurriedly salvaged and confiscated material.

Zecchini, 1971: 84-9; Rossi, D. in Martelli *et al.*, 1982: 80-3; Zecchini, 1982: 128-33 (account by D. Rossi) & pls XXVII-XXXVI; Amar & Liou, 1984: 179, no. 205.

Chios: see sites listed under Khios.

CHRÉTIENNE A, LA

302

Map 5

France

43° 25' N. 6° 53' E. Near Agay/Anthéor; 80 m E. of La Chrétienne beacon. Depth: 21-25 m.

Amphoras.

c. 150-100 BC.

What was evidently a large ship came to rest, broken in two, partly in a gully between rocks; the cargo, which extended some 20 x 7 m when discovered in 1948, was eventually stripped by looters, but careful survey by F. Dumas and others has preserved a good deal of information. The cargo, numbering over 2,000 amphoras, in three layers, comprised mostly Dr. 1A amphoras, apparently of only a single identifiable variety; some were stamped at the base of the handle (**SS**, **ME** retrograde and **BZ**[ ] retrograde). The amphoras were closed with seals marked **M.C.LASSIVS** and **L.TITI.C.F.** There were also an unstated number of Lam. 2 amphoras, of a lip-form similar to that of the Dr. 1A amphoras. One may assume that the amphoras of both forms contained wine, though one Lam. 2 amphora held

pozzolana, presumably for sealing wine-amphoras in transit.

Forward of the mast-step were found an axe and an adze (preserved as voids in concretion); there were fragments of tiles in the same area, perhaps from the foredeck. The orientation of the ship was indicated by the discovery, not only of the mast-step, but also of a completely preserved anchor with lead stock; nearby were two lead-capped timbers, 0.3 m diameter at the top, square lower down, which must have been bitts, and a davit with a wooden roller. Other ship-board items included a black-gloss lamp, pottery and cooking utensils, a millstone, a bronze bracelet, a lead ingot and a piece of folded lead sheet. In the mast-step was a Punic coin of Cossura (Pantelleria), broadly datable to the 2nd century BC.

The ship's timbers were substantial; she had fine lines, according to Dumas' impressions on site. The frames (oak) showed a variety of arrangement: forward, all were floors, and had no limber-holes, amidships, there were limber-holes, and, towards the stern, frames and floors alternated as in other ships of the period. The ceiling (of 'white wood') was mostly preserved, and all over it was a dunnage layer of thin branches. No trace of lead sheathing was found on the hull.

Benoit, 1952b: 264; 1955; 1956: 30 & fig. 2. 17-18; 1962: fig. 52; Dumas, 1964; 1972: 156-72; Frost, 1963: Appendix; Tailliez, 1967: 157-9; Carre, 1983: 164; Hesnard & Gianfrotta, 1989: 398; Pomey et al., 1989: 42.

**CHRÉTIENNE B, LA** 303 Map 5 France

43 25' N. 6 53' E. To W. of La Chrétienne beacon. Depth: not reported.

Amphoras. Mid 1st-2nd century AD.

No information has been published about what must have been a well-preserved shipwreck. The cargo included at least two varieties of Beltrán 2B amphoras. No dating evidence is known.

Benoit, 1956: 30-2 & fig. 2. 19-20.

**CHRÉTIENNE C, LA** 304 Map 5 France

43 25' N. 6 53' E. Approx. 800 m W. of La Chrétienne reef. Depth: 35 m.

Amphoras. c. 175-150 BC.

A small ship, with a cargo of Graeco-Italic amphoras (Will type D), sank after striking the reef of La Chrétienne, before she could reach the nearby haven of Agay. Discovered in 1952, the partly-looted site was excavated (in 1970-3) and promptly published by J-P. Joncheray. The cargo can have been only some 500 amphoras, say 13-15 tonnes; the amphoras, none of which was stamped, were sealed with a cork disc and a mortar seal, marked (in all observable cases) **C.TEREN[TI] M.L.** The amphoras, stowed on a layer of brushwood, occupied the central part of the ship.

At one end of the ship was a 'working area', under a roof of tiles (of which only fragments remained); here were found three large jars, a mortarium and other coarse pottery, three sounding leads, and various other tools. Also at this end, presumably the bow (though this is questioned by Jézégou), were found three lead-stocked anchors, which would have been fastened horizontally,

pointing sternwards. There was also a 'living area' in the stern; here were found more coarse pottery, some fragments of single amphoras (Rhodian, Cnidian, Lam. 2 and Punic), and a collection of fishing-weights. No tiles were found in this area, so the after-cabin (if such it was) was unroofed. One lamp and a couple of unguent-flasks were the only items of non-utilitarian pottery. Fragments of black-gloss pottery, making up five vessels, were scattered throughout the wreck; various pieces of rigging (including a pulley-block and some small dead-eyes, part of a tackle rather than shrouds), a spike, and a denarius (perhaps datable to the last decade of the 3rd century BC) had fallen outside the remains of the hull. A few hazelnuts were found, at the bow, and some bone pins presumably represent personal items, like some of the other shipboard finds. As (for example) at **Cavalière**, there is a notable lack of kitchen utensils, or, indeed, of any kind of hearth or oven.

The ship herself was approx. 15 m long overall (12 m on the waterline), and 5 m in beam. The planking and frames were fastened without nails; the only nails used in the ship were of iron, and fastened the stringers and the keelson to the frames. The ceiling was poorly preserved, but was placed athwartships along the centre of the ship, fore-and-aft outboard of the stringers. The framing is rather widely-spaced for a Roman ship. The ship is thought to have been new when she sank. No mast-step survived, but it is thought that she would have been rigged with a single square sail. There are few clues to the origin of the ship, or her final route. A pot in 'Ampuritan' grey ware points to Catalonia, the stores amphoras to N. Africa and the Aegean. The black-gloss pottery is Italian, and so, too, is the cargo - probably from the Vesuvius area of Campania. Certainly the Chretienne C wreck represents a rather modest element of Italian wine exportation in the period between the Second and Third Punic Wars.

Joncheray, 1975a; Gassend, 1980: 75; Carre, 1983: 131; Jézégou, 1983: 112; Manacorda, 1986; Empereur & Hesnard, 1987: 27.

**CHRÉTIENNE D, LA**

**305**

Map 5

France

43° 25' N. 6 53' E. On the NE. side of La Chrétienne beacon; on a sandy bottom. Depth: 25 m.

Amphoras.

c. AD 325-375 (?).

Only a selection of material is known from this site, discovered in 1962 and now looted. The cargo amphoras comprise four of form Almagro 51C (with pointed foot), a Beltrán 72, a cylindrical amphora and an ovoid amphora (cf. Dr. 23). The cargo is comparable with Les **Catalans** and **Pampelonne**. Pottery, hull remains and two iron anchors were noted when the wreck was discovered. Its date can only be estimated.

Liou, 1973: 586; Lequément, 1976: figs 6 (b) & 9 (c-e); Pomey et al., 1989: 42-3.

**CHRÉTIENNE E, LA**

**306**

Map 5

France

43 25' N. 6 53' E. (?). Detailed location not reported. Depth: over 70 m.

Amphoras.

3rd-mid 2nd century BC.

A wreck with a cargo of Graeco-Italic amphoras was worked by helmet divers, at the behest of a local patron, in the 1920s, somewhere near Anthéor. The whereabouts are known of some of the amphoras, but no illustration has been published.

Joncheray, 1972c: 10.

**CHRÉTIENNE H, LA** 307 Map 5 France

43° 25' N. 6° 53' E. 1 km W. of La Chrétienne, on a clayey mud bottom; the name implies sites F and G, but nothing of these has been published. Depth: 58 m.

Amphoras. c. AD 15-20.

A wreck of Dr. 2-4 amphoras was discovered (from fishermen's reports) and excavated by C. Santamaria, 1974-80. The cargo, much disturbed by fishing-nets, made up a low mound, originally numbering 300 amphoras in a single layer. The amphoras all originate from Tarraconensis; most come from the lower Llobregat valley, a much smaller proportion from Badalona and other sites in the Maresme of Catalonia. This detailed attribution is due to the large number of stamps: almost two-thirds of the amphoras raised were stamped, usually on the foot, with some 60 legible stamps (mostly of two, three or four letters), often in pairs or threes, eg. **SAB + QVA, ACA + CLAR, FIR + THA, HIL**. This cargo lay over a layer of ballast (composed of sand, gravel and stones) which most likely came from the mouth of the R. Fluvia, near Ampurias; the ship may, therefore, have sailed SW. along the coast of Catalonia to another port (or ports) in order to pick up her cargo of wine amphoras.

There were two iron anchors on board, of which one was lying on deck, its stock disconnected at its side. The ship's equipment included two axes and a roll of lead. Three Dr. 9-10 amphoras (probably from NE. Spain), a Baetican Dr. 7 containing fish-bones, a Dr. 20 amphora, a Punic amphora and an amphora of Rhodian type were stores. There were also four coarseware jugs, two fine-wall vessels, and at least three glass vessels; the lack of plates and dishes is surprising. Several weapons were found - a short sword sheath, a cutlass and a dagger.

The ship's hull, well-preserved, could not be cleared because of the depth, the sticky mud bottom, and the weight of ballast to be moved. Remains of a pump and lead piping were found towards one end of the wreck, doubtless the stern; the shipboard material and the anchors were also found there. The ship was quite small, approx. 15 x 5 m. About twelve amphoras identical to those in the wreck have been found at 'gisement A', 850 m E. of the site; these could well have been jettisoned from the damaged Chrétienne H ship before she finally sank. Amphora-stamps identical to some of those from Chrétienne H were found also at **Perduto** and **Sud-Lavezzi C**, which are therefore contemporary.

Santamaria, 1984a; Corsi-Sciallano & Liou, 1985: 78-94; Liou, 1987b: 275-6.

**CHRÉTIENNE I, LA** 308 Map 5 France

43° 25' N. 6° 53' E. NE. of the Chretienne beacon. Depth: 53 m.

Amphoras and resin. 1st century AD (?).

The main feature of the site (discovered first in 1974) was a tumulus, 5 x 8 m, of resin; some oval blocks of resin had become detached. There had also been a consignment of Dr. 9-10 amphoras, now mostly looted. Other finds were Dr. 28 and cf. Dr. 26 amphoras and a piece of lead pipe.

Pomey et al., 1989: 43-4.

**CHRÉTIENNE J, LA** 309 Map 5 France

43° 25' N. 6° 53' E. NE. of the Chretienne beacon, 200 m N. of wreck I. Depth: 55-60 m (?).

Metal goods. Late 2nd-early 1st century BC.

A mound of concretion, 80 cm tall, measured 13 x 5 m as discovered by J-P. Joncheray in 1984. The concretion contained tools: two adzes have been extracted and reconstituted by moulding. The concretion also contained two catilli and one meta from mills and some pottery and amphoras including a Dr. 1C.

Pomey et al., 1989: 44.

**CIACCIA, LA** 310 Map 6 Italy

40° 55' N. 8° 46' E. (approx.). Near Valledoria (N. Sardinia); detailed location and depth not reported.

Amphoras. 3rd-mid 1st century BC (?).

On a bottom littered with broken amphoras was found a small lead anchor-stock; near the beach was a mill-stone. The date and form of the amphoras are not reported; the anchor-stock is presumably of the Republican period. This probably is a scattered wreck.

Boninu, 1986: 59.

**ČIKAT** 311 Map 8 Croatia

44° 31' N. 14° 27' E. In Čikat bay, on the W. side of Lošinj; detailed location and depth not reported.

Amphoras. 1st century BC-AD.

A wreck of Lam. 2 or Dr. 6 amphoras has been summarily reported.

Brusić, 1980: 159.

**CIOTAT A, LA** 312 Map 5 France

43° 9' N. 5° 36' E. The wreck of 'Le Canonnier du Sud', a buoy between Île Verte and Le Bec de l'Aigle, La Ciotat. Depth: 18-24 m.

Amphoras. c. 200-140 BC (?).

An originally well-preserved wreck had a cargo of Graeco-Italic amphoras (Will type E). The amphoras were all stamped, at the base of the handle, **BAL, DEC, [ ]AR** and **SAL**. They had a mortar seal, marked **AIL..R[ ]**. Other finds included black-gloss pottery (said to be of Camp. A type), a painted sombrero de copa, a small jar of 'Ampuritan' grey ware, and a jug. Perhaps the amphoras, too, came from Spain. Also found was a terracotta bath, and a lead cinerary urn. A few pieces of ship's equipment reported comprise a pulley-wheel, a lead pipe, a wooden bitt (now lost) and an iron anchor. The wreck was stripped by looters soon after its discovery in 1956; it is much to be regretted that more information could not be salvaged from the site.

Benoit, 1958: 24-6; 1960: 44; 1962: 168-9; Carre, 1983: 169.

**CIOTAT B, LA** 313 Map 5 France

43° 9' N. 5° 37' E. At the SE. point of Île Verte. Depth: 30 m.

Amphoras. 4th century BC (?).

A wreck of Massiliot amphoras has been summarily reported.

Benoit, 1960: 43.

**CIOTAT C, LA** 314 Map 5 France

43° 9' N. 5° 37' E. (approx.). Off La Ciotat; location not published. Depth: 50-60 m.

Amphoras. Late 2nd-early 1st century BC.

A cargo of Dr. 1A amphoras was discovered in 1985.

Pomey et al., 1989.

**CIOTAT D, LA** 315 Map 5 France

43° 5' N. 5° 37' E. (approx.). 4 miles off La Ciotat. Depth: 'considerable'.

Cargo unknown. c. AD 275.

A bag-shaped hoard of 3,941 coins, brought up in a net in 1935, is only a supposed wreck. The coins are of Saloninus-Quintillus (including Tetrici), dating from the 260s and early 270s AD.

Benoit, 1965b.

## **Ciotat, La**

A further site at La Ciotat, thought to be a wreck by Benoit, is described by Carrazé as a mere 'gisement' (site); Punic and ovoid amphoras reported from this site are thus not definitely associated.

Benoit, 1960: 43 & 46; 1965a: 84 & pl. 42. 3; Carrazé, 1970f: 42.

**CIOVO** **316** Map 8 Croatia

43° 30' N. 16° 17' E. Off Ciovo island; detailed location and depth not reported.

Pottery. 1st century BC-2nd century AD (?).

Nothing has been published of a wreck with leaf-pattern imitation terra sigillata pottery.

Information: N. Cambi (Lipari, 1976).

**CIRCEO A** **317** Map 9 Italy

41° 12' N. 13° 7' E. (approx.). On the S. side of the headland of Circeo; depth not reported.

Amphoras, pottery and lamps. Mid-late 6th century BC.

The wreck of a merchant ship, probably Greek, with a cargo of lamps, Ionian B2 cups and Corinthian B amphoras, has been briefly reported.

Gianfrotta, 1989a: 44.

**CIRCEO B** **318** Map 9 Italy

41° 12' N. 13° 5' E. (approx.). Off Circeo: detailed location and depth unknown.

Amphoras. c. 250-150 BC (?).

Graeco-Italic amphoras have been found off Circeo in at least one wreck.

Gianfrotta, 1989a: 44.

**CIRCEO C** **319** Map 9 Italy

41° 12' N. 13° 5' E. (approx.). Close to the headland of Circeo, on the S. side; off Torre Olevola (not found) according to Righi. Depth not reported.

Amphoras. c. 150-1 BC.

Dr. 1 amphoras have been found in at least one wreck off Circeo.

Righi, 1983: 209, no. 30; Gianfrotta, 1989a: 44.

**CIRCEO D** **320** Map 9 Italy

41° 13' N. 13° 7' E. (?). Off Golfo Sereno (not found) on Circeo. Depth: 15 m.

Dolia and amphoras. Late 1st century BC-early 1st century AD.

Dr. 2-4 amphoras and at least three dolia were aboard a wreck of the Augustan period, partly buried in sand. T.s. italica (one stamped) provides an Augustan date.

Gianfrotta, 1989a: 46.

**CIRCEO E** **321** Map 9 Italy

41° 14' N. 13° 2' E. Close to the N. side of Circeo. Depth not reported.

Amphoras. 3rd-early 4th century AD.

A much looted wreck had a cargo of Afr. 2B or 2D amphoras, one bearing a small circular stamp.

Gianfrotta, 1989a: 50.

#### **Circeo: other finds**

Two Spanish amphoras (Haltern 70 and Cam. 186) illustrated by Gianfrotta (1989a: 46-50) might come from a wreck, though this is not stated.

**CIRELLA DI DIAMANTE** **322** Map 9 Italy

39° 42' N. 15° 48' E. (approx.). Off Cirella di Diamante (Cosenza); exact location and depth not reported.

Amphoras and pottery. 1st century BC (?).

What appears to be a wreck, said to be of the 1st century BC, with Roman amphoras and a good deal of pottery and other finds, has been summarily reported.

Gandolfi, 1985b.

#### **Ciudadela (Spain)**



Wrecks or other sites, some with Roman amphoras, have been only summarily reported from the area of Ciudadela (Minorca).

Fasti Archaeologici, 28-9: no. 10922; Fernández-Miranda et al., 1977: 18.

**CIVITAVECCHIA**

**323**

Map 7

Italy

42° 5' N. 11° 46' E. At the entrance of Civitavecchia harbour. Depth: not reported.

Amphoras. c. AD 50-150 (?).

Some pear-shaped amphoras have been reported from a wreck at Civitavecchia. Parts of the ship's keel and planking survive.

Gianfrotta, 1982: 24.

**Civitavecchia: other sites**

A late Republican deposit (Gianfrotta, 1982: 24), a cargo of local stone blocks (Gianfrotta & Pomey, 1981: 222) and a site which produced a dolium stamped **CASSIVS | CAHI C S F** (Gianfrotta & Hesnard, 1987: 289) are among other sites which might be shipwrecks in the area of Civitavecchia. See also **Torre Valdaliga**.

Cnidus: see **Knidos**.

'Cobre': see **Sancti Petri**.

**ÇÜKERTME A**

**324**

Map 13

Turkey

37 0' N. 27 47' E. At ÇÜkertme. Depth: shallow.

Amphoras. 7th-5th centuries BC.

A wreck of 'basket jar' amphoras has been briefly reported, scattered on a reef.

Rosloff, 1981: 279-80 (with the Longitude incorrectly printed).

**ÇÜKERTME B**

**325**

Map 13

Turkey

37 0' N. 27 47' E. On the same reef as wreck A.

Amphoras. 1st century BC.

A wreck of Cnidian amphoras, stamped (but with stamps too eroded to read) has been briefly investigated and reported.

Rosloff, 1981: 279-80.

Coll de Gorg: see **Punta Palom**.

**COLONIA DE SANT JORDI A**

**326**

Map 3

Spain

39° 18' N. 3° 0' E. East of Colonia de Sant Jordi, or Ses Salines (Majorca); on the inshore side of a reef, 55 m from land. Depth: 4 m.

Amphoras, almonds, olives and pork.

c. 100 BC.

One of several wrecks in the bay of Colonia de Sant Jordi, long known and rather depredated, was exposed by a storm early in 1977 and excavated as a precaution against further looting in the summer of that year under the general direction of D. Cerda, who subsequently published a report (1980); further information (and criticism) was later published by D. Colls (1987). Bones of domestic pig, almonds and olive-pits were abundant at the site; the olives were of two sizes, the smaller type being contained in small jars with high handles, probably covered with a (now perished) top tied on with string. These olive-jars are perhaps of Campanian origin (according to Colls), rather than from mainland Spain or the Balearic Islands (as thought by Cerda). The amphora cargo was made up of Dr. 1A, Dr. 1C and Lam. 2 amphoras, with a number of varieties; the Lam. 2 amphoras were stamped **SIRAZ, DACVS, APOLO, VERSO, PLV[ ]** (retrograde) and **SA[ ]**, and one Dr. 1C amphora was stamped, too. All the amphoras were lined, but no trace of contents was found. The Dr. 1C amphoras were in the majority.

The wreck produced a striking range of shipboard pottery and other finds. The stores included an unglazed lagynos and various more or less fragmentary amphoras and jars, among which were a Punic, a Coan and a Cnidian amphora. Kitchen ware included several jars, covered with soot and still containing some charred remains of food, jars and dishes in grey ware, a cooking dish, a frying pan and two mortaria. There were some pieces of a dolium (?), and two lamps, one with a Punic stamp (ltnt). A stone hand-mill had been removed by looters. Over two dozen pieces of black-gloss ware (Camp. B), several fine-wall goblets (some of Italian make) and Italo-Megarian cups, and almost a dozen plates or lids (including one in Pompeian Red ware), several incised **HE** before firing, suggest that the ship catered for a fair number of persons. Drinks, too, could be dispensed from at least 15 jugs and pitchers of various kinds. As at the otherwise comparable site of **Cavalière**, no metal utensils were found. Two iron knives, an iron axe, the bone handle of a stylus and a whetstone were all the surviving tools and equipment, apart from two stone weights with iron handles, weighing roughly 50 and 100 Roman pounds each. There is no evidence that any part of the ship was roofed, since only two fragments of tiles were found; a wooden bobbin (as found at **Kyrenia** and **Porticello**) may have been part of the rigging, and in this case retains the marks of axles at each side, showing that it had been mounted as a pulley. The excavated site measured some 13 x 4 m; only a minor part of the ship's planking was preserved. The keel and mast-step, visible in the early 1960s, had not survived; the remaining timbers were studied in situ and some samples were raised for study. Stones, not of local origin, represented ballast.

The hull construction was studied in detail by Colls. The planking (pine) was fastened to frames of oak (Quercus sessiliflora ex-robur) by treenails of pine or fir, transfixed by copper nails (except in the case of one frame, thought to be a replacement, which was fastened with iron nails). There was no fixed ceiling; traces of stringers survived, showing that the hold had been ceiled with loose planks. The interior of the planking was smeared with a coat of pitch, and externally there was a covering of fibrous material, coated in resin or wax, beneath a carefully made lead sheathing. The method of the planking assembly is unparalleled: the planking tenons (of evergreen oak) were fastened with two elm treenails in one plank and one treenail in the other. Although the orientation of the planking is not certain (since neither keel nor bulwark survives), it seems likely (as Colls suggests) that the single-treenail joints were in the lower of each edge-joined pair of planks; the planking was therefore partly pre-assembled before being set in place. Details show that (in the observed instances) the frames were already erected when the planking treenails were driven into each of the lower planks; Colls classes this as 'skeleton' construction, but, since we cannot tell exactly where the preserved planking lay in the ship, a sequence of construction using 'active' frames at some stage seems more in line with other ships of the period. In any case, the timbers (futtocks ?) scarfed to the upper end of two of the frames are not joined to them, and cannot have stood up without the support of either the planking or a substantial cradle. Whatever may be the detailed interpretation of these fragmentary remains, there can be no doubt that the Colonia de Sant Jordi ship was built to an extraordinarily high standard of carpentry, using a laborious technique which it is not surprising has not been found in other wrecks.

The date of the wreck must be similar to that of **Cavalière**, around 100 BC or a few years later. Again as at Cavalière, the Colonia de Sant Jordi ship, perhaps a private transport, perhaps a tramp, carried stores and equipment indicating contacts with N. Africa, the Aegean and mainland Spain; in this case, however, not only the cargo amphoras but also a notable proportion of the ship-board pottery came from Italy (perhaps Campania).

Mascaro, 1962; 1971; Cerdá, 1980; Colls, 1987.

Colonia de Sant Jordi B = **Ses Salines**, qv.

**COLONIA DE SANT JORDI C**                      327                      Map 3                      Spain

39° 18' N. 3° 0' E. Approx. 400 m NE. of wreck A. Depth: shallow.

Amphoras and pottery (?).                      c. AD 250-300 (?).

Little is known about a much-looted site close to the shore of Colonia de Sant Jordi bay. All that has survived the plundering are some Afr. 2B-D amphora necks and pieces of large plates with blackened rim ('ad orlo annerito'). The date (mid 3rd century, according to Blanquez) is uncertain.

Cerdá, 1979b: figs 106-9; 1980: 12-13; Blánquez, 1982: 28.

**COLONIA DE SANT JORDI D**                      328                      Map 3                      Spain

39° 18' N. 3° 0' E. At the water's edge, 100 m N. of wreck C.

A hull is sometimes revealed by storms; nothing is known of its date, or of any cargo.

Cerdá, 1980: 12-13. According to Colls (1987: 9), this site is a discontinuous part of wreck C.

Colonia de Sant Jordi E = **Na Guardis**, qv.

### **Colonia de Sant Jordi: other sites**

There are at least three other wrecks in the vicinity, but these are described as 'completely looted' and no further information is given by Cerdá (1979b).

### **COLTELLAZZO A**

329

Map 6

Italy

38° 58' N. 9° 2' E. To the S. and E. of Coltellazzo reef, the extension of the headland of Nora; scattered in sandy pockets among rock and weed over an area of 125 x 75 m or more. Depth: 16-19 m.

Amphoras.

7th-6th centuries BC.

Punic amphoras and other material which lay scattered over several hundred square metres of seabed have been surveyed, and some items raised, in the years following 1978, by M. Cassien in collaboration with F. Barreca. The Punic amphoras fall chronologically into two groups, of which the earlier can be dated mostly to the 6th century BC. These archaic amphoras are mostly of Bartoloni forms B, C and D; they contain animal bones, which have been studied in detail by F. Poplin (in Cassien, 1981 & 1984); most of the bones are cuts of lamb, though in some cases they are of older sheep or cattle (in one case, of zebu, or humped cattle). The presence of charcoal fragments and grape pips strongly suggests that the meat was dried and packed in grape-lees. Similar bones (of sheep and cattle) were also found in some of the later amphoras referred to below. At least one archaic amphora was repaired (and thus reused) in antiquity.

There have also been found dozens of coarseware jugs, jars, cups, cooking-pots, lamps and incense-burners, mostly complete, of 7th or 6th century date.

At many points the archaic material lies alongside amphoras and terracotta sculptures of the 3rd-2nd centuries BC. There is no certainty that two wrecks are involved, especially as no stratigraphic superimposition has been observed, and the detailed planning of the site shows no division of distribution. However, the archaic material is certainly denser in the area P5 which was intensively salvaged, and the later material is more widely spread towards the NE. of the survey area. The very depth of the site, the state of preservation of the amphoras, and the presence of some nautical items of the appropriate period (see wreck B, below), rule out submergence of a land deposit. It remains possible that the material was deposited across the site by ships at anchor, or in some ritual; however, the clear division of the Punic pottery and amphoras into two phases makes this unlikely. The conclusion which must be adopted, at least as a working hypothesis, is that two ships were in fact wrecked off Coltellazzo, 400 years apart, each of which chanced to be carrying preserved

meat in amphoras, and which scattered their contents very widely after they came to grief on the rocks.

Animal bones were also found in a Punic amphora (isolated) at Torre la Sal (q.v.).

Cassien, 1981; 1984; Archéologia, 201 (April 1985): 16; Barreca, 1986.

**COLTELLAZZO B** 330 Map 6 Italy

38° 58' N. 9° 2' E. Close to wreck A.

Cargo including statues. 4th-2nd centuries BC.

The survey off Coltellazzo by M. Cassien was given impetus by the discovery in 1979 of a larger-than-life size female terracotta head, 'the Lady of Nora'; other human heads (two male and two female) and pieces of other terracotta figures, including animals' ears, have been found in the same area, S. and E. of the headland. The heads had not been broken off, but were pieces of composite figures. The style of the terracottas indicates a date not earlier than the 4th, more likely the end of the 3rd or the early 2nd century BC. A 'beautiful, unmarked, life-size terracotta head of about first century BC' was found by W. St J. Wilkes in a weed bank off Nora in 1967, and this may have been at the same site.

These sculptures must be associated with the cigar- and torpedo-shaped amphoras of forms Bartoloni H and I, datable to the 3rd century BC, which were widely found in the survey area. At one point two of these amphoras overlay a pair of lead anchor-stock filling pieces (as found at **Porticello** and **Secca di Capistello**) and an iron concretion containing wood.

Cassien, 1981; 1984; Archéologia, 201 (April 1985): 16; Barreca, 1986; cf. Wilkes, 1971: 138.

**COLTELLAZZO C** 331 Map 6 Italy

38° 58' N. 9° 2' E. Close to the S. side of Coltellazzo headland. Depth: 3-7 m.

Amphoras. c. 100-75 BC (?).

A badly broken-up wreck of late Republican wine amphoras is said to lie on the flank of Coltellazzo, but no details of the amphoras (presumably Dr. 1 or Lam. 2) have been published.

Cassien, 1981: 50; Barreca, 1986.

**COLUMBRETES** 332 Map 1 Spain

39° 50' N. 0° 40' E. At the Columbretes islands, off the Tarragona coast; on the E. side of the largest island. Depth: 30-35 m.

Amphoras. c. 25 BC-AD 75 (?).

A widely-spread cargo of Dr. 7-11 amphoras lay at the foot of a cliff; several amphoras, of different types, have been published, but no other material or details of the site. The amphoras are probably Baetican, as Pascual asserts, though one at least might be of Tarraconensian origin (cf. Liou, 1975: 577).

Oliva & Domenech, 1971; Pascual, 1975.

Comacchio: see **Valle Ponti**.

**COMINO** 333 Map 12 Malta

36° 0' N. 14° 20' E. On the S. side of Comino island. Depth: 37 m.

Amphoras. c. 350-200 BC (?).

A probable wreck of Punic amphoras has not been reported in detail.

Unpublished.

Congloué: see **Grand Congloué**.

**CONILLERA** 334 Map 3 Spain

38° 58' N. 1° 12' E. At Conillera or Cunillera (Castilian: Conejera) island, W. of Ibiza; by a reef at the S. point of the island. Depth: 30 m.

Amphoras. c. AD 30-190 (?).

A well-preserved shipwreck with an apparently large cargo of Beltran 4B amphoras was mostly destroyed by looters; salvage excavations by B. Vilar-Sancho have been only briefly reported. The amphoras remained in position; they were stacked in at least three layers and in at least six files. The extent of the site was over 25 x 10 m; there were probably at least 1,200 amphoras present. They had terracotta stoppers, and contained remains of fish (unidentified). Some other pottery was found at the site; so, too, were extensive remains of the ship, of which little information has been reported. A lead anchor-stock was also found. The destruction of this shipwreck, one of only two known with amphoras of this form, is lamentable.

Vilar-Sancho & Mañá, 1964; 1965; Beltrán, 1977: 289; Parker, 1977. Falcon-Barker (1964) refers to this site, but gives no worthwhile information.

**CONTARINA** 335 Map 8 Italy

45° 2' N. 12° 13' E. Near Rovigo. Silted.

No cargo. Early 13th century AD.

A medieval ship, 21 m long, built of oak, with stringers of larch, was found in 1898.

Bonino, 1978: 12-15.

**CORBELLA** 336 Map 7 Italy

42° 43' N. 10° 21' E. At Corbella islet, southern Elba. Depth: 45 m.

Cargo unknown. Roman period.

A Roman wreck of unknown nature, with a lead anchor-stock, lies buried in mud.

Zecchini, 1971: 185. (No reference in Martelli et al., 1982).

**CORFU** 337 Map 1 Greece

39° N. 19° E. (approx.). Somewhere off Corfù (Kerkira). Depth: deep.

Amphoras. 2nd century BC (?).

A wreck with a cargo of amphoras, said to be 2nd century BC, was destroyed by sports divers as a 'graduation exercise'.

Throckmorton, 1970a: 225.

**CORSICA** 338 Map 6 France

41° N. 9° E. (approx.). At an unknown site off Corsica, probably the S. part.

Cargo unknown. c. AD 274.

A gold hoard is thought to come from a shipwreck in S. Corsica; one version states that it was found by a 19th-century coral fisherman. There are 72 aurei and 13 multiple-aurei coins, minted at Rome, Siscia and Milan; the hoard was lost between late in 270 and early in 274. As well as coins, there appear to have been two thick rings of gold, each weighing 20 grammes and probably meant for  $\frac{1}{4}$  ounce.

Lafaurie, 1958; 1959; Huvelin & Lafaurie, 1980.

**CORTE CAVANELLA** 339 Map 8 Italy

45° 21' N. 12° 16' E. (approx.). In Loreo comune (prov. Rovigo); 200 m from the modern course of R. Adige. Silted.

No cargo. 1st-3rd centuries AD.

During excavation of a Roman settlement of the Imperial period, not far from the mouth of the R. Adige, a dock was discovered. It had timbered sides and a tiled roof; the roof collapsed, doubtless at a time of flood, and trapped a planked boat in the dock. The boat, flat-bottomed, measured at least 7.45 x 1.90 m; it has not been raised. The site may be a mansio (posting-station) on the official route from Rimini to Altino, so perhaps this boat is something to do with the posting service.

Sanesi, 1986.

**CORTEGADA**

**340**

Map 15

Spain

42° 30' N. 8° 53' W. (approx.). Close to Isla Cortegada, in Ría de Arosa (Pontevedra). Depth not reported.

Amphoras.

1st century AD (?).

The remains of at least 23 amphoras (some complete) have been recovered from a scattered site. Other finds include two terra sigillata plates (one stamped), native pottery and tegulae. The amphoras are said to be 1st century, but none of the finds is illustrated in the brief published report. Detailed survey of the site suggests that the material probably does derive from a wreck, though no trace of a ship has been found.

Patiño, 1984: 29.

**Courreaux-de-Groix (France)**

A Dr. 1A amphora found by fishermen in 1868 off Courreaux-de-Groix (Brittany) might be from a wreck, but there is no supporting evidence.

André, 1959.

**COVA DEL INFERN**

**341**

Map 4

Spain

42° 19' N. 3° 19' E. (approx.). A wreck at the E. point of Cap de Creus (Catalonia); location and depth not reported.

Dolia.

1st century BC-mid 2nd century AD (?).

Several dolia, variously reported as from Cadaqués, Freu de la Clavaguera or l'Encalladora, are now known to come from a wreck at Cova del Infern: this is a different site from the Dr. 1 wreck of La **Masa d'Or**. No details of the site have been published.

Oliva, 1961: 237-41; Nieto, 1986: 82.

Cres: see **Pernat**.



Crotone: see **Punta Scifo**.

**CUDREFIN** 342 Map 15 Switzerland

46° 57' N. 7° 1' E. Dugout 'Cudrefin VD 1871', found in L. Neuchâtel in 1871.

No cargo. c. 50 BC-AD 150.

A pinewood dugout, 11.3 m long, has been dated by C<sub>14</sub> to the end of the Iron Age or the early Roman period. In form, with reserved cross-pieces, the boat resembles dugouts known to be of Bronze Age date.

Arnold *et al.*, 1988.

**CUEVA DEL JARRO A & B** 343-344 Map 2 Spain

36° 43' N. 3° 43' W. At Punta de la Mona, W. of Almuñecar (Granada); scattered on a cliff. Depth: down to 30 m.

A. Amphoras. c. 350-250 BC (?).

B. Amphoras. c. AD 50-100 (?).

A large deposit of amphoras on a cliff and in sand at its foot appears to represent two wrecks. The earlier is of Punic amphoras, comprising two varieties of Mañá type A. The later is of Dr. 20 and Beltran 2B amphoras. No definite dating evidence has been reported. From the same site, or thereabouts, came a bronze Roman officer's cuirass, but this cannot be definitely linked with the Roman amphoras.

Pascual, 1973: 113-8.

**CULIP A** 345 Map 4 Spain

42° 19' N. 3° 17' E. 'Culip I', also known as L'Encalladora; on a rocky slope in Cala Culip (on Cap de Creus, adjoining the dangerous channel of Freu de l'Encalladora). Depth: 9-12 m.

Amphoras. c. 50 BC-AD 25 (?).

A cargo of Pascual 1 amphoras, now much disturbed by looters, has long been known to lie in Cala Culip. The recent survey by F.J. Nieto showed that the site has been contaminated by later pottery, fallen from wreck D (Culip IV), which lies 50 m away at a higher level.

Ametlla, 1957: 118, 123 & 165; Oliva, 1961: 232-47; Pascual, 1962a: 341; Nieto, 1986: 81-2; Liou, 1987b: 272.

Information: R. Pascual.

## Culip II

A second site in Cala Culip is too scattered and looted to represent a datable wreck.

Nieto, 1986: 82; 1989: 17.

**CULIP C** **346** Map 4 Spain

42° 19' N. 3° 17' E. 'Culip III'; in Cala Culip (on Cap de Creus). Depth: 18 m.

Amphoras. c. 50 BC-AD 25 (?).

A wreck of Pascual 1 amphoras, now very much destroyed, lies in Cala Culip; the ship's hull may survive.

Nieto, 1986: 81-2; Liou, 1987b: 272.

**CULIP D** **347** Map 4 Spain

42° 19' N. 3° 17' E. 'Culip IV'; close to rocks in Cala Culip, on Cap de Creus. Depth: 7 m.

Pottery, amphoras and lamps. c. AD 70-80.

This wreck, discovered by F.J. Nieto in 1984, was mostly concealed by 80-100 cm of sea-grass roots. Excavation subsequently recovered over 100,000 objects. The main cargo consisted of at least 76 Dr. 20 amphoras, 22 of them stamped **BARN**, **CALPC**, **C.MARI**, **LSTRL**, **QSP**, **ROMANI**, **T.ATILIASIATICI** or one of three variants of **VRITI**.... Some of the amphoras were stopped with poor-quality, loosely fitting stoppers, from which it appears likely they had been opened and re-sealed, if not emptied and refilled, before the final voyage, although they were all fairly new. There was also a consignment of some 1,500 cups and beakers in fine-wall ware, of Baetican origin, and a smaller lot of at least 42 lamps, mostly marked **OPPI**, made at Rome. There was also a consignment of South Gaulish terra sigillata from La Graufesenque, datable to the reign of Vespasian (69-79), comprising nearly 2,000 plain and over 750 decorated vessels, marked with 54 different stamps bearing over 30 different names. Bowls of forms Drag. 37 and Drag. 29 were stacked in nesting piles. In terms of both weight and stowage space, the pottery and lamps counted for little compared with the amphoras; the total weight of cargo recovered is some 8.25 metric tonnes, which corresponds well with the size of the ship, estimated from traces on site at 9 - 10 m x 3 m, with a gross tonnage of about 8 tons, while the amphoras, if they were loaded in two layers, correspond to the calculated volume of the hold.

Shipboard items include a variety of amphoras, cooking pottery, two mortaria (one stamped **FORTVNA | DOMITIO**), five tiles (probably from a cooking-hearth), two lamps and a glass unguentarium. Personal possessions comprised three bronze rings, a pottery bead or spindle-whorl, two small stone tablets (one of marble from Scyros), and 24 counters (23 of glass and one, no doubt a replacement, of stone). Two peach stones, an olive-pit, and a handful of teeth and bones of pig, cattle and sheep/goat no doubt represent food eaten on board. There were lead fishing weights of various types, a lead ring and a nail-lifter or drove; from what may have been the forepart of the ship came a goat's horn, perhaps mounted there as a talisman, and another find was a Triton shell of a

species found mostly in the eastern Mediterranean, thought to have been used as a signal-horn.

Only small fragments of the ship's hull survived; she appears to have capsized after striking the rocky coast. Frames and planking were of Pinus sylvestris L. or P. nigra Arn., and most of the treenails of olive. Some nails of copper, many of iron were found on the site - could the latter have come from a deck rather than the main hull? Wooden discs, an iron bolt and lead pipework fragments represent the ship's pump. The hull was probably patched, rather than sheathed all over, with lead. The excavator considers that this small ship, obviously of limited function, was undecked. The cargo, deriving from Baetica, Latium and Gallia Narbonensis, must have been assembled and loaded at Narbonne by a negotiator cretarius. The meticulous excavation and analysis of the finds (not yet complete) has yielded important information about terra sigillata production and the organisation of trade in the early Flavian period.

Nieto, 1985; 1986; 1988; 1989: 1-257.

Information: F.J. Nieto.

**CULIP E** 348 Map 4 Spain

42° 19' N. 3° 17' E. 'Culip V'; detailed location and depth not reported.

Amphoras. c. AD 50-100 (?).

A wreck, now much looted, in Cala Culip contains amphoras of Beltrán 2A form. There may have been other Spanish amphora types in the cargo.

Oliva, 1961; Pascual, 1963, fig. 8; Nieto, 1986: 81-2; 1989: 17.

**CULIP F** 349 Map 4 Spain

42° 19' N. 3° 17' E. 'Culip VI'; 15 m away from wreck D. Depth: 5 m.

Pottery, meat and fruit. c. AD 1350-1400 (?).

A cap of sea-grass overlay the remains of a medieval ship. The cargo was very fragmented, especially by abrasion from the ship's ballast stones; it appears to have comprised pottery from the Kingdom of Granada and some typical of Languedoc, datable probably to the 14th century AD, as well as butchered meat of sheep/goat, cattle, horse, pig and fowl and almonds, hazels, walnuts, peaches and pine-cones. The ship was skeleton-built, with a shallow keel, on close-set frames which were inscribed with Roman numerals (commencing with I for the mainframe). The hull is holed where the ship struck the nearby rocky coast.

Nieto, 1989: 261-339.

See also **Cap de Creus**, **Cova del Infern**, **La Masa d'Or**, etc.

**CYPRUS** 350 Map 1 Cyprus

34° N. 34° E. On the S. coast of Cyprus. Depth: uncertain.

Amphoras. Late 2nd century BC (?).

A wreck in Cyprus with stamped Rhodian amphoras has not been reported in print. The stamps seen by the writer (in 1973) were unfortunately not legible.

Unpublished.

**DATÇA A** 351 Map 13 Turkey

36° 43' N. 27° 41' E. (approx.). Somewhere near Datça. Depth not reported.

Amphoras. 5th-mid 7th centuries AD (?).

A perfectly preserved wreck with a cargo of Byzantine amphoras has been briefly reported.

Frey, 1982: 5.

**DATÇA B** 352 Map 13 Turkey

36° 39' N. 27° 40' E. (approx.). Off the S. side of the Datça Peninsula; in deep, silty sand. Depth: 49 m.

Amphoras. c. AD 650-725.

A recently discovered Byzantine wreck has a cargo of globular and baluster-shaped amphoras. The hull is well preserved.

Pulak, 1988: 10-11.

**DATÇA C** 353 Map 13 Turkey

36° 43' N. 27° 26' E. (approx.). On the NW. side of the Datça Peninsula; scattered down a cliff, between 3 and 15 m deep, and lying at its foot, in 37 m.

Amphoras. Late 3rd-early 4th century AD.

A deposit of amphoras of several types was discovered by an INA survey in 1987 in deep water off a point where scattered amphora fragments had been noted previously; the two deposits probably belong to a single wreck. The published amphoras are of forms Kapitän 1 and Robinson K 114.

Pulak, 1988: 11.

**DATTIER, LE** 354 Map 5 France

43 9' N. 6 31' E. Off Pointe du Dattier, near Cavalaire (also known as 'Cavalaire'). Depth: 38 m.

Amphoras. c. 550-525 BC.

On a sandy bottom lie the remains of an archaic Etruscan ship. The broken amphoras lay closely together over an area 8 x 6 m. The cargo was of Etruscan amphoras; some 'Graeco-Massiliote' amphoras were also found, but these were in a minority, according to Bouloumie. The Etruscan amphoras were pitched inside, and therefore presumably carried wine.

The ship's equipment included the lower part of a stone mill, identified by Calmes as part of a lever-mill, but more likely a saddle quern. Also found was an anchor-stock, made from schist, which has mostly lost its shape. The site was savagely looted after its discovery in 1973; the main part of the wreck (and any surviving timbers) may not have been discovered.

Liou, 1974a; Calmes, 1976; Gianfrotta, 1977: 287 ff.; Koehler, 1981: 454; Bouloumié, 1981.

**DATTILO** 355 Map 11 Italy

38° 38' N. 15° 5' E. Close to Scoglio Dattilo (E. of Panarea). Depth: 32-34 m.

Pottery. Early 4th century BC.

A cargo of black-gloss ware lies on an active volcanic bottom, and is under excavation by M. Bound. The pottery forms found include cups, plates, bowls, lamps, a jar and a miniature jug. A single amphora may represent shipboard stores; some copper nails and two fragments of wood are all that has been found of the ship. According to divers, olive pits and lead rings were found at the site before archaeological work began. Preliminary reports dated the wreck to the 5th century, but further work has shown that it more likely belongs in the first quarter of the 4th century BC. The origin of the pottery remains to be definitely established, though some of the cups (skyphoi) appear to be South Italian rather than Attic.

Yellowlees, 1987; Bound, 1988a; 1989a; 1989b; 1990.

Information: M. Bound; D. Gibbins.

**DEEP TOW SITE** 356 Map 1 -

34° 35' N. 29° 19' E. Between Turkey and Libya; on a smooth bottom. Depth: 2360-2385 m.

Amphoras. 3rd century BC.

Detailed mapping of the seabed by the Deep Tow Vehicle of Scripps' Institution of Oceanography revealed two amphoras, lying 175 m apart along the path of the survey still photo camera. One was Rhodian, the other Coan, and they could well be contemporary. Between the two amphoras the camera recorded an unusual feature on the bottom which could be part of a ship (an anchor and cable?). Observation of other deep-water sites has established that cargoes

lost in these conditions are likely to have been partly dispersed by their fall through the water.

Spieß & Orzech, 1981 (site I-B).

### **Delos (Greece)**

A bronze lion, identified as a Hellenistic figure-head, was brought up between Delos and Rheneia; there is no report of any associated material.

Touchais, 1984: 818 (from a press report).

### **DELPHINION** **357** Map 13 Greece

38° 29' N. 26° 7' E. In NE. Khios; site 'Delphinion K' of Garnett & Boardman.  
Depth: 9-10 m.

Amphoras. 5th-6th centuries AD (?).

A large deposit of broken amphoras, concreted, was found in shallow water not far from the coast. The amphoras were of a Byzantine type similar to Riley D 377 (Parian ?) and perhaps of a variety of Riley LR1 (Keay 53). No other finds were definitely associated.

Garnett & Boardman, 1961: 106-111, nos 21-22.

The same authors mention heaps of Chian amphoras, but without detail, in this area, as well as what might be a cargo of Afr. 1 amphoras at their 'Delphinion A' site.

### **DENIA** **358** Map 1 Spain

38° N. 0° E. Found by a fisherman between Denia and Ibiza. Depth: 300-400 m.

Amphoras. c. AD 150-225.

A group of stamped amphoras, form Dr. 20, must be from a deep-water shipwreck. Recorded stamps are **F.SCIM** | **NIANI** and **LFCCVFS**.

Mariner, 1954: 1-7.

### **Denia: a possible wreck**

Two Dr. 2-4 amphoras of Tarraconensian type, found under water off Denia, may represent a wreck.

Parker, 1973a: 417 & fig. 289.

Deux-Frères: see **Cap Sicié**.

**DHIA A**   **359**                             Map 13                             Greece  
35° 25' N. 25° 13' E. (approx.). Close to Dhia island (Crete). Depth: 30 m.  
Amphoras.   1st century AD.

The main cargo of a wreck off Dhia comprised Rhodian amphoras of Roman type; there were also some amphoras of Nubian and Coan types and of Dr. 18 and Dr. 25 forms.

Unpublished.

Information: C. Kritzas.

**DHIA B & C**   **360-361**                             Map 13                             Greece  
35 25' N. 25 13' E. (approx.). Detailed location and depth not reported.  
**A.** Amphoras.   10th century AD (?).

Byzantine amphoras, said to be of 10th century date, made up the cargo of a wreck off Dhia. The amphoras resemble Günsenin form 1.

**B.** Amphoras.   12th century AD (?).

A wreck, said to be of 12th century date, contains amphoras resembling Günsenin form 3.

Unpublished.

Information: C. Kritzas.

**DHOKÓS**   **362**                             Map 13                             Greece  
37 20' N. 23 20' E. At Dhokós island; close to the small, rocky headland of Cape Myti Komeni, on the NE. side of Skindos Bay. Depth: 15-32 m.  
Pottery, etc.   c. 2200 BC (?).

A substantial deposit of pottery lies on a steep slope, below a ledge at 15 m and above sand at 40 m. The pottery, comprising mostly cups, 'sauce-boats', jugs and bowls, is of the Early Helladic II/III period; it is scattered round a deposit of 'ballast stones', and two stone anchors have been found nearby. There are also spit-supports, braziers, and grinding-stones. Two pieces of a lead bar have also been found. The wreck, discovered by P. Throckmorton, is now under excavation by the Hellenic Institute of Marine Archaeology.

Papathanassopoulos, 1976; Throckmorton, 1987: 36; Papathanasopoulos, 1990.

Information: L. Blue; E. French; P. Nicolaidis; P. Throckmorton.

**DHRAPI****363**

Map 13

Greece

37° 15' N. 23° 15' E. At Dhrapi island, between Hydra and Spetsai. Depth: 35-40 m.

Amphoras. 250-50 BC (?).

A wreck with a cargo of Rhodian amphoras lay mostly too far down slope to be surveyed. Of five amphoras recovered, one bore rose stamps. There was also a lead anchor-stock.

Papathanassopoulos, 1980: 166.

**DIANO MARINA****364**

Map 7

Italy

43° 53' N. 8° 6' E. Off San Bartolomeo Mare; 2 km from the coast, on a mud and sand bottom. Depth: 40-50 m.

Amphoras and dolia. Mid 1st century AD.

A large wreck, extending over 30 x 6 m, was discovered in 1975 and partly excavated by N. Lamboglia and F. Pallares. In the centre of the ship were 14 large dolia, arranged in three files; the outer files were each of five spherical dolia, each containing 1,500 litres. There were also two small dolia, one at each end of the central file. The dolia, which must have been fixed in place with bulkheads and wedges, occupied a space 10.5 x 5.5 m; they had terracotta lids and were pitched internally, and some of them had been repaired. Two were stamped **HILARVS M. (ET) P. | [CAE]DICI [SE(RVVS) FECIT]** and one **C.PIRANVS PHILOMVSVS.F** and **C.PIRANVS PRIMVS.FE**; a dolium lid is stamped **FELIX PACAT**. On one of the dolia is a graffito, **PETICI MARSII**; a statuette of Hercules was dedicated at the sanctuary of Hercules Curinus in Samnium by a M. Attius Peticius Marsus, and he must have been the ship's owner (in the view of Gianfrotta, 1989b). There were also at least 1,000 Dr. 2-4 amphoras from Tarraconensis, many of them bearing one or more of 14 different stamps (on shoulder and foot) including **A**, **ASCL**, **C.P.F.**, **HILARI** and **TYR**. There were also pre-firing graffiti. Most of the amphoras came from Can Tintorer. Doubtless the ship's cargo was all wine, some 'bottled' in amphoras, some carried in bulk in dolia. The Pirani of Minturnae (known from other dolia) thus came to deal in Spanish wine by the mid 1st century AD, having earlier dealt in Italian vintages.

Shipboard material includes roof-tiles, two Dr. 7-11 amphoras (one with graffito **ANTHE**), an extensive range of coarseware, some fine-wall ware, a mortarium, Italian terra sigillata with stamps, volute lamps, and a container made of lead. There were also fishing-weights, counters of glass paste, a red cornelian gem (engraved with two Cupids) and a gold ring set with a garnet. The large hull (at first estimated as 40 m long, revised to 22-25 m) was well preserved, including a raised after-deck. In the after part of the ship were found some beams, set into the ship to support the dolia.

Scialla & Pugliese, 1975; Bernardini, 1984; Pallarés, 1983d; 1985b; 1985e; 1987; Corsi-Sciallano & Liou, 1985: 95-107; Gianfrotta & Hesnard, 1987: 290.

**Diano Marina: another site**



Two amphoras of form Beltrán 2B were brought up by fishermen on separate occasions, and suggested to N. Lamboglia the existence of a wreck, though there is no other evidence for it.

Lamboglia, 1952c: 233-4.

**DÓMU DE S'ÓRKU**

**365**

Map 13

Italy

39° 30' N. 8° 26' E. (?). Near Arbus (Sardinia); detailed location and depth not reported.

Ingots.

c. 700-400 BC (?).

A variety of ingots was found in a wreck near the mines of Montevecchio and Ingustosu on the W. coast of Sardinia. There were several ingots, said to be mill shaped, of lead alloy (Pb 64.5%, Sn 12.4%, Al 2.04%) - measuring only about 25 x 17 cm. Others were of rectangular or loaf shape, and there were also some blocks of a copper-tin-lead alloy, as well as lead plaques, some of which had geometric decoration. The date was supplied by the handle of an Iron Age Nuragic jar.

Agus, 1990: 448-9 & pl. I.

**DONUZLAV**

**366**

Map 1

Ukraine

45° 15' N. 33° 0' E. On the W. coast of the Crimea, near ancient Eupatoria. Depth: 4-5 m.

Amphoras.

Late 4th-early 3rd centuries BC.

Remains of a large cargo of Greek amphoras were scattered over an area 140 x 90 m. The amphoras were from Heraclea Pontica and bore stamps, including ΕΥΩΠ | ΙΑΑ, ΜΙΚΟ and ΧΙΩ | club | ΝΟΣ. The date is determined by the amphoras and by a fragment of black-gloss ware with rouletting and palmette stamps. Pieces of the ship's hull survived; copper nails were used extensively, and she was lead sheathed.

Blavatsky & Peters, 1973; Blackman, 1973.

**DOR**

**367**

Map 14

Israel

32° 36' N. 34° 54' E. In Tantura lagoon, by Tel Dor. Depth: 2 m.

Amphoras.

7th century AD.

The bottom of a Byzantine ship, apparently well-preserved, was found in 1983; a T-shaped iron anchor lay nearby. The cargo was of storage jars, probably made locally, laid on loops of rope and packed in place with straw-like plant material.

Wachsmann & Raveh, 1984b.

Information: S. Wachsmann.

For a Bronze Age ingot wreck, said by some to be near Dor, see **Hishuley Carmel**.

**DRAGONERA A** 368 Map 3 Spain

39° 34' N. 2° 20' E. (?). In mid-channel between Dragonera and the main island of Majorca. Depth: 30 m.

Amphoras. c. AD 200-275 (?).

A shipwreck with a cargo of Afr. 2A amphoras has been briefly reported.

Font, 1963.

**DRAGONERA B** 369 Map 3 Spain

39° 34' N. 2° 21' E. W. of Es Pantaleu islet (Majorca). Depth: 19 m.

Amphoras. c. 100-25 BC (?).

A rich deposit of Dr. 1B amphoras lay on a bottom of sand and weed. No other finds have been reported.

Font, 1963.

**DRAGONERA C** 370 Map 3 Spain

39° 34' N. 2° 21' E. (?). Said to be between Punta Caragola and Es Pantaleu. Depth: 4 m.

Amphoras. Date unknown.

Many fragmentary and whole amphoras have been reported from this site, but they are not described or illustrated.

Font, 1963.

**DRAMONT A** 371 Map 5 France

43° 24' N. 6° 50' E. In Saint Raphaël bay; 180 m SW. of Île d'Or, at the foot of a submerged reef. Depth: 35 m.

Amphoras. Mid 1st century BC.

A well-preserved shipwreck with a cargo of Dr. 1B amphoras has been almost completely excavated by C. Santamaria. About 1,000 amphoras have been accounted for. The Dr. 1B amphoras were of three varieties, one of which bore no stamps; these varieties were stowed in different parts of the hold. Recorded stamps are **DAM, EVTA, PILIP, OPEL, BAC, HERACLID, NICOMAC, MOC**, and other, shorter stamps.

(A similar group of stamps was found at **Santa Severa A**). Some seals were found: the only mark on these to be successfully read was **SEX ARRI.M.F.** Some Apulian and Lam. 2 amphoras also probably formed part of the cargo; there were also at least one amphora each of Rhodian and Punic forms (the latter containing olive pits and twigs).

Four lead anchor-stocks have been found at the bow. Each of the two larger stocks was inscribed **SEX.ARR[ I ]**, doubtless the same Sextus Arrius Marci filius as on the amphora seals. This proves that the ship's owner was also either a producer of or a dealer in wine. He was very likely a member of the Arrii family of Minturnae (in S. Latium).

Shipboard items included three lamps, some black-gloss pottery ('Campanian C'), a mortarium, and a variety of coarseware; some of the coarseware was found in the stern, soot-blackened, together with pine branches, many of which were burnt. There was also a stores area in the bow; here were found two Dr. 2-4 amphoras and a Pascual 1, together with various pottery vessels and a rotary hand-mill, with both parts still assembled. A folded sheet of lead, fishing-weights, a piece of spar or handle mounted in lead, some lead piping (found on top of the amphoras), and part of a bronze helmet were also found. Two coins (a Republican as with Rev. prow and a denarius of 82 BC) have been reported.

Successive excavation campaigns have clarified the construction of the ship; like the contemporary **Madrague de Giens**, she was double-planked. There was no lead sheathing. Between the two layers of planking was some fabric soaked in pitch, and the internal planks and the frames had been brushed over with some protective coating. Both treenails and copper nails were used in the hull construction; iron nails were also used, exclusively to fasten the first two planks to the frames, thereafter at wider intervals, together with tree-nails. The stern was reinforced with an additional timber externally, scarfed with iron nails to the end of the keel and fastened to the sternpost with iron bolts. Other pieces of the structure appear to be a deckbeam and a steering-oar blade. The shape of the hull has not been reconstructed, but it is already certain that bow and stern were of different fore-and-aft profile, and that the cross-section was relatively fine. Overall, the hull must have measured more than 25 m in length and 7 m at the mainframe.

(The Dr. 2-4 amphora published by Santamaria et al. (1965: fig. 36.3) does not in fact come from this wreck).

Santamaria, C. et al. in Taylor, 1965: 93-103; Santamaria, 1973; 1975; 1982; Cahiers d'Archéologie Subaquatique, 1 (1972): 26; Joncheray, 1976d: figs 73-4; Fiori & Joncheray, 1973: IV. 5 & VI. 9; Liou, 1973: 593-5; 1975: 598-600; DRASM, 1985: 64; Liou & Pomey, 1985: 568-72; Colls, 1986: 204.

Information: A. Tchernia.

**DRAMONT B**

**372**

Map 5

France

43° 24' N. 6° 50' E. Near wreck A; 80 m SE. of the reef which extends SW. from Île d'Or. Depth: 36-39 m.

Amphoras.

Early 1st century AD.

Only brief details have been published of a shipwreck with a cargo of Dr. 2-4 amphoras. The amphoras, from Tarraconensis, include two which are stamped **FI & D** and **CIAS & [ ]A**. An ovoid amphora of form 'Tarraconense 1' (cf. **Palamós**) and a small amphora of uncertain identification represent shipboard stores; there are also some cooking ware, Arretine, and Iberian pottery.

Benoit, 1960: 52-3; Joncheray, 1971: V. 2-3; Corsi-Sciallano & Liou, 1985: 71-7.

**DRAMONT C**

**373**

Map 5

France

43° 24' N. 6° 50' E. On the SE. side of Île d'Or. Depth: 42 m.

Amphoras, resin and iron bars. Late 2nd century BC.

A scattered site, 'of varying date', at Le Dramont was referred to by Benoit (1960); to it he assigned the amphora with bifid handles which had earlier been attributed to the Dramont A wreck (Benoit, 1958: 20-1). According to Joncheray (1973a: 34, n. 47) this amphora is labelled 'cimetièrre marin du Lion de Mer', and Benoit (1960 in fact wrote 'Épave C [sc. du Dramont]. Lion de Mer'. However, Lion de Mer is some 6 km W. of Île d'Or, and the wreck there is quite different (sv. **Lion de Mer**). The amphora with bifid handles thus probably does not come from Le Dramont at all.

On the site of Dramont C Benoit reported the remains of a cargo of Dr. 20 and flat-bottomed amphoras, together with 'oil amphoras' and a lead anchor-stock. Recent excavations by J-P. Joncheray (unpublished) have, however, revealed a cargo of early Dr. 1B amphoras and other goods. There were 120 Dr. 1B and a few Lam. 2 amphoras, about 50 long iron bars (laid on dunnage of vine branches), blocks of pine resin, several complete mills and half a ton of ballast stones. Pottery and metal objects were found in such number that they, too, may have been trade goods. The ship carried one iron and three lead-stocked anchors. The hull was only 12-13 m long, of oak keel and frames and Aleppo pine planking. A working floor of flat stones (to port, forward) was being used during the voyage to make cork amphora stoppers, emphasizing, like the stamp at **Cap Negret** and the inscriptions from **Diano Marina** and **Dramont A**, that wine merchants took an active role in sea trade.

Benoit, 1960: 53; Joncheray, 1972a: 13.

Information: J-P. Joncheray; A. Tchernia.

**DRAMONT D**

**374**

Map 5

France

43° 24' N. 6° 50' E. 530 m SW. of Île d'Or. Depth: 55 m.

Amphoras and mortaria. c. AD 40-50.

The wreck, when first seen, extended 18 x 6 m, with tilted piles of mortaria and the necks of amphoras protruding from a muddy bottom. The mortaria were of two main varieties. The first, with a flat rim, was in four sizes (27, 33, 40 and 46 cm diameter); one was stamped **HERM[ ]**. The second variety, wall-rimmed, was larger and heavier than the first, and mostly stamped; the four stamps found are **M CAENI SALVITTO**, **ST MARC ANTHVS**, **ST MARC STATOR FEC**, and **C SATRINI COMMVNI**. The last three stamps are of the Figlinae Marcianae, probably situated near Rome. The cargo amphoras were of two kinds. Some were Rhodian, with (in some cases) a Greek stamp on the handle; all or most of these contained the remains of figs. Others were of Dr. 2-4 form, of several varieties, thought by Hesnard to be Italian, but more likely, as Panella suggests, from the Aegean region; two of these contained dates. Also stowed in the ship's hold as cargo was a set of four bronze pumps, one signed by the maker **CLAV[DIVS] F[ECIT]**.

The ship's equipment included one lead-stocked and three iron anchors, two

sounding-leads, several lamps and a lead jar. The stores included a Rhodian amphora full of resin, a Spanish fish-sauce amphora, and a small jar full of flour. Five rilled amphoras (of form Kingsholm 117) were found in the same area and were also therefore probably stores. Cooking utensils comprised several pots with sagging bottoms, a flat dish, various lids, a bronze jar, and four bronze skillets; pieces of charcoal were found in several places and show that there was a fire on board. Eating and drinking equipment comprised Arretine cups and plates (some inscribed with the graffito **MVST**) and a fine-wall goblet, several jars, jugs, and miscellaneous coarseware vessels, and six 'Pompeian Red' ware dishes. A basket of copper nails, together with an axe, gimlet, graver, axe-hammer, key, knife and other tools, enabled repairs to be carried out. There was also a bronze inkwell, with traces of ink still inside.

Not much is known of the ship's hull. Part of a spar was found. The position of the stores as excavated showed that there were two 'messes', 12 m apart; the one to the W. (the ship's orientation is not certain) contained fewer but richer objects. No tiles were found, and no hearth for cooking.

Tchernia, 1969: 469-70; Joncheray, 1972a; 1973; 1974b; 1975c; Hartley, 1973; Rouanet, 1974; Hesnard *et al.*, 1977: 186 & 293; DRASM, 1985: 69; Panella, 1986: 618, note 13; Leuthner, J. & Stender, E., 1989.

**DRAMONT E** 375 Map 5 France

43° 24' N. 6° 50' E. North of wreck D, towards the coast. Depth: 40-42 m.

Amphoras. c. AD 420-425.

A well-preserved wreck of late Roman amphoras lay on a sandy bottom off the beach of Le Dramont. Many of the amphoras were of a large cylindrical form (cf. Keay 35). Also present (sometimes slipped in between these large amphoras, and stacked round the foot of the mast) were slender 'spatheion' amphoras, of two sizes (Keay 25); several contained olive-pits. Both forms of amphora are of Tunisian origin. Fore and aft of the amphoras lay a large consignment of t.s. chiara D and other late Roman sigillata. When the wreck was discovered in 1965, a tumulus of three layers of upright amphoras rose proud of the bottom; no work was authorized on the site till 1968, when an official survey was made of the remaining, bottom layer of amphoras. The site, now mostly cleared of sand, was then left by the authorities, with the (doubtless unintended) result that by 1972 only broken, disturbed amphoras remained. Excavations have since been resumed under C. Santamaria.

The wreck is dated by a number of coins of the period AD 383-423. The remains of several large iron anchors lay on deck, five forward and two or three aft. Shipboard items included a sounding-lead, two weights (bronze with a lead core) weighing 11.6 kg and 96 kg, a rotary hand-mill of limestone and some 'vaulting tubes'. Pottery so far reported comprises two jugs and a platter.

The estimated original size of the ship is 15-18 x 5-6 m. The mast-partners, the foot of the mast and the mast-step survive, as does the pump-well.

Tchernia, 1969: 470-2 ('Drammont Plage B'); Chevalier & Santamaria, 1973; Joncheray, 1975b; Santamaria, 1984a: 51; 1984b; DRASM, 1985: 108-9; Pomey *et al.*, 1989: 40-41.

**DRAMONT F** 376 Map 5 France

43° 24' N. 6° 49' E. 1.8 km W of Cap Dramont. Depth: 57-58 m.

Amphoras.

c. AD 400.

Only 120 amphoras made up the cargo of this small wreck. The amphoras were ten varieties of late Roman cylindrical amphoras, some resembling 'spatheia'. These were all filled to the brim with resin; the mouth was stopped with a plug of straw or twigs, above which was a seal of mortar. There was also one amphora of form Almagro 51A; it is not known whether this, too, held resin. A flat-bottomed amphora (Keay 52, a Calabrian wine-jar) may also have been part of the cargo.

The shipboard equipment comprised a terra sigillata chiara D dish, a jug of t.s. lucente (?), some coarseware, and a bronze pitcher. Four iron anchors, 1.36-1.70 m long, were found, without their stocks; they were stacked at one side of the ship. The hull was constructed with mortice-and-tenon joints, but had only a slight keel. The ship was not lead-sheathed, but was covered with pitch inside and out. All the frames were apparently continuous floors. The iron nails used to attach the ceiling passed right through the floors and the planking and were clenched over, if they protruded, at the tip. The ship can have been only 10-12 m long and 4-5 m beam; the weight of the cargo, as discovered, was merely some 3 tonnes. She must have been engaged in local traffic, carrying resin produced in the nearby region. The wreck can be dated to the last years of the 4th or the early years of the 5th century AD.

Joncheray, 1975d; 1977; Arthur, 1989: 134-8.

#### **DRAMONT G**

377

Map 5

France

43° 24' N. 6° 49' E. To the W. of Cap Dramont. Depth: 48 m.

Tiles and pottery.

c. AD 60-70.

Perfectly preserved in a flat, muddy bottom, this wreck, containing both tegulae and imbrices as well as a substantial quantity of pottery, was substantially destroyed by looters. What remained of the site was later excavated by J-P. Joncheray. The tiles were unstamped, and of rather coarse finish. The pottery included at least 40 stamped terra sigillata cups from La Graufesenque, and between 100 and 200 coarseware dishes, bowls and jars. Other pottery comprised two jars, a conical cup and a lamp. A collection of tools included a scraper, a hammer, an axe, a harpoon, a burin, a large ring, and iron and bronze nails. Nearly all the ship's structure was destroyed following the looting of the cargo; a fragment of keel survived. Also found was an iron anchor, with a stone (schist) stock still in place. The cargo was evidently assembled locally; some of the coarseware was made at Fréjus, the rest probably close to the wreck site. The ship was small (originally not more than 11 m overall at the most) and the cargo seems to have weighed only 2½-3½ tons.

For a similar wreck, see Les **Roches d'Aurelles**.

Joncheray, 1976e: 259; 1986; 1987a: 51-72.

#### **Dramont H**

A mid 18th century wreck.

Unpublished (information: J-P. Joncheray).

**DRAMONT I** **378** Map 5 France

43° 24' N. 6° 50' E. (?). Detailed location not reported. Depth: approx. 30 m.

Stone blocks. Roman period.

A cargo of stone blocks, apparently not marble, was recently discovered by J-P. Joncheray. The blocks measure approx. 4 x 1 x 1 m, and are of Roman date.

Unpublished.

Information: C. Brandon.

**DRUTEN** **379** Map 15 Netherlands

51° 53' N. 5° 37' E. In a silted meander of the R. Waal.

No cargo. c. AD 200.

The remains of a Roman barge had been truncated by a bulldozer; 16 m remained, and the complete vessel must have measured at least 27 m long. The general construction was similar to that of other Roman Rhine boats (eg. **Zwammerdam**), though it is not known whether the Druten boat was single- or double-ended. At the surviving end there was a quarter-deck, or perhaps a cabin. Equipment included a pole-fitting and an axe. The wreck is well dated by red-gloss and colour-coated pottery and an imperfectly legible coin to the end of the 2nd or the early years of the 3rd century AD. The bottom (which was ceiled) was covered with small pieces of slate, testifying to the last cargo carried.

Hulst & Lehmann, 1974; Lehmann, 1978.

**DUNAS DEL PINATAR** **380** Map 2 Spain

37° 48' N. 0° 45' W. (?). Near San Pedro del Pinatar (Murcia); location and depth not reported.

Amphoras. c. AD 1-250 (?).

A wreck of Dr. 20 amphoras has been summarily reported.

Más, 1985a: 162.

**Elba**

For wrecks off Elba, see **Acquaviva, Capo Enfola, Capo Sant'Andrea, Capo Vite, Chiessi, Corbella, Mola, Pomonte, Porto Azzurro, Procchio, Punta Cera and Zanca**. There probably are wrecks at other sites, especially Patresi and Le Formiche della Zanca, but the information available is inadequate for classification (see Lamboglia, 1974: 180; Zecchini, 1982: 81, etc.). Not all the wreck-sites listed by Pallarés (1983b) have been included in this Catalogue.

**ELORO A**                                        **381**                                        Map 11                                        Italy

36° 50' N. 15° 11' E. (approx.). Off Eloro (Sicily); said to be 2 km off-shore. Depth: 57 m.

Amphoras.                                        c. AD 300-450 (?).

A shipwreck with late Roman cylindrical amphoras (Keay 25) had been found in the summer of 1979 by divers who were stopped and questioned by the coast-guard at Vendicari (E. Sicily). They reported that there were also anchors at the site. Either the depth or the distance from shore is incorrect, and the site is probably more like 4 km off the coast.

Unpublished.

Information: Soprintendenza Archeologica (Siracusa) and Guardia di Finanza.

**ELORO B**                                        **382**                                        Map 11                                        Italy

36° 50' N. 15° 11' E. (approx.). Near Eloro; detailed location and depth unknown.

Amphoras (?).                                        3rd-2nd centuries BC (?).

A shipwreck with a cargo of Graeco-Italic amphoras and with black-gloss pottery either as cargo or as shipboard items was investigated by 'Aquarius' in 1980, but nothing has been published.

Unpublished.

Information: G. Kapitän.

**EMBIEZ, LES**                                        **383**                                        Map 5                                        France

43° 4' N. 5° 46' E. At Île des Embiez; detailed location and depth not reported.

Amphoras.                                        c. 150-50 BC (?).

A wreck with Dr. 1C amphoras has been summarily reported.

Carrazé, 1970d.



**EMPOLI****384**

Map 7

Italy

43° 43' N. 10° 57' E. In a branch of the R. Arno (Tuscany).

Cargo not reported.

14th century AD.

A half-submerged wreck, 11 m long, with a cargo of goods (unspecified), is said to be of 14th century date.

Gandolfi, 1983: 290 (from a press report).

Encalladora, L': see **Cala Culip**.

Enfola: see **Capo Enfola**.

**ERDEK****385**

Map 13

Turkey

40° 28' N. 27° 45' E. (?). Location and depth unknown.

Amphoras.

10th-12th centuries AD (?).

A fairly large group of Byzantine pear-shaped amphoras (Gülsenin Type I) in Bursa museum comes from an otherwise unknown wreck off the village of Erdek-Marmara. For another wreck in this area with the same type of amphoras, see **Hayirsiz Ada**.

Gülsenin, 1989: 269-71.

See also **Halkoz Adasi**.

Ermitage, L': see La **Madrague de Giens**.

Escampobariou: see Les **Fourmigués**.

**ESCOLLETES A, LOS****386**

Map 2

Spain

37° 44' N. 0° 43' W. At Estacio, near Isla Grosa (Murcia); detailed location and depth not reported. This is 'Escolletes-2' of Mas, 1977, or 'Escolletes-I' of Más, 1985a.

Amphoras.

3rd century AD (?).

Two wrecks were found together at the foot of a harbour mole; though close together, they are distinct. The first has amphoras of form Almagro 51C. Also found were fine tableware and glass.

Más, 1977; 1985a.

**ESCOLLETES B, LOS** 387 Map 2 Spain

37° 44' N. 0° 43' W. Close to wreck A. This is 'Escolletes-1' of the 1977 report, 'Escolletes-II' of 1985.

Amphoras and terracotta pipes. 3rd-4th centuries AD.

The cargo of this wreck consisted of bag-shaped amphoras (probably a local type of Dr. 38) and 12 cm long 'amphorisks' or vaulting-tubes.

Más, 1977; 1985a.

See also Los **Esculls**, **Punta de Algas** and **San Ferreol** for sites in this area.

Escollo: see **Cabo de Gata**.

**ESCOMBRERAS** 388 Map 2 Spain

37° 33' N. 0° 58' W. The wreck 'El Capitán', on Escombreras island (Cartagena); at the foot of a cliff. Depth: 28-34 m.

Amphoras. c. 140-100 BC.

A large cargo of Dr. 1A amphoras lay in two groups. No other type of amphora has been found at the site. Other finds include unguent-flasks, discs, and miscellaneous pieces of lead, a copper bucket, and black-gloss pottery, as well as anchor-stocks, tiles, terracotta blocks (perhaps weights), and, apparently, ballast. A similar amphora from another site has been dated to 119 BC by a painted inscription.

Más, 1972: 69-70; 1977; Blánquez, 1982: 54.

**Escombreras: other finds**

One or more cargoes of S. Spanish amphoras (1st-2nd centuries AD) may have been wrecked at Escombreras, where amphoras of various types have been collected over an extensive area. Hundreds of amphoras are said to have been seen, but the published report gives no solid basis for identifying a wreck among what could be mostly anchorage debris.

Jaureguí, 1948; Beltrán, 1970: 438.

**ESCULLS, LOS** 389 Map 2 Spain

37° 48' N. 0° 43' W. (approx.). Near San Pedro del Pinatar. Depth not reported.

Amphoras and pottery. c. 100-25 BC (?).

A wreck of Dr. 1C amphoras and black-gloss pottery has been briefly reported. The pottery appears to be Camp. B and some more evolved types, with fine, reddish clay and brilliant black gloss; there are plates, cups and bowls. Some coarse pottery and a large mortarium were also found.

Más, 1978.

### **Espiguette, L' (France)**

An Etruscan wreck referred to by Benoit (1965a: 56) at L'Espiguette light, near Grau-du-Roi, has not been mentioned in later publications discussing Etruscan sites, and may therefore be discounted.

**ESPINES, LOS** 390 Map 2 Spain

37° 43' N. 0° 43' W. (?). Named after its discoverers, the brothers Espín; location and depth not reported.

Amphoras. c. 25 BC-AD 50 (?).

A cargo of fish-sauce amphoras (Dr. 7-11) has been only briefly reported.

Más, 1985a: 164-5 & fig. 6. 2.

**ESQUILLADE, L'** 391 Map 5 France

43° 3' N. 6° 32' E. At L'Esquillade rock, Île du Levant. Depth not reported.

Amphoras. c. 150-100 BC (?).

A wreck of Dr. 1A amphoras at L'Esquillade (just E. of **Titan**) has been summarily reported. Given the location, the site ('gisement') may well be contaminated, but there is no obvious reason to doubt that this is a distinct wreck.

Carrazé, 1970d.

**EST-PERDUTO** 392 Map 6 France

41° 22' N. 9° 20' E. 3 km NE. of Perduto island (S. Corsica). Depth: 87 m.

Amphoras. AD 1-50 (?).

A tumulus of Dr. 2-4 amphoras, said to be 10 m or more in extent, was found by a coral-diver freeing fishing-nets. The amphoras are of Tarraconensian type, and include one stamped **APO**. Also from the wreck is an Ibizan amphora.

DRASM, 1985: 101-2, no. 435; Corsi-Sciallano & Liou, 1985: 148-52.

Estartít: see **Isla Pedrosa** and **Punta Salina**.

**ESTÉREL, L'** **393** Map 5 France

43 1' N. 6 11' E. One mile SE. of Cap de l'Estérel. Depth: 23 m.

Amphoras. c. 100 BC (?).

A wreck with a cargo of Dr. 1A amphoras was partly excavated by F. Carrazé, despite damage by trawls and by looters. There were five varieties of Dr. 1A amphora, with stamps in a series of two-letter groups (**AF, AG, AI, AK, BF**, etc.) combined with potters' signatures; these amphoras had seals marked with three oval impressions showing a human head. Shipboard items included amphoras of forms Dr. 1B, Dr. 1C and 'Dr. 2' (Coan?), as well as black-gloss pottery, two mortaria, and a decorated bronze helmet. Nothing is known of the ship, though a lead anchor-stock was found.

The amphoras were probably made at Parrina, in the Cosa area of Etruria; for similar amphoras, see **Plane D**.

Tchernia, 1969: 475-6; Carrazé, 1970b; 1970d; 1972b: 127; 1976a: 69-70, fig. 4; Liou, 1975: 589-90; Manacorda, 1981: 25-8.

**ESTEÜ DOU MIEÜ A** **394** Map 5 France

43° 11' N. 5° 22' E. At the reef of Mieü (or Miet), near Ile Plane or Calseragne. Depth: 18-20 m.

Amphoras and pottery. c. 575-525 BC.

Fragmentary remains of a cargo of Etruscan amphoras and bucchero nero, collected from a site previously described as a 'graveyard of ships', has enabled a wreck comparable with **Cap d'Antibes** to be identified near Marseilles.

Liou, 1975: 583-4; Bouloumié, 1981.

**ESTEÜ DOU MIEÜ B** **395** Map 5 France

43 11' N. 5 22' E. 'Épave 4 de l'Estéü dou Mieü' (wrecks 2 and 3 have not been published). Depth: 20-25 m.

Amphoras. c. 200-180 BC (?).

A wreck of Graeco-Italic amphoras, of two sizes, scattered and broken, has been badly damaged by trawls. A guttus and a lamp in Campanian black-gloss ware from the site, if they belong, fix the date.

DRASM, 1983: no. 65; Pomey et al., 1989: 18.

**FANO****396**

Map 8

Italy

43° 54' N. 13° 5' E. (approx.). In the Adriatic, off Fano; location and depth unknown.

Amphoras. 2nd-1st centuries BC (?).

A cargo of amphoras, apparently of form Lam. 2, is known only from finds (some preserved, others dispersed on the market).

Profumo, 1986.

**Fano: bronze statue site**

The 'Getty Bronze', a 4th-century BC bronze statue of a youth binding his hair, was very likely fished up off the Adriatic coast near Fano in 1963 or 1964, but there is no record of any associated finds.

Profumo, 1986.

**FAVARITX****397**

Map 3

Spain

40° 0' N. 4° 16' E. At Cape Favaritx, near Es Capifort (Minorca); by a rock which is submerged 2 m in calm weather. Depth: 22 m.

Bronzes. c. AD 450-600.

A cargo of bronze objects was scattered, much of it in concretions, over a rocky bottom with patches of sand. The cargo included hundreds of plates, keys, chains, etc., and also candelabra, statuettes, balances, coins (dating from Antiochus I of Syria onwards), nails, and part of a pump. There were also some irregular ingots of bronze, presumably already made from scrap similar to the rest. Certain items, such as some weights of brass with a lead core, could have belonged to the ship (of which no remains have been found); some coarseware and an amphora must have been in use on board. This site, discovered in the 1960s, was looted by locals; a large collection was sold in Majorca, some is known to be on Ibiza, and quite a lot was in the hands of a London auctioneer during 1970-1.

The wreck can be interpreted as a ship carrying a metal-worker who was supplying liturgical items to the Balearic Islands. The affinities of the pottery and the Byzantine bronzes indicate an Eastern origin in Egypt or Syria.

Fernández-Miranda, 1977: 821-3; Fernández-Miranda *et al.*, 1977: 95-102; Keay, 1984: 654; Fernández-Miranda & Rodero, 1985.

Information: G. Turner; L. Weier. Some material seen by the writer.

Favignana: see **San Nicola**.

**Favone (France)**

At Favone, an anchorage on the E. coast of Corsica where ships would await a favourable wind for the crossing to Ostia, material found includes late Roman amphoras, but no certain evidence of a wreck has been forthcoming.

Bebko, 1966; Fonquerle, 1972: 62.

**FEMMINA MORTA**

**398**

Map 11

Italy

36° 48' N. 14° 29' E. Near the low hill of 'Fimminamorta', W. of Punta Secca (Sicily); on submerged rocks, close to shore. Depth: 3-4 m.

Amphoras and pottery.

Early 4th century AD (?).

A wreck with a cargo mostly of Afr. 2B-D amphoras lies scattered on a rocky tableland and in sand-filled gullies. The Afr. 2 amphoras were lined with pitch and stopped with a cork disc; no complete amphoras were found, and there is no indication of their original contents. Six other varieties of cylindrical amphora (including Keay 3A sim. and 81) were present, probably also cargo, but in smaller quantity. Some pear-shaped amphoras (Almagro 51C) were found, and also some fragments of the 'Tejarillo 1' variety of Dr. 23. The cargo of this wreck, like **Cabrera C**, thus included both African and Hispanic amphoras. Also part of the cargo was some t.s. chiara D, mostly plain cups, dishes and plates; these appear to belong to the early years of the 4th century AD, though Guerrero proposes a date in the bracket AD 300-375. Various pieces of coarse pottery were found; so, too, were about a dozen (mostly fragmentary) 'vaulting tubes', which could have been part of the ship's equipment. There were also two wooden toilet combs; these might have been merchandise rather than personal possessions.

Some pieces of the ship's keel, frames and planking survived, as well as fragments of lead sheathing. Only a survey and a small test excavation have taken place.

Parker, 1976; Tortorella, 1981: 364-5; Guerrero, 1988: 32.

**FETHIYE**

**399**

Map 13

Turkey

36° 35' N. 28° 50' E. Off Kurdoğlu Burun, W. of Fethiye. Depth: 49 m.

Amphoras.

Late 4th century BC.

A cargo of Greek amphoras, mostly Rhodian, has been briefly reported. From the wreck came some lead sheathing fragments, one of which retained the profile of a wale, whose dimensions suggest a small vessel.

Pulak, 1985a (site 2).

**FILFLA**

**400**

Map 12

Malta

35° 49' N. 14° 20' E. (approx.). Material found by dredging, 8 km WNW. of Filfla (Filfila), Malta. Depth unknown.

Amphoras.

Roman period.

Only a summary report is available of this supposed Roman amphora wreck.  
Sciocluna, 1965; Parker, 1979a: fig. 1, no. 8.

Filicudi: see **Capo Graziano** and **Filicudi Porto**.

**FILICUDI PORTO**

**401**

Map 11

Italy

38° 33' N. 14° 35' E. On the N. side of Capo Graziano, at the S. end of Filicudi Porto bay. Depth not reported (approx. 40 m).

Amphoras. c. AD 475-550.

A wreck with late Roman cylindrical amphoras, known from confiscated finds, was surveyed by N. Lamboglia (results unpublished). Three of the four amphoras which have been published are of form Keay 62, nearest to his variety I, and thus definitely datable to between c. AD 475 and c. AD 550. The fourth amphora (Bernabò-Brea & Cavalier, figs 107-8) is very similar, perhaps a variety of the same form. These amphoras (from Africa) were lined with rosin; their contents are unknown.

Kapitän, 1977a: 47; Bernabò-Brea & Cavalier, 1985: 95-7.

**FIUMICINO**

**402-413**

Map 9

Italy

41° 46' N. 12° 14' E. The remains of several boats and ships, sunken or abandoned in the imperial harbour of Portus, now under Leonardo da Vinci airport (near Rome), have been revealed in construction work; most of them have been preserved. Some details initially reported by Testaguzza are not confirmed in the official account by Scrinari, which is followed here.

- A.** A fishing boat, 5.15 m long, with a central container which could be flooded to keep fish (e.g. lobsters) fresh. Finds from inboard include a boy's leather sandal. The hull section suggests that it was intended to ride lower on the starboard side, for propulsion by a single oar; however, it was not a flat-bottomed lagoon boat, but a coaster type with V-shaped keel section. Date: mid 2nd century AD (C<sub>14</sub>: 1st century BC). (Scrinari no. 1, 'Barca del pescatore').
- B.** A cargo boat, originally 11.5 m long. This boat had a mast-step, and what must be part of a yard was found near the bow; the shaft of a steering-oar was also found. Date: probably 4th century AD (C<sub>14</sub>: late 2nd century AD). (Scrinari no. 2, 'Oneraria minore I').
- C.** A cargo boat, originally 13.5 m long. This boat had two mast steps, but the foremast part was damaged during salvage and storage. Like several of these boats from Fiumicino, the assembly treenails were wedged fast with iron nails driven from outside the hull. Finds from on board included a rigging-block, a pulley, a mat and two lamps; there were also a bronze statuette of Venus, a steelyard weight (representing Caracalla?), a small wooden box, nine bronze coins, an iron instrument with a bronze head and sheath, a bone netting needle and a treenail with a knot, perhaps used for

stretching ropes taut. Carbonized remains comprised pine-cone scales and pine-husks, shells of walnuts and hazelnuts, stones of cherry, peach and apricot, and a bean; one cannot say if these were the remains of fuel or of food eaten on board. Date: 4th century (?) (C<sub>14</sub>: late 2nd century AD). (Scrinari no. 3, 'Oneraria minore II').

- D. Part of the side of a boat, rather larger than wreck B. Date: 3rd-4th century AD (C<sub>14</sub>: first half of 2nd century AD). (Scrinari no. 4).
- E. Part of the side of a large cargo ship, including two wales; only treenails were used in the assembly. (Scrinari no. 5).
- F. A cargo boat, originally 21-22 m long. The keel was joined to the frames by seven large iron bolts; the planking incorporated a reused strake, branded **TRITUTA**. Most of the boat was of evergreen oak (*Q. ilex*), like the others in this series, but the sternpost in this case was of deciduous oak (*Q. robur*); it shows where a decorative bronze overlay had been attached. Finds from on board included a lamp and a bronze plate with silvered decoration. Beneath the port side was found the skeleton of a young man, trapped there when the vessel sank. Date: 4th century AD (C<sub>14</sub>: early-mid 2nd century AD). (Scrinari no. 6, 'Oneraria maggiore I').
- G. A cargo boat, originally 24 m long. Finds from beneath the hull included an amphora full of tar, some three-strand cable and a wooden knife-handle. Carbonization of the timbers showed that the vessel had been destroyed by fire while riding light in the water. Date: 3rd-4th century AD (C<sub>14</sub>: early-mid 2nd century AD). The carrying capacity of vessels F and G is reckoned by Scrinari at 50-80 tons, say 1,120 amphoras. (Scrinari no. 7, 'Oneraria maggiore II').
- H. A boat, remains measuring 4.4 m long, found near the harbour entrance and not preserved. (Scrinari no. 8, 'Scialuppa').
- J. A boat, 11.3 m long, was found near the N. angle of the Trajanic harbour basin in the 1920s (Ucelli, 1950: 251-2).
- K. In the left-hand end of the outer harbour mole; a boat, 22 x 7.5 m, filled with concrete and sunk at the junction of the first and second sections of the outer harbour mole (perhaps not part of the original phase of construction). The shape of the vessel is preserved in the concrete as mould-marks.
- L. Another ship represented by concrete mould-marks in the mole; 26 x 8 m. Like wreck M, this dates from the construction of Portus Claudius, between AD 42 and AD 66.
- M. The concrete cast of the ship used by Caligula to bring an obelisk from Egypt, and set in the Claudian harbour mole as the base of the lighthouse. The length was 104 m (waterline, 90 m), the beam 20.3 m. Testaguzza considers that there were six decks, and the displacement was 7,400 tons. Few modern vessels have been so large.

Testaguzza, 1970; Scrinari, 1979; Ressmann, 1981.

#### **Flavigny-sur-Moselle (France)**



A dugout which had evidently constituted part of a raft, found in a gravel-working near the R. Moselle, is dated by C<sub>14</sub> to AD 540±80, and so lies outside the scope of this catalogue; such craft must have been widely used in the Roman period, however.

Lagadec, 1983.

**FONDANA AMOROSA** 414 Map 1 Cyprus

35° 5' N. 32° 18' E. Near the NW. tip of Cyprus; on a shelf. Depth: 30 m.

Amphoras. Roman period ?

A large quantity of amphoras 'and other artefacts' (unidentified) have been confidentially reported by a diver. A sounding lead of normal Roman type was raised from the site.

Unpublished.

**FONTANAMARE A** 415 Map 6 Italy

39° 16' N. 8° 26' E. At Fontanamare (or Funtanamare), Sardinia; in a relatively protected gully on an exposed reef. Depth: 6-7 m.

Amphoras and pottery. c. AD 290-310 (?).

Only summary reports have been published of a wreck with a rather broken-up cargo of Afr. 2 amphoras, African coarseware of the grey-walled and black-rimmed type, and a consignment of t.s. chiara A/D. Several hundred coins and at least one gold ring, which had been in a bag, were found; according to Lamboglia (Lipari, 1976) the latest were pre-reform coins of Diocletian, but Tortorella, who may have more detailed information, dates the wreck c. AD 305-310.

Shipboard finds were a bronze steelyard with a weight, brooches, a mirror, a spatula, and the wooden handle of a knife or mirror. No remains of the ship have been reported.

Lamboglia, 1972b: 448-9; Pallarés, 1977b; Manacorda, 1975/6: 279; Ferrandi, 1980; Tortorella, 1981.

**FONTANAMARE B & C** 416-7 Map 6 Italy

39° 16' N. 8° 26' E. (approx.). No details have been reported of two wrecks near Fontanamare.

B. 'Republican' - 2nd-1st centuries BC (?).

C. Of unknown date, probably ancient.

Unpublished.

Information: N. Lamboglia (Lipari, 1976).

**FORMENTERA****418**

Map 3

Spain

38° N. 1° E. At an unknown location off Formentera (Balears).

Copper ingots.

c. 1500-1000 BC?

A wreck apparently of copper oxhide ingots was found by a local diver near Formentera, but nothing more is known of either the site or the cargo.

Unpublished.

Information: S. Wignall.

Formiche della Zanca: see **Zanca**.

**FORMICHE DI GROSSETO A, B & C, LE 419-421**

Map 7

Italy

42° 33' N. 10° 53' E. (at Middle Rock, Formica Mezzana). At a chain of three rocks, N. of Giglio (Tuscan Islands), there are three Roman wrecks. Depth: 40-60 m.

No information is available about the forms of amphora found, or the date. The existence of one wreck, 60 m deep, with a lead anchor-stock, has been confirmed by a diver; this is probably the site referred to by Lamboglia, who summarily reports the recovery of Roman amphoras. No mention of Le Formiche di Grosseto is made by Martelli et al. (1982).

Zecchini, 1971: 192-4; Lamboglia, 1972a: 427.

Information: R. Hale.

Formiche di Panarea: see **Panarea**.

Formigues, Les: see **Palamos**.

**FOS A****422**

Map 4

France

43° 25' N. 4° 56' E. The 'épave Fournon', 1 km off Fos-sur-Mer. Depth: 8-10 m.

Amphoras.

c. 50-25 BC.

A wreck covered in sand contained Dr. 1B amphoras, mostly stamped **MAHE**, some **TIMOTES**; **MA** and **NON** may also belong; **MI**, **SAMI** and **DADE** (or **DADB**) are less certainly identified or provenanced. The amphoras stamped **MAHE** were made at Albinia in Etruria, according to Giacobbi-Lequément, but perhaps rather at Canneto in Lazio, according to Hesnard et al. The cargo also included coarseware 'cup-lids', many marked **M.S** internally before firing. Other finds included a pot full of pitch and others lined with pitch, with lids to fit;

various Campanian and other Italian finewares, some handmade coarseware of a type found in W. Provence and around Nîmes, one or two lamps, and an assortment of coarseware. A coin (a ROMA as weighing 37 grammes) must have been over a century old when the ship sank. A Dr. 12 amphora of early type (cf. **Titan**) represents shipboard supplies. The hull was preserved: the frames were irregularly spaced, and the bottom was double-planked, though the outer planking was not fitted to a rabbet on the keel but merely nailed on. Lead sheeting fastened to the inboard face of the first two strakes, an unparalleled feature of Roman ships, could be a repair. A wooden disc of the kind found in ships' pumps has been recovered. Despite the isolated, safe situation of the site, there is 1st century AD and late Roman material, too; this contamination renders uncertain the attribution, eg. of a bronze boar's head, found in 12 m of water nearby.

Benoit, 1958: 37; 1962: 148; Carrazé, 1970d; DRASM, 1983: no. 155; Pollino, 1984: 52-3; Carre & Jézégou, 1984: 133-4; Amar & Liou, 1984; Giacobbi-Lequément, 1987; De Caprariis et al., 1988: 320; Hesnard et al., 1989: 33; Pomey et al., 1989: 11-12.

**FOS B** 423 Map 4 France

43° 25' N. 4° 56' E. Detailed location and depth not known.

Amphoras. 1st century AD.

A number of Dr. 6 amphoras found at Fos-sur-Mer are said to be from a wreck; one has been published. Possibly there has been some confusion with **Aragnon**, since Dr. 6 cargoes are rare; however, the two sites are approx. 15 km apart, the Fos-sur-Mer amphora as illustrated does not closely resemble the two varieties from Aragnon, and it lacks the bold graffito on the body which is a feature of both the amphoras which have been published from the latter site.

Foerster & Pascual, 1973: 290 & fig. 12. 3 (citing an untraced report by R. Diot, 1959).

#### **Fos: other finds**

A large number of Dr. 1 and Lam. 2 amphoras, found during dredging in the new pleasure harbour, E. of Pointe Saint-Gervais, are possibly from a destroyed wreck.

Amar & Liou, 1984: 147.

**FOURMIGUE A, LA** 424 Map 5 France

43° 32' N. 7° 5' E. Spread on the SE. side of 'Les Basses de la Fourmigue', a rocky complex near Juan-les-Pins. Depth: 10-15 m.

Amphoras. c. 125-75 BC (?).

A well-marked cargo of Dr. 1A amphoras has been much rummaged by divers. Only one was stamped ([ ]R), though another bears the impression of an

intaglio; five varieties have been distinguished. They were stopped with corks and mortar seals, impressed with two, three, four or five blank oval marks, or with a roundel-and-bar device. Over a score of coarseware vessels and fragments, mostly jars and jugs in brown clay, were found, together with numerous fragments of black-gloss ware (Camp. A), a lamp, a lead ring and an iron nail. No remains of the ship have been reported.

Pollino, 1975; 1983: 38-40; Pomey et al., 1989: 50.

**Fourmigue B, La:** a 17th-century AD wreck (Pomey et al., 1989: 50).

**FOURMIGUE C, LA** 425 Map 5 France

43° 32' N. 7° 4' E. To N. of La Fourmigue, not far from the N. rocks of the reef; on a muddy bottom. Depth: 60 m.

Amphoras and works of art. c. 80-60 BC.

A well-preserved tumulus of amphoras was discovered in 1980 and partly salvaged by the DRASM, though much material was lost to looters. The amphoras (numbering at least 100) were mostly of form Dr. 1B, stamped on the lip **PAP** or **ANT**. Three Lam. 2 amphoras (stamped **TERE** on the lip) and two Dr. 1A amphoras probably also belonged to the cargo. The ship was carrying a fine collection of furniture and sculptural appliques, mostly belonging to one or more couches of bronze, inlaid with silver and copper; an inscription indicates Greek manufacture. There were also a ewer, a large dish, a bucket (decorated with a fine Bacchic mask), a candelabrum foot, and other pieces of bronze furniture. Other material aboard included a stone mortar and pestle (apparently of Cycladic marble), two touch-stones, a tin oil lamp, Camp. B dishes, and coarseware jugs and jars. Some wooden discs probably belonged to the ship's pump. For a comparable wreck of the same period, see Le **Grotticelle**. A date in the second half of the 1st century BC has been proposed by Braemer.

DRASM, 1983: nos 277-304; 1985: 57-9; Amar & Liou, 1984: 154; Carre & Jézégou, 1984: 134; Pollino, 1984: 35-49; Liou & Pomey, 1985: 574-6; Braemer, 1986: 149-50; Hesnard et al., 1988: 92.

**FOURMIGUES, LES** 426 Map 5 France

43° 2' N. 6° 4' E. About 700 m NW. of the rocks of Les Fourmiges, W. of Giens (site at first referred to as 'Escampabariou'). Depth: 54 m.

Amphoras. Mid 1st century AD.

A cargo of Dr. 2-4 amphoras is known only from some 50 amphoras confiscated from a diver (though the location of the wreck has now been ascertained). The amphoras are of Tarraconensian type, although no exact parallel is known; a small proportion are stamped, on the foot, **PHIL** (retro.), **LIC(?)** & **PH**, **PH** & **CRI**. There are also some graffiti on the feet.

Corsi-Sciallano & Liou, 1985: 66-70; cf. Tchernia, 1986: 137.

Fournon: see **Fos A**.

**FRASCA, LA** 427 Map 7 Italy

42° 7' N. 11° 45' E. (approx.). At 'La Frasca', N. of Civitavecchia; detailed location and depth not reported.

Pottery. Late 15th century AD.

A site near Civitavecchia, probably a wreck, has produced some late 15th-century bowls, decorated internally with a central rosette and rays, most likely made at Rome.

Gianfrotta, 1981c: 85 & fig. 60.

Freu de l'Encalladora: see **Cap de Creus**.

**FREU D'EN VALENTÓ** 428 Map 4 Spain

41° 28' N. 2° 25' E. Three miles off Vilassar de Mar. Depth: 42 m.

Amphoras. c. 50 BC-AD 25 (?).

A wreck with Pascual 1 amphoras, previously known to fishermen, has been briefly reported. Some of the amphoras are in public collections, but no details of the site are known.

Serra-Ràfols, 1961b: 253.

Information: R. Pascual.

### **Frioul Islands (France)**

A 'graveyard' was reported by Benoit (1960: 43). For two identified shipwrecks, see La **Luque A** and **Pointe Debie**.

**FRONTIGNAN** 429 Map 4 France

43° 23' N. 3° 44' E. (approx.). Near Frontignan, or off Sète; detailed location and depth not reported.

Copper ingots. Mid 1st century AD (?).

Two copper ingots survive from two lots of 23 and 7 found by divers in the area of Frontignan and Sète. Both ingots are of similar weight (86 and 90 kg), and bear on the upper surface the inscription **QIF VIII**, partly incised and partly stamped. There is no certainty that the ingots came from a wreck, or

even from the same site, but it seems likely. Similar ingots were found at **Port Vendres B**, suggesting a mid-first century date.

Laubenheimer, 1987; Maréchal, 1987b.

**FUENTERRABÍA** 430 Map 15 Spain

43° 23' N. 1° 54' W. At Cabo de Higuer, near Fuenterrabía in N. Spain.

Iron ore. c. AD 100–150 (?).

A cargo of iron ore lay as a tumulus on a sandy seabed. The heap extended 25 x 15 m, and overlay some timbers (which were not studied). Some Roman pottery was found among the pieces of ore, and one item believed to be from the wreck is a terra sigillata Hispanica cup of the 2nd century AD. The ore, of high quality, was probably of local origin.

The area sheltered by Cabo de Higuer is an anchorage, and other ancient material has been found there; this appears to be the only wreck site.

Martín-Bueno & Rodríguez, 1975; Martín-Bueno, 1981; Benito & Emparán, 1987.

### **Gabicce (Italy)**

Architectural remains seen off Gabicce beach, near Pesaro, some years ago could represent a wreck, but the published information is uncertain.

Profumo, 1986: 40.

Gabiretto: see **Galbucina**

**GAYDOUROMANDHRA** 431 Map 13 Greece

37° 41' N. 24° 3' E. S. of Laurion, Attica; 50 m from a rocky coast. Depth: 5–7 m.

Amphoras. Late 5th century BC.

A cargo of Greek amphoras of unspecified type lies concreted to a reef in shallow water. Further study has altered the date first published.

Papathanassopoulos, 1980.

Information: E. Hadjidaki (via G. Kapitán).

**GALBUCINA** 432 Map 7 Italy

42° 23' N. 10° 53' E. At the NE. point of Giglio; also known as Il Gabiretto.  
Depth: 60 m.

Amphoras. c. 550-450 BC (?).

A complete Etruscan amphora and fragments of others (including some of Punic or Ibero-Punic type) were found in 1983; if there are any other remains, they are buried deep in sand. This may be the same as a site mentioned many years before by a visiting diver, who reported 'an amphora wreck at 200 feet'.

Bound & Yellowlees, 1984; Bound, 1988c: 192-3.

Information: M.A. Haigh; J. du Plat Taylor.

See also **Punta del Morto**, and sv. Giglio for a list of wrecks on Giglio.

Galilee: see **Ginosar**.

**GALLI** 433 Map 9 Italy

40° 34' N. 14° 25' E. At the Galli islands, near Amalfi (Salerno); 300 m from Vivaro rock. Depth: 40-45 m.

Amphoras. Roman period.

No details have been reported of an amphora wreck at the Galli islands. Amphora finds from the Amalfi coast are mostly Roman Imperial (including Afr. 1 & 2), but none has been attributed to this site.

Romito, 1989.

**GALLINARIA** 434 Map 7 Italy

44° 1' N. 8° 13' E. At Gallinaria island, near Albenga; 170 m off the island.  
Depth: 20 m.

Amphoras. 5th century BC (?).

Altogether five amphoras, of Massiliot type, were found in an area of sandy bottom less than 5 m square in surveys by N. Lamboglia. A bronze finger-ring was also found at the same spot. Lamboglia rightly concluded that there probably was a wreck at this site, even though the evidence was scanty, and that further excavation might reveal more. No other wrecks were found in repeated searches around the island.

Another wreck, with t.s. chiara A, appears to be referred to by Gianfrotta & Pomey (1981: 179), but without corroborative detail.

Lamboglia, 1973; Pallarés, 1983h.

Four amphoras of Corinthian B type, datable to the 2nd half of the 5th century BC, in Gallipoli Museum, came from the sea. Unfortunately, there is apparently no evidence of their provenance or association, although they certainly might all belong to a single cargo.

Desy, 1983: 176-7 & pl. II.1-4.

See also **Secche di Ugento**.

**GANDOLFO** 435 Map 2 Spain

36° 41' N. 2° 47' W. The 'Pecio Gandolfo', near Punta Entinas (Almería); in sand, close to shore. Depth: 10 m.

Amphoras. c. AD 90-110.

A cargo of Baetican fish-sauce amphoras has been looted, but some of the amphoras have been published by R. Pascual. The cargo comprised Dr. 14 and Beltrán 2A amphoras; there was also one amphora of form Dr. 17. One Dr. 14 bore a painted label naming liquamen, and another amphora (of unstated form) bore one naming **COD PORT LIX VET**. Some of the Beltrán 2A amphoras are closely paralleled at **Tiboulen de Maïre**, a site datable c. AD 100.

Pascual, 1973; Liou, 1987a: 69.

Garonne: see **Bordeaux**.

**GAROUPE A, LA** 436 Map 5 France

43° 33' N. 7° 9' E. At the E. point of La Garoupe headland, Antibes; SE. of a hidden reef. Depth: 6-12 m.

Amphoras and dolia. c. AD 10-35 (?).

Only material salvaged from a looted wreck has been published. The cargo, spread over an area of 100 m<sup>2</sup>, consisted partly of dolia, of two sizes (1.0 m and 1.65 m high); it is not known how many were originally present, but there were at least ten, and the larger type were more numerous - as at the comparable site of **Diano Marina**. At La Garoupe, the dolia (fitted with terracotta lids) bore stamps of **C. PIRANVS CERDO** (also, **FELIX** and **SOTERICVS**), members of the well-known firm. There was also a consignment of Dr. 2-4 amphoras, of which some at least were probably of Campanian origin. It is thought from their distribution on the site that the amphoras had been loaded above the dolia.

Unfortunately, no dating evidence has been reported. A mortarium, a lead bowl, and some lead piping came from the site.

Fiori, 1972a; Pollino, 1983: 33-4; Corsi-Sciallano & Liou, 1985: 173; Hesnard et al., 1988: 15.

**GAROUPE B, LA** 437 Map 5 France



43 34' N. 7 8' E. Near the coast, in the same area as wreck A. Depth: 6-8 m.

Amphoras. c. 100-25 BC (?).

A cargo of Dr. 1B amphoras lay beneath a layer of sea-grass  $1\frac{1}{2}$  m thick. The amphoras, of a rather unusual variety, have stamps on the lip, not lettered, but signs - eg. a saltire, an anchor.

Tchernia, 1969: 467-8.

**GAROUPE C, LA** 438 Map 5 France

43° 34' N. 7° 8' E. Close to wreck B. Depth: shallow.

Amphoras. c. AD 140-200.

Several Dr. 20 amphoras found together at La Garoupe are all that is known of this wreck. The amphoras are stamped (**CERARA** and **GFSCVFM**), thus helping provide the date.

Tchernia, 1969: 468.

**GAVETTI** 439 Map 6 France

41° 24' N. 9° 15' E. North of Gavetti rocks, in the Strait of Bonifacio (Corsica). Depth: 18 m.

Lead ingots. 1st century BC (?).

Nine lead ingots were found together, but in what is described as a mixed context. They are of late Republican form, possibly Spanish, with marks in three cartouches; one, marked **SOC**, is lost, and the surviving eight retain no trace of their inscriptions.

Benoit, 1960: 54-6; Bebko, 1971: fig. 296; Laubenheimer-Leenhardt, 1973: 96-112.

**GÁVRION** 440 Map 13 Greece

37° 54' N. 24° 44' E. In a bay W. of Gávrion (Andros); on a terraced slope. Depth: 7-20 m.

Amphoras. 5th-3rd centuries BC ?

'A field of amphoras from a sunken wreck, c. 30 m long' has been briefly reported. The amphoras included one of Phoenician type.

Bouzek, 1982: 137.

**GELA** 441 Map 11 Italy

37° 2' N. 14° 16' E. SE. of Gela (Sicily); 500 m from the coast. Depth: 5 m.

Cargo: uncertain.

Late 6th-early 5th century BC.

An archaic Greek wreck, recently discovered, is being excavated by A. Freschi. The hull was thickly covered with some 6-7 tons of ballast stones (including granites, lavas, limestones and marble), laid on matting, and a layer of dark, clean sand, which must also have been ballast, perhaps originally in bags. Remnants of cargo include amphoras of Ionian type, and some Corinthian A & B, Attic and Punic amphoras; there are also unpainted jugs, said to be of Rhodian type. Also the remains of luxury goods being carried as cargo are Black Figure kylikes and Red Figure askoi and oinochoe, black gloss cups, flasks and plates, a clay figurine of a boar and the wooden arm of a small statue. Seven baskets of vegetable fibre, with a wooden rim, also may have been part of the cargo. Three Ionian B2 cups can be dated to the final years of the 6th century BC. Four small painted altars, a bronze tripod and two clay weights could all have been in use on board. The hull was of stitched construction; oblique holes in the planks were plugged with small treenails, and fabric was placed between the stitches and the wood. The hull was pitched internally, and copper and iron nails were used to fasten the planking to frames. There was a keelson, rebated to fit on the frames, which ran the whole length of the hull, except at the forward part, where there was a substantial mast step. The ship appears to have been about 20 m long overall, with a flat central section and rather bluff bows.

Panvini, 1991: 197-200; Freschi, 1991.

Gelidonya: see **Cape Gelidonya**.

#### **GENOA (PEGLI)**

442

Map 7

Italy

44° 23' N. 8° 56' E. At Pegli, a suburb of Genoa (Genova); close to shore. Depth: 5 m.

Amphoras and pottery.

c. 130-110 BC.

A scattered wreck contained black-gloss pottery (Camp. A), some still stacked in piles, datable c. 120 BC. A dozen amphoras of form Dr. 1A were recovered, and doubtless belong to the same shipwreck. It was also reported that three Dr. 2-4 amphoras (profiles published) came from the site; if this were correct, it would be the only evidence for a date earlier than the mid first century BC for the occurrence of such amphoras in the West. Given the relatively early date of this discovery and the position of the site, one may discount this anomalous association and suppose either a mistaken report or some form of contamination. The only non-cargo item found was a lead ring.

Lamboglia, 1952b; Morel, 1981: 64.

#### **Getaria (Spain)**

Following a chance discovery by divers, a thorough search of the sandy bottom of Getaria bay (Guipuzcoa) produced a number of rather small copper ingots. Most were bun-shaped, others cylindrical; several bore stamps, but these

have not been published. Presumably the remains of a wreck, the date of the in-gots remains uncertain.

Anon., 1989: 75-6 & 116.

**Giannutri:** see **Cala Scirocco** and **Punta Scaletta**. Several wrecks of unspecified date are also mentioned by McKee (1968: 177-8) and Lamboglia (1964b: 231).

**GIARDINI** 443 Map 11 Italy

37° 49' N. 15° 17' E. Off Giardini railway station, 500 m S. of Capo Taormina (Sicily); on a slightly shelving, sandy bottom. Depth: 24 m.

Marble columns and blocks. 3rd century AD.

A sonar survey picked up the outline of a marble wreck, protruding from the smooth, sandy seabed. Subsequent investigation under water by Aquarius recorded a cargo of 24 columns and 13 rectangular blocks, covering an area 17 x 5-6 m. The weight is estimated at 95 tons. The columns are of Cipollino marble from Carystos in Euboea; the blocks are of a white marble, veined with grey, which is of Aegean type but cannot be identified to a specific source. Both kinds of stone were loaded aboard at a single time, forming two levels of cargo inside the hull. Finds definitely associated with the wreck comprise a mortarium and the necks of two Mauretanian (Tubusuctu) amphoras, datable in the 3rd century AD. A bronze boss with a ring, a bronze hinge and nails of copper and bronze represent fittings or furnishings of the ship, but no hull remains have been found.

Basile, 1988.

**GIBRALTAR A, B & C** 444-446 Map 2 Gibraltar

36° 6' N. 5° 21' W. Detailed location and depth not reported.

Cargo not reported. A & B: Roman; C: Byzantine.

Only summary news is available of three wrecks recently surveyed off Gibraltar.

Unpublished.

Information: G. Kapitän.

**GIBRALTAR STRAIT** 447 Map 2 -

35° 58' N. 5° 30' W. In the Strait of Gibraltar. Depth: 400 m.

Amphoras. 1st century AD (?).

A well-preserved wreck of South Spanish amphoras, lying in deep water, was photographed in the early 1960s by the exploration vessel Amalthée. The amphoras appear to be all of Dr. 9 form. Nothing was raised.

At this wreck, in contrast with some other deep-water sites, the amphoras lie close together, albeit at various angles. All the amphoras in the published photo are complete.

Bascom, 1976: pl. 4.

**GIENS A** 448 Map 5 France

43° 1' N. 6° 7' E. (approx.). Off the Giens peninsula; detailed location and depth not reported.

Amphoras and pottery. c. 250-200 BC (?).

A wreck with a cargo of black-gloss pottery has been only briefly reported. The pottery included cups and carinated dishes, decorated with rosettes or palmettes. There were also Graeco-Italic amphoras, said to have a top-shaped body (presumably Will type A); the pottery forms (Lam. 34 & 55), as described, suggest a date in the second half of the 3rd century.

Carrazé, 1972b: 129.

**GIENS B** 449 Map 5 France

43° 1' N. 6° 7' E. (approx.). Near wreck A, by implication; detailed location and depth not reported.

Pottery. 1st century AD.

A wreck with a cargo of South Gaulish terra sigillata has been briefly reported. Bowls and plates said to be of forms Drag. 18, 27 or 35 and 32/37, and stamps read as **OF RONINI** and **NA...** were found. Unfortunately, this information is inadequate to fix a close date. One finds it hard to believe that a site of such interest could be left uninvestigated, as seems to have been the case.

Carrazé, 1972b: 129.

Giens: see also La **Tour Fondue**.

**GIGLIO** 450 Map 7 Italy

42° 19' N. 10° 53' E. (?). At an unspecified location on Giglio island, described as 'a very remote site'. Depth: 18 m.

Pottery. 13th-14th centuries AD (?).

Little has been reported about this relatively coherent wreck. A small jar of later medieval type is among unpublished finds.

McKee, 1968: 116-7.

Information: R. Hale.

**GIGLIO CAMPESE A**

451

Map 7

Italy

42° 22' N. 10° 52' E. The 'Etruscan Wreck' of Giglio; at the foot of Le Secche, a rock not far offshore at the N. end of Campese Bay. Depth: 40-50 m.

Amphoras, pottery and other cargo.

c. 600-590 BC.

An Etruscan wreck lies in a relatively coherent state in a sandy gully at the foot of a steep, rocky slope. The Secche di Campese, now 3 m below the surface, were evidently the cause of wreck. The site was discovered by R. Vallintine in 1961 and was excavated by M. Bound in 1983-5. The cargo included Etruscan amphoras, some of which contained olive pits, and Samian amphoras (one with a monogram stamp); all the amphoras, like most of the other finds, were thickly covered with pitch, which must also have been contained in some amphoras. Cork amphora stoppers were found. There were at least two bun ingots of copper, and many small nuggets of smelted copper (perhaps for use as currency). Lead ingots, too, were found; originally there were many on board, though only three have survived. They are oval, of lentoid section, and marked with V and two other signs; they might have originated on Giglio itself. South Etruscan kantharoi (cups) in bucchero nero were found in substantial number, and must have been part of the cargo; there were also some Etruscan painted aryballoi (oil-flasks). Other finds which might have been cargo include Punic amphoras and Early Corinthian painted pottery, notably aryballoi by the Jewel Painter. A few pieces of cut amber may be the remnants of a once substantial consignment. A group of anchor-stocks, all apparently unused, and one half-finished, are of a type of granite found on Giglio, and must represent, if not cargo, a new supply for the ship, loaded just before she sank. Another stone stock, however, of different stone, was chipped, and must already have been in use on board.

Shipboard items included a Laconian tankard, an 'Ionian' bowl, and various lamps; there were also iron concretions (as yet unidentified), many fishing weights of different shapes, for both line and net, and (apparently) some steelyard weights. More unusual finds were a writing tablet (originally covered with wax) and a stylus, a carved wooden box-lid, the remains of several oboe-like wind instruments (auloi), and a carpenter's mortice gauge. There were also some arrow-heads, and a magnificent bronze helmet of Corinthian type, decorated with incised designs including a boar on the right cheek-piece. Part of the hull survives, covered by the pitch deposit; both the garboards and three strakes (of pine) on one side are preserved, together with the keel. The stitches used to assemble the hull were locked in place with treenails; the shipwright marked out the strakes with incised guide-lines. The ship was built of pine, fir, deciduous oak, elm and phillyrea, with treenails of olive, hazel and phillyrea, and blocks of box and evergreen oak; unfortunately, this species assemblage does not indicate any particular part of the Mediterranean region as the vessel's home port.

Taylor, 1966; McKee, 1968: 107-9; Bound & Vallintine, 1983; Rendini, P. in Martelli et al., 1982: 51; Bound, 1985a; 1985b; 1986; Abbate Feldman & Giachi, 1989.

Information: R. Vallintine; M. Bound.

**GIGLIO CAMPESE B**

452

Map 7

Italy

42° 22' N. 10° 52' E. On the same reef as wreck A; detailed location not reported. Depth: 30 m.

Amphoras. 2nd-1st centuries BC (?).

Only a summary report has been published of a late Republican wreck on the Secche del Campese. No material from the site was available to Rendini, but there were four different amphora types in the wreck, according to Zecchini.

Zecchini, 1971: 194-5; Rendini, P. in Martelli et al., 1982: 51-2.

**GIGLIO PORTO**

453

Map 7

Italy

42° 21' N. 10° 55' E. 70 m off the S. mole of the harbour of Giglio, in a muddy bottom. Depth: 36-40 m.

Amphoras and iron bars. c. AD 200-225.

A well-preserved wreck, extending 18 x 10 m, was discovered in 1978 and excavated over four seasons between 1984 and 1988 under P. Rendini. Only the after part of the ship was excavated; the site has now been closed. The cargo was made up mostly of Afr. 2A amphoras, variously stamped **LAS**, **FLP**, and **O** (or a horseshoe sign), in two layers, the lower layer resting in part on leafy branches of trimmings or tendrils. They had cork stoppers (not found in place) and were pitched inside; they were filled with clayey mud, containing many shells (type uncertain - perhaps Trivia monacha, the European cowrie). It is possible that this is some kind of mortar for building, but is perhaps more likely the remains of a preserved shell-fish product. Earlier reports said there were also Afr. 2B amphoras, but this has not been confirmed. There were also masses of hollow iron concretions, at first thought to be anchors, but more likely iron bars.

Finds from the stern area of the ship included many animal bones (some butchered), a large jug, some black-rimmed cooking ware, drinking-glasses, lamps (datable early 3rd century) and lead weights. Several amphoras present in only one or two type specimens (including a Mauretanian amphora) belonged to the ship's stores (cf. **Plemmirio B**). The hull was preserved; the ship is estimated as 30 x 8 m, 3 m in height. A surprising number of pottery tubes were found among the amphoras or lying on the planking: were they to wedge the cargo amphoras firm, a complementary cargo, or even perhaps part of a pump?

Ciabatti, 1983; 1985a; Gianfrotta, 1985b; Mocchegiani, 1986: 173; Rendini, 1991.

Information: G. Kapitän.

Giglio: see also **Cala Cupa**, **Capel Rosso**, **Castellare del Porto**, **Formiche di Grosseto**, **Galbucina**, **Punta del Fenaio**, **Punta del Morto**, **Punta Lazzaretto**, **Le Scole** and **Secca della Croce**.

**GINOSAR**

454

Map 14

Israel

32° 50' N. 35° 31' E. In L. Galilee (Kinneret), S. of Kibbutz Ginosar; revealed by low water conditions.

No cargo.

Mid 1st century AD (?).

A boat of the Roman period was excavated and raised by S. Wachsmann. The boat, which originally measured 8½-9 x 2½ m, was made from a variety of wood, including some reworked pieces. The keel was of cedar and jujube, the planking mostly cedar. The planking was assembled with oak tenons, though iron nails were used to fasten the nose-end of scarf joints, and some double-clenched nails were used in the planking. There was no ceiling, but marks on the keel suggest there may have been a mast. A groove at the foot of the stempost suggests it originally had a projecting cutwater.

The boat had been stripped of useful parts, and lay among the remains of three others, indicating that the site had probably been a boatyard. A lamp probably of the 1st century BC was found inside the boat, and pottery of the period c. 50 BC-AD 70 outside; C<sub>14</sub> dates lie in the calendaric range 120 BC-AD 40. It is likely that the boat was dismantled in the years preceding AD 67, when the nearby town of Taricheae (Migdal) was taken and depopulated by the Roman army.

Wachsmann & Raveh, 1987b; Wachsmann et al., 1987; Steffy, 1987; Raban, 1988: 321; Wachsmann, 1990.

**GLARONISSI**

455

Map 13

Greece

39° 22' N. 26° 20' E. (approx.). Off Petra in NW. Lesbos; detailed location and depth not reported.

Amphoras.

Roman period.

A large number of Roman amphora fragments, probably the remains of a wreck, were found by the Greek Underwater Antiquities Department in 1984.

Touchais, 1985: 831 (from press reports).

**GOICA**

456

Map 8

Croatia

43° 10' N. 16° 24' E. Off Goica, alternatively Gojica (Pakleni islands); detailed location and depth not reported.

Amphoras.

c. 25 BC-AD 50 (?).

About 50 amphoras of form Dr. 6A are known to have come from this wreck.

Cambi, 1989: 323-4.

**GÜKOVA**

457

Map 13

Turkey

36° 58' N. 27° 38' E. On an underwater reef in Gökova (Kerme) Gulf. Depth: 10-15 m.

Amphoras. 3rd-2nd century BC.

The remains of a cargo of Rhodian amphoras, very broken and scattered, were found in an area 25 x 7 m. There were no hull remains or close dating evidence. The same reef, littered with mixed material, may hold remnants of other wrecks.

Pulak, 1988: 10.

For other wrecks in this area, see **Kerme Gulf** and **Sheytan Deresi**.

Golfe Juan: see La **Fourmigue**.

**GOLFET, EL** 458 Map 4 Spain

42° 20' N. 3° 15' E. In an inhospitable bay, N. of Cap de Creus. Depth not reported.

Amphoras. c. 100-75 BC (?).

A looted wreck of Dr. 1A and Dr. 1C amphoras has not been investigated archaeologically. The amphora cargo (described as Dr. 1B and 1C in the first publication) bears general comparison with that of **Cavalière**, but must be rather later in date. No other finds from the site have been published.

Pascual, 1966.

**GOLFO DELLA STELLA** 459 Map 7 Italy

42° 44' N. 10° 19' E. In the bay E. of Capo della Stella (Elba). Depth: 30-40 m.

Amphoras (?). Date unknown.

A wreck of uncertain date and nature has been summarily reported.

Pallarés, 1983b: 183, no. 36 (citing G. Brambilla).

**GOLO** 460 Map 6 France

42° 31' N. 9° 32' E. Found in canal-digging near the mouth of R. Golo, Corsica.

No cargo. Roman period.

An extraordinarily well-preserved boat, 14 m long, was recorded in 1777 by a local scholar. Complete with mast-step (and some ropes), hence apparently a sailing vessel, the boat was of normal mortice-and-tenon construction; however, there are some unusual details. The frames were half-round, not squared, in section, and the hull was symmetrical. The boat was decked half-way along, up to the mast, which was placed centrally. No nails were used in the construction.



The boat therefore shows some peculiarities, relative to sea-going ships of the period, as one might expect in what must have been a coasting or lagoon vessel; for stronger regional variations elsewhere, cf. **Valle Ponti**. Unfortunately, no dating evidence for the Golo boat is known to exist.

Basch, 1973.

**GORGONA A**                                    **461**                                    Map 7                                    Italy

43° 24' N. 9° 54' E. At the S. point of Gorgona (Tuscan Islands); between Cala dei Giunchi and Punta di Cala Scirocco. Depth: 55 m.

Amphoras.                                    1st century AD (?).

A wreck with Roman amphoras, apparently of Dr. 7-11 and Beltrán 2A forms, was once well-preserved but has been looted. Originally there are said to have been about 500 amphoras and assorted pottery on the site. Various finds from the sea off Gorgona are listed by Cocchi, but there is no mention of any shipwreck.

Zecchini, 1971: 52-4 & 197; Di Sant'Ignazio, 1975; cf. Cocchi, D. in Martelli et al., 1982: 56.

**GORGONA B**                                    **462**                                    Map 7                                    Italy

43° 24' N. 9° 54' E. Detailed location and depth not reported.

Another, deeper wreck off Gorgona, at Punta di Cala Scirocco, has been summarily reported, without details of cargo or date.

Zecchini, 1971: 54.

#### **Gorgona: other sites**

Two sites to E. and NE. of Gorgona which have produced Roman material are noted, but without any detail, by Di Sant'Ignazio (1975).

**GOSPA PRIZIDNICA**                                    **463**                                    Map 8                                    Croatia

43° 29' N. 16° 21' E. On the S. coast of Čiovo island. Depth not reported.

Amphoras.                                    Mid 1st century BC.

A cargo of Lam. 2 amphoras, datable to the mid 1st century BC, has been badly looted. Only one amphora stamp, **NIC**, is known from the site.

Vrsalović, 1974: 53 & 240; Cambi, 1989: 315-6.

Gozo: see **Xlendi**.

**GRADO**

464

Map 8

Italy

45° 43' N. 13° 20' E. (approx.). Six miles from Grado (near Aquileia); on a sandy bottom. Depth: 15 m.

Amphoras, glass and other goods. c. AD 200 (?).

A wreck found several km off-shore near Grado is being excavated by E. Tortorici. The cargo comprised amphoras of at least four types, including Afr. 1 and what appears from a published photo to be Kapitän 1 form; the central part of the ship was filled with Afr. 2A amphoras, and forward of these were Tripolitanian amphoras; fore and aft were further consignments, including horn-handled amphoras and bag-shaped jars of uncertain affiliation. A series of bronze stands with lions' paws and acanthus decoration were probably also cargo. The ship contained a large quantity of glass; much of this was waste glass, packed in a barrel which had disintegrated, and it included fragments of several square bottles with the basal mark **C SALVI GRATI** (C. Salvius Gratus, active probably at Aquileia in the mid-late 2nd century). It is not clear whether there were also complete (newly made) glass vessels on board. Shipboard items found include a bronze figurine of Neptune, pottery, a bronze steelyard-weight in the form of Minerva and a conical sounding-lead. The ship is reckoned to have extended 18 x 5 m; it was lead sheathed, and some of the frames are not squared off - presumably a local ship engaged in short-haul trade.

Picozzi, 1988b.

Information: J. Price; E. Tortorici.

**GRAHAM BANK A & B**

465-466

Map 11

Italy

37° 11' N. 12° 41' E. and 37° 8' N. 12° 45' E. In the area of a shoal, a volcanic island which broke surface for six months in 1831. Depth not reported.

A. Amphoras of form Dr. 1A. c. 150-100 BC (?).

B. Late Roman cylindrical amphoras.  
c. AD 375-450 (?).

Of a number of sites in the Sicilian Channel known to fishermen, two are very probably shipwrecks, though no details of any finds other than amphoras have been reported. A close parallel for the amphoras of wreck B has not been found, but cf. Keay 32.

Other sites which probably represent wrecks, but are too poorly reported to list in this catalogue, are at 40 m deep SW. of Capo S. Marco (near Sciacca), where finds include Punic amphoras, and in unknown depth, 6 miles off Mazara del Vallo, type of material not known.

Chiappisi, 1968.

**GRAND AVIS, LE**

467

Map 5

France

43° 1' N. 6° 27' E. In the Baie du Grand Avis, Île du Levant. Depth: 10 m.

Amphoras and pottery. c. 100-75 BC (?).

A preliminary survey of the site revealed a cargo of Dr. 1B amphoras and black-gloss pottery (Camp. B). The precise location has not been reported; some South Gaulish terra sigillata was brought up from the same spot, but whether this represents a second wreck has apparently not been established. Some of the amphoras have finger-tip impressions on the neck, evidently a potter's signature; they resemble one dated 90 BC, which suggests an early 1st century date for the wreck.

Tchernia, 1969: 473-4; Carrazé, 1976a: 69 & 71 (with correction to the previous report); Miró, 1986.

#### GRAND BASSIN A

468

Map 4

France

43° 6' N. 3° 7' E. At Gruissan (Solier et al., fig. 6, point 3); found in dredging an ancient lagoon to create a new pleasure harbour. Depth: 2½-4 m.

Amphoras and pottery. c. 350-250 BC (?).

Only material collected from a dredger dump is known of this probable wreck. The pottery comprises Siceliot red-figure bowls and a cup, an Attic cup, and early Ionian black-gloss pottery, all datable in the second half of the 4th century; there are also two 'imitation Campanian' cups of the Nikias-Ion Group (made in NE. Spain), not thought to be datable earlier than c. 250 BC. There are two Massiliot amphoras and fragments of several amphoras of Punic form (Mañá Type B; probably from NE. Spain). Although the chronological spread seems too wide for all this material to belong to one wreck, the fact that it all came from a restricted area strongly suggests that a wreck of the period existed, even if its contents cannot be definitely identified. It is hoped that more remains of this and the other Grand Bassin wrecks survive, below the rather shallow depth excavated by the dredger.

Solier et al., 1981: 53-9.

#### GRAND BASSIN B

469

Map 4

France

43° 6' N. 3° 6' E. At Gruissan, found in dredging (Solier et al., fig. 6, point 4). Depth: 2½-4 m.

Amphoras and pottery. c. 110-90 BC (?).

Material found in two dredger dumps could be traced to a single area, and forms an interesting group. The cargo was mostly made up of Dr. 1A amphoras, pitched inside; one was stamped with an intaglio bearing the sign of a nude flautist and the letters C.C.L. Grape pips were found in one amphora. A few fragments of amphoras of other forms were found, but not all of these can be associated. The quantity of pottery recovered suggests that this, too, was cargo. The recorded vessels are 31 items of black-gloss ware (Camp. A and B, of Italian origin), 25 pieces of grey ware, and 90 of coarseware. Many shipboard items had Spanish connections: these included a bronze dish, inscribed in Iberian ba likum steniotes ke rita (phrase including a name), a fragment of a

'sombbrero de copa', and four coins of Cese (Tarraco). Other shipboard items included a bronze bracelet, a pitcher, two cups, a situla, a ladle, a portable storm-lantern, and the remains of two helmets of Italo-Celtic type. There was also a piece of lead pipe.

The Spanish affinities of the ship, whose cargo was certainly Italian, provide an interesting comparison with the contemporary wrecks of **Cavalière** and **Colônia de Sant Jordi A.**

Solier et al., 1981: 59-85.

**GRAND BASSIN C**

**470**

Map 4

France

43° 6' N. 3° 6' E. At Gruissan, found in dredging (Solier et al., fig. 6, point 5). Depth: 2½-4 m.

Mortaria and lamps.

c. AD 120.

Only material, gathered from dredger dumps, is known from what must have been a well-preserved and important site. Part of the cargo consisted of mortaria (only fragments were recovered), of two types. The first type, of greyish clay, bore the following stamps: **Q.OPPI VERECVND, RESTITVTVS Q.OPPIVS F, Q.OPPI.IVSTI CANDIDVS**, the same + **D(OMITIA) P((VBLI) F(ILIA) L(VCILLA)**, and a floral ornament without letters. The second type, beige to pink in colour, was stamped [ **JAVTRONIVS LVCIFER FEC.** Both types were made in Rome, probably at the very beginning of Hadrian's reign (M. Steinby, pers. comm.).

The cargo also included many lamps: 2,301 were counted, but this was only part of the number originally on board. Of two sizes, and several varieties, they include lamps decorated with animals, scenes of daily life, and allegorical figures, as well as branches, palmettes, gadroons, etc.; curiously, there are none with the popular gladiatorial scenes. One is signed **L.M.ADIEC**; the factory of the L. Munatius family was in central Italy, and it is probable that all the stamps came from the same factory.

Other finds from the site include a stone mortarium, a coarseware jar, and a fine-wall beaker. Pieces of the ship were also dumped in the dredger spoil. The wood had been well preserved by the rapid deposition of alluvium, which had sealed it off from the salt water. The planking was carefully made, apparently from cedar and oak, and assembled with oak tenons, pegged with olive-wood tree-nails. Pieces of the keel, the mast-step or keelson, and a wale were found; the keel was bolted to a floor by a copper bolt whose head was covered in hard pitch for protection. The frames were fastened to the planking with tree-nails of olive, fir and palm wood and copper nails. In contrast with the fine work of the planking, the frames (of oak) were not squared on the inside surfaces, and were rather irregularly spaced and fastened. The planking was sheathed in lead, applied over a layer of fabric and pitch; at one point, where the sheathing had come away, the hole left by a lost tack had been plugged with a tiny treenail and a new tack had been driven in to one side of the place. The dimensions of the hull fragments found suggest a large vessel.

The destruction of this interesting wreck, with its unparalleled cargo and potentially important hull, was lamentable. Here it was not the malevolence or carelessness of divers, but the impotence even of a national archaeological service in the face of modern techniques of development, that was responsible. Where, as here, or (for example) at **Valle Ponti**, a laden vessel is lost and rapidly silted up, the preservation of both cargo and ship may well surpass that of even the best-preserved open-sea wrecks; finding and protecting silted sites is thus a major responsibility which must increasingly be faced by countries bordering on the Mediterranean.

Liou, 1973: 575-6; Cairou, 1974; Solier et al., 1981: 85-114.

**GRAND BASSIN D**

471

Map 4

France

43° 6' N. 3° 7' E. At Gruissan, found in dredging (Solier et al., fig. 6, point 6). Depth: 3-4 m.

No cargo (?).

AD 313.

Material from a dredger dump comprised about 200 copper nails (including sheathing-tacks), a few amphora sherds, and a hoard of 4,000 coins. The coins are all of bronze, from 14 mints, mainly Rome and Ostia, and end in AD 313. Although no remains of a ship or its cargo were found, the Italian nature of the hoard, and its apparent association with a collection of ship's carpenter's nails, strongly suggests a wreck.

Solier et al., 1981: 114-75.

**GRAND CONGLOUÉ A, LE**

472

Map 5

France

43° 10' N. 5° 24' E. At the NE. point of Le Grand Congloué islet, S. of Marseille; at the foot of a cliff. Depth: 32-45 m.

Wreck A (or 1) is overlain by wreck B (or 2); this fact was denied by F. Benoit in his monograph report (1961a), and has only recently been conclusively established and published by L. Long (1987a).

Amphoras and pottery.

c. 210-180 BC.

The lower part of the archaeological deposit at Le Grand Congloué is a wreck with Graeco-Italic amphoras and Camp. A pottery; it is overlain by a cargo of Dr. 1A amphoras (wreck B, see below). The excavation of the Grand Congloué site was undertaken partly as a technical exercise by J-Y. Cousteau in 1952-7; it was the first major project to use aqualung divers on an ancient shipwreck. The nature of the site, and the method of work, have been frequently described (cf. Taylor (1965) and Bass (1966), with references). The depth, the situation and the poor water conditions made work difficult; the divers were not properly supervised, and often played tricks on Benoit (the archaeological director) and other archaeologists. No systematic record was made of underwater locations and stratigraphy, though the excavation diaries contained enough information for Long to reconstruct the main facts about the site. From the first, it was clear to archaeologists that the datable material fell into two groups, roughly a century apart, and that the Dr. 1A amphoras - superimposed, as several of the divers and Benoit admitted, over the Graeco-Italic ones - must belong to a later wreck. However, the divers came to see these arguments as attacks on their integrity, and they answered them by making irrational, incorrect accusations of personal malice and petitio principii against the archaeologists (eg. Dumas, 1972: 107). No doubt this influenced Benoit when he asserted in his report that the material was of a single period and that there was no evidence for two ships at the site. More recent investigations show conclusively not only that the Graeco-Italic and Dr. 1A amphoras lie in different parts of the site, but that there are some timbers of both the ships' hulls, on slightly different alignments.

The cargo of the lower wreck consisted mostly of over 400 Graeco-Italic amphoras of two sizes, some stamped **TI.Q.IVVENTI**, and about 7,000 pieces of



island and the mainland, she struck the *Écueil du Milieu*, a barely visible reef level with the surface. The main cargo was of ovoid amphoras, generally similar to amphoras in the **Palamós** wreck. There was also a smaller number of taller, more slender amphoras, resembling Dr. 1C (and thought by Carrazé to be Italian) but in fact probably an early variety of Dr. 12 (or even Dr. 16); they are of the same clay as the ovoid amphoras, and share some technical details. All the amphoras were lined with a brownish coating. Two ovoid amphoras, raised by a looter, had grape pips in the bottom, and these must be part of the original contents. The amphora from **Cádiz B** which likewise produced grape pips is also ovoid, though it is not precisely similar to either of the two published from Grand Congloué C. On the other hand, the ovoid amphoras (much more similar) from **Planier E** contained fish remains.

It seems that these amphoras date from the early period of Spanish exports, before the greater standardisation of amphoras which took place under Augustus (cf. Hesnard, 1980; also **Cabrera D**); different cargoes could be transported in amphoras which included ovoid amphoras of many varieties.

Tchernia, 1969: 483-4; Sortais, 1970; Carrazé, 1970f; Colls *et al.*, 1977: 89; DRASM, 1985: 103, no. 445.

Information: I. Sortais.

**GRAND RADEAU, LE**                                        **475**                                        Map 4                                        France

43° 27' N. 4° 21' E. On the beach of Le Grand Radeau, S. and SE. of L'Étang d'Icard (W. of Les Saintes-Maries-de-la-Mer).

Amphoras.                                        c. 45-35 BC (?).

A number of Dr. 1 amphoras, complete with seals, was found on the beach. One seal read **D[ ]VA[ ]**; on the lip of one amphora was the stamp **SACAFI**. A denarius of Cn. Pompeius, datable 46-45 BC, was found at the site. Another find was a coarseware dish, said to be stamped **EVT MARI**.

Gallia, 11 (1953): 111; 12 (1954): 432.

**GRAND RIBAUD A, LE**                                        **476**                                        Map 5                                        France

43° 1' N. 6° 8' E. Near Le Grand Ribaud islet (between Porquerolles and Giens); by a reef, 200 m SE. of the lighthouse. Depth: 15-20 m.

Amphoras.                                        c. 120-100 BC (?).

A widely-spread wreck of Dr. 1A and 1C amphoras was excavated by F. Carrazé. The amphoras were lined with pitch and stopped with a cork and a mortar seal; surviving seals (on Dr. 1A amphoras) were stamped **M.LVCTM**, and one amphora was stamped **AI** or **AT**. There is no evidence for the contents, and wine seems likely. Though Dr. 1C amphoras were made in Etruria, the Grand Ribaud A examples contain biotite, unlike the hornblende which characterizes many Dr. 1 amphoras of probable Etruscan origin.

A single ovoid amphora was found in the wreck, and there were also a black-gloss cup, two pieces of tile, pieces of a rotary hand-mill, an axe, an adze, a hoe, possibly an iron anchor, and a lead anchor-stock. Part of a jawbone,

possibly pig, reminds one of the comparable wreck of **Cavalière**; a piece of bluish glass, said to be blown, is perhaps an intrusion, like a Gaulish pear-shaped amphora neck. Only fragments of the ship were preserved; none showed any trace of metal nails, and in general the half-frames and floors resembled those of the **Titan** wreck.

The date of the wreck, c. 130 BC according to Carrazé, should probably be closer to that of **Cavalière**, c. 100 BC.

Carrazé, 1975; Empereur, 1983.

### **Grand Ribaud anchorage ('site B')**

A site near **Grand Ribaud A** wreck, designated site B, is an anchorage; while it produced a good deal of similar material, there is no evidence for a wreck.

Carrazé, 1974c; Liou, 1975: 590.

### **GRAND RIBAUD D, LE**

477

Map 5

France

43° 1' N. 6° 8' E. At the foot of drop-offs on the NW. point of the islet of Le Grand Ribaud. Depth: 19 m. (Nothing has been published of an implied wreck C).

Amphoras and dolia.

c. 10-1 BC.

A badly broken-up wreck was excavated by A. Hesnard in 1983-4; the site was carefully sampled, but not completely dug. The ship had carried eleven large dolia, which, when full, would have weighed more than two tons, and had been installed amidships; stamps on them included **TERTI.PAPI**, **APOLLONIVS** | **M.CALICI PRIMI.S.F.**, **C.PIRANVS** | **SOTERICVSF**, **MAHE** | **FECIT** + phallus, and **HELVIVS** | **MAHESFE**. Two had a graffito indicating the volume of their contents. There were also about 200 Dr. 2-4 amphoras, originating from the Naples area; some were stamped, on the handle, **M.LIVI.CAVSOR(I)**, **L.EVMACHI**, **[L]ICCA(EI)** and **M.RVP(I)**. A further consignment of Dr. 2-4 amphoras (in number approx. 26), some of which were stamped, originated in the Adriatic regions of Italy. Other amphoras, not thought to belong to the cargo, comprised seven Dr. 2-4 and three Pascual 1 from Tarraconensis, two Coan amphoras and two Dr. 9 from Baetica; these last were found at one end of the site, probably the stern. The ship, in sinking, had turned over, trapping packing-timbers, bulkheads and part of the deck (assembled with treenail-fastened mortice and tenon joints, and lined with fabric) between the dolia and the rocky seabed. Other remains of the ship included several blocks, sail-rings, a wooden bearing (?) and another rigging fitting. The vanished bottom and sides were fastened with iron nails, unusually for a ship of this date; there was no evidence for lead sheathing. An iron grapnel, some lead pipes from the pump and a lead jar were found. Other ship-board items included a knife, a balance-pan, a lamp, fishing-weights, an adze-head and a small stone plaque, identified as a touch-stone. Pottery, comprising black-gloss, pre-Arretine, Arretine, fine-wall and coarse ware, dates the wreck to the last decade of the 1st century BC. A careful study of the fragments found suggests that there was provision on board for a complement of six, of whom Pap(us), Ma[...] and/or Mar(ius), Sex. R[...] and one marked his cup with a square sign, are known from their graffiti on Arretine plates and cups.

A detailed analysis of the site and the finds has established that the ship was probably of normal shape, even though the dolia had been installed amidships; the actual number of cargo amphoras found fits with a calculated capacity



of around 250 amphoras in addition to the dolia. The ship will have been some 18 m long, with a capacity of 45-50 tons burden. The stamps on the dolia indicate a link with Minturnae in southern Latium. The fragments of the ship's structure found were of a variety of wood including deciduous oak, alder and willow; these are consistent with an origin in the Minturnae area, but the use of such an unsuitable wood species as willow (and oak (for a ceiling plank), presumably an offcut) suggests a shortage of wood, perhaps due to deforestation.

Hesnard *et al.*, 1988. See also DRASM, 1985: 79-80; Corsi-Sciallano & Liou, 1985: 173; Gianfrotta & Hesnard, 1987.

**GRAND ROUVEAU, LE** 478 Map 5 France

43° 4' N. 5° 45' E. Close to Les Magnons, W. of Le Grand Rouveau. Depth: 35 m.

Amphoras. Mid 1st century AD.

A cargo of Dr. 2-4 amphoras (found in 1975) extended over an area 15 x 8 m. The amphoras are of Tarraconensian type; almost half are stamped (on the foot) **A, ALB, AM, B, BAL, M, OA, PF, QVA, TCL** and **TRA[ ]**. The ship carried both iron and lead-stocked anchors. The concretion of an iron anchor was 3 m long (with traces of metallized deck planking). Of two lead stocks found, one was inscribed **Q FABI**. A tank, a pipe and a bronze bearing belonged to the bilge-pump. Other finds comprised a large leaden vessel with a sagged bottom, a small jug (lined with pitch), a mortarium, and two Arretine plates with makers' stamps.

Carre & Jézégou, 1984: 184; Corsi-Sciallano & Liou, 1985: 44-65.

**GRAND SOUFRE, LE** 479 Map 5 France

43° 12' N. 5° 18' E. ? Near Marseilles; detailed location and depth not reported.

Amphoras. c. 100-25 BC (?).

Only a passing reference has been published to a wreck with Dr. 1B amphoras, one stamped **PHILO** and with the sealing **PHILEMO**.

Hesnard & Gianfrotta, 1989: 422.

**GRANDE GREVILLE** 480 Map 5 France

43° 34' N. 7° 8' E. E. of Grande Grenille islet, near Antibes. Depth: 17 m.

Amphoras. c. 150-25 BC (?).

A wreck of amphoras, said to be 'like Dr. 1', lay under a thick matte of sea-grass. No other material from the deposit has been reported. Around the site there are said to be fragments of pear-shaped amphoras, and there may have been some mistake in the identification of the wreck cargo.

Clergues, 1973: 116.

**GRAVISCA**

481

Map 7

Italy

42° 13' N. 11° 42' E. 500 m N. of Gravisca (Porto Clementino); 200 m from shore. Depth: shallow.

Amphoras and iron bars. 1st century AD (?).

A concreted group of material comprised a S. Spanish amphora (Dr. 7-11) and five iron bars of average length 0.35 m. Though the site obviously represents a wreck, there must have been more material at one stage; the amphora may not have been cargo, so the supposed Spanish origin of the iron is far from certain.

Gianfrotta, 1981c: 83 & fig. 55.

**Gravisca: other wrecks**

Two other ships found in the Roman harbour are probably post-medieval.

Shuey, 1981: 43-5.

**GRAZEL A**

482

Map 4

France

43° 6' N. 3° 6' E. At Gruissan; in a sanded-up channel, the 'Grazel' (Solier et al., fig. 6, point 1).

Amphoras. c. 200-150 BC (?).

On several occasions, dredging revealed the remains of a cargo of amphoras. The amphoras (of which only fragments have been illustrated) are clearly Graeco-Italic (pace Solier); from the same site came black-gloss pottery. A late Republican coin of Ampurias was presumably intrusive.

Liou, 1975: 576; Solier et al., 1981: 23-6 (with references).

**GRAZEL B**

483

Map 4

France

43° 6' N. 3° 6' E. In one bank of the sanded-up 'Grazel', at Gruissan.

Metal objects. c. AD 631.

A variety of metal objects, found twice in dredging operations, belong to a wreck which may still be mostly preserved in situ. Recorded finds of bronze comprise pots (with a silvered lid), a box, a strainer, a lamp, a balance pan, a steelyard, and various fittings. In all, 101 coins are known from the site, mostly of Constantinople; the latest date is AD 630-1, and a later date is numismatically unlikely. Not all the metal objects are necessarily cargo.

An excavation of this site would be of interest if only to provide a comparison with the contemporary **Yassi Ada A**.

Yché, 1907; Solier et al., 1981: 26-52.

**GREBENI**

484

Map 8

Croatia

44° 19' N. 14° 42' E. (approx.). On the Grebeni islands; detailed location and depth not reported.

Tiles. Roman period.

A wreck of roof-tiles (both tegulae and imbrices) is mentioned in a list of wrecks, without details. The published map shows several wrecks on the Grebeni islands, but this is the only one mentioned.

Brusić, 1980: 162 & 166.

**Greece: unidentified site**

At a site somewhere in Greece, an unpublished report records a wreck of Hellenistic or Roman amphoras, similar to Coan but with single handles; also two iron anchors with movable iron stocks.

Information: G. Kapitān.

**GROS MUR, LE**

485

Map 5

France

43° 1' N. 6° 15' E. At Le Gros Mur (or Mourre), Porquerolles island. Detailed location and depth not reported.

Amphoras. c. 100-25 BC (?).

A wreck with amphoras of form Dr. 1B has been summarily reported.

Carrazé, 1976b: 154 n.5 & 158.

**Grottammare (Italy)**

A vague report of a Roman wreck with ingots of different metals, said to be off Ripatransone (near Ascoli Piceno) has not been confirmed.

Profumo, 1986: 46.

**GROTTICELLE, LE**

486

Map 9

Italy

40° 47' N. 13° 26' E. On the secca of Le Grotticelle, midway between Ventotene and Santo Stefano (Pontine Islands); by a rocky ridge. Depth: 42-45 m.

Amphoras and furniture. Mid 1st century BC.

Amphoras of Dr. 1 form marked the site of a much-looted wreck. Salvage dives by the authorities succeeded in rescuing a good deal of material. There were about 400 pieces belonging to couches, bronze fittings from the legs and carved bone decoration from the bed and back of the couch. The bone carvings

included female figures and animal heads. Other items included bronze fittings from chests and boxes. There were also a marble base (as for a small statue), a marble basin, a wooden marline-spike, coarseware and finewall ware. Personal possessions recovered comprise a set of surgical instruments, some coins, two bronze rings and two small wooden sandals, which could have been a child's. The date of the wreck places it alongside other Late Republican cargoes of luxury goods such as **Fourmigue C**.

Cecchini, 1980: 43 & 46; Mocchegiani, 1986: 178-9; Gianfrotta, 1986: 214-6.

See also **Cala Rossano, Punta dell'Arco & Ventotene**.

**GRŠĆICA** 487 Map 1 Croatia

42° 54' N. 16° 46' E. Near Gršćica (or Grčica), on Korcula island; detailed location and depth not reported.

Pottery. 1st-2nd centuries AD (?).

A summary reference to a cargo of 'provincial pottery' is apparently all that has been published of this wreck.

Vrsalović, 1974: 240.

Gruissan (near Agde): see **Grand Bassin, Grazel, Mateille**.

**GUARDIAS VIEJAS** 488 Map 2 Spain

36° 43' N. 2° 53' W. In San Miguel bay. Depth: 8-14 m.

Amphoras. c. AD 50-125 (?).

Several amphoras, found on a rocky bottom, appear to be the remains of a shipwreck. Amphoras of Dr. 7-11, Dr. 14 and Dr. 20 forms have been reported; it is not clear from the published illustrations what date they are, nor even if all of them can belong in a single group, though a late 1st century date seems possible. It is suggested that two conical pots found at the site might have been in use on the ship, perhaps as part of a pump, though as such they seem to be unparalleled.

Beltrán, 1970: fig. 183, nos 3-4; Pascual, 1973: 112-3.

**GUARDIS A & B, NA** 489-490 Map 3 Spain

39° 18' N. 3° 0' E. On the N. side of Na Guardis islet, Majorca; within the area also known as Colònia de Sant Jordi E. Depth: 3-7 m.

A. Amphoras and pottery. c. 150-130 BC.

B. Amphoras and oysters (?). c. AD 1-25 (?).

On the inshore side of a reef joining Na Guardis islet to the main island, excavations by D. Cerdá and V. Guerrero have revealed two wrecks, lying one on top of the other. Under a layer of sand, stones and sea-grass, 0.2 m thick, is wreck B. The main cargo was of Ebusitan amphoras, of two forms (PE-25, probably a wine amphora, distantly resembling Dr. 1, and PE-41, an externally rilled version of Dr. 7-11); there were also some amphoras of Dr. 2-4 and Pascual 1 forms. The cargo also probably included oysters, since many shells were found in the wreck. Shipboard material consisted of S. Gaulish terra sigillata bowls, fine-wall beakers, and coarseware. The lower part of the deposit is river pebbles, probably ballast, and there are some remains of the ship's hull. The Pascual 1 amphoras would normally be dated no later than c. AD 25, but some of the terra sigillata from the site appears to be later. More study of the site and of the material would resolve this difficulty.

This wreck lies on a layer of sterile sand, 0.4 m thick, beneath which is wreck A. Finds comprise Punic amphoras (Mañá types C2a and E), Italian transitional and Dr. 1A amphoras, Punic pottery, black-gloss ware (Camp. A, of several forms), and imitation Campanian ware made in Ibiza. This material can all be dated firmly in the third quarter of the 2nd century BC. No remains of the hull of wreck A have been reported.

Cerdá, 1975; 1979b; 1980: 12-13; Guerrero, 1981: 202-6 & pls XVII-XIX; 1985a; 1985b: 80-82; 1986: 186; cf. Parker, 1983; Cerdá, D. in Arribas et al., 1987: 228-30.

Information: D. Ruegg.

Guernsey: see **Little Russel** and **Saint Peter Port**.

**GÜMÜŞLÜK** 491 Map 13 Turkey

37 7' N. 27 17' E. At Gümüslük (ancient Myndus). Depth not reported.

Amphoras. 4th century AD (?).

An amphora wreck, with amphoras broadly similar to those of **Yassi Ada B**, was briefly investigated. It is not known whether any other material or remains of the ship are present at the site.

Rosloff, 1981: 281.

**GUŠTERANSKI** 492 Map 8 Croatia

43 38' N. 15 43' E. On Gušteranski island; detailed location and depth not reported.

Pottery. 1st-2nd century AD (?).

Only a brief reference has been published to a wreck with pottery similar to that at **Mljet B**, perhaps Pompeian Red ware. If Gusteranski is the small island on the E. side of Žirje, there might be some confusion with **Plavac B**.

Orlić & Jurisić, 1987c.

Guy's Hospital (London): see under **London**.

**HAGHIOKAMBOS** 493 Map 13 Greece

39° 37' N. 23° 5' E. (approx.). Off the coast of Thessaly near Haghiokambos.  
Depth: 6 m.

Cargo not reported (amphoras ?). Date not reported.

An ancient wreck, found by fishermen, has been only summarily reported.

Touchais, 1983: 785 (from a press report).

**HAHOTERIM A** 494 Map 14 Israel

32° 44' N. 34° 56' E. Near Kibbutz HaHoterim (or ha-Ḥotrim); in shallow water.

Scrap metal and ingots. 13th-12th centuries BC.

A hoard of scrap, scattered on a hard clay bottom, included bronze bits, tools, a ploughshare, reddish concretions, and fragments of copper and lead ingots. Two large stone anchors were also found, which suggests that this is in fact a shipwreck site, like **Hishuley Carmel** and **Kefar Shamir**, rather than jettison.

Wachsmann & Raveh, 1981; 1984a; cf. Pomey, 1983: 25; Raban & Galili, 1985: 329; Galili et al., 1986: 34-5.

**HAHOTERIM B** 495 Map 14 Israel

32° 44' N. 34° 56' E. Near wreck A. Depth: 2 m.

No cargo. 3rd century AD (?).

Only a summary reference has been published to the keel of a small boat, said to be of 3rd century date, which was apparently found near Kibbutz HaHoterim.

Raban, 1969-71: 63; 1973: 32.

'Haifa': see **Hishuley Carmel**.

**HALKOZ ADASI** 496 Map 13 Turkey

40° 31' N. 27° 42' E. At the NW. tip of Kapıdađı peninsula (Propontis). Depth: 15-30 m (?).

Amphoras. Late 4th-early 3rd centuries BC.

An early Hellenistic wreck was found to have been damaged by looting and dredging. Amphoras of three forms (not identified), one with a stamp, were recovered. Fragments of the ship included a wooden sheave, some rope, mortice-and-tenon joints, lead sheathing and copper tacks.

Pulak, 1985a (site 11); 1985b; 1985c (site 1).

For other wrecks in this area, see under **Marmara**.

**HARDHAM** 497 Map 15 Britain

50° 56' N. 0° 31' W. 'Hardham 2': found by the R. Arun (S. England).

No cargo. c. AD 245-345 (?).

The only British dugout dated to the Roman period is from central southern England. The original overall length was 3.89 m; the boat, which could convey one man standing and up to four kneeling, was not well suited to carrying goods and must have been for private use or a ferry. It was dated to the Roman period by C<sub>14</sub> (ad 295±50).

McGrail, 1978: 110 & 202-4.

**HAYIRSIZ ADA** 498 Map 13 Turkey

40° 38' N. 27° 27' E. At Hayirsiz Ada, off the NW. corner of Marmara island. Depth: 10-22 m.

Amphoras. 10th-11th centuries AD.

More than 100 Byzantine amphoras, of two sizes, including Günsenin type I, lay on a sandy slope. Apparently little was preserved of the hull. A medieval anchor found nearby may not be associated with the wreck.

Pulak, 1985a (site 8); 1985c (site 4); Günsenin, 1989.

**HÉLIOPOLIS A** 499 Map 5 France

43° 1' N. 6° 25' E. On the NW. side of Île du Levant, 200 m from shore. Depth: 35-38 m.

Amphoras. 4th century AD.

A wreck with a cargo of cylindrical amphoras has been re-examined by J-P. Joncheray. The amphoras (similar to those of La **Luque B**) were stopped with corks, and one contained resin. An amphora of type 'LR3' (cf. Peacock & Williams class 45) and some domestic pottery were found, as well as lead tags

like those from **Pampelonne**. The keel of the ship appears to have been repaired with re-used wood.

Lequément, 1976: 188.

Information: C. Brandon.

**HÉLIOPOLIS B** 500 Map 5 France

43° 1' N. 6° 26' E. (approx.). Said to lie off the NE. side of Île du Levant.  
Depth: 98 m.

Amphoras. c. 200-125 BC (?).

A wreck with Graeco-Italic amphoras of the 2nd century BC was seen from a research submarine in 1970.

Pomey et al., 1989: 32.

**HERCULANEUM** 501 Map 9 Italy

40° 45' N. 14° 10' E. (approx.). At the S. edge of Herculaneum excavations; 500 m from the modern coast.

No cargo. AD 79.

An upturned boat, originally 9 m long, was found on the ancient shore of the Bay of Naples at Herculaneum, deeply buried and carbonized by volcanic mud. The boat was constructed using mortice-and-tenon joints, with a marked upward flare at the exposed end (be it bow or stern). The other end and the interior have not yet been excavated.

Steffy, 1985b (superseding earlier, sometimes highly-coloured accounts).

**HERNE BAY** 502 Map 15 Britain

51° 22' N. 1° 6' E. (approx.). In the Thames estuary, SE. England; detailed location and depth unknown.

Mortaria. c. AD 55-85.

Several mortaria (at least four), with stamps of **Q.VALERIVS SE...**, have been brought up by fishermen in Herne Bay. There is no definite evidence of a wreck, but it is likely enough, given the nature of the material.

Hartley, 1977: 6.

Information: M. Redknap.

**HISHULEY CARMEL** 503 Map 14 Israel



32° 47' N. 34° 57' E. Near Kfar Shamir, 1 km S. of Haifa; not far from the beach. The site has also been described as 'near Haifa', or (wrongly) as at Dor. Depth: 3 m.

Copper and tin ingots. c. 1400 BC (?).

After a storm stripped sand off the underlying hard clay, a group of four 250 kg stone anchors was found, lying in a line less than 10 m in extent. About 50 m WSW. lay five tin ingots (weighing 2-4 kg each), of irregular shape, with what appear to be Cypro-Minoan signs on their upper surface, and one copper oxide ingot (weighing 16 kg), bearing a cast or impressed elliptical sign. No trace of the ship survived.

Maddin et al., 1977; Galili et al., 1986.

For other sites with ingots in this area, see **HaHoterim** and **Kefar Shamir**.

**HOF HACARMEL A** 504 Map 14 Israel

32° 48' N. 34° 56' E. Near Shiqmona, S. of Haifa; close to the beach of Hof HaCarmel. Depth: 2-4 m.

Amphoras (?). c. AD 160-170 (?).

A group of bronze statuettes, of Venus, Diana and the Dioscuri, found close together, appear to belong to a late Antonine wreck. Other finds, probably associated, included a steelyard and an ornamental neck-chain, as well as coins of Trajan, Hadrian, Antoninus Pius and Faustina the Younger. One amphora has been reported - there may originally have been more; it was pear- or egg-shaped, of indeterminate type. A lead anchor-stock was also found. Copper nails were found at this site and at site B.

Raban, 1969-71 (referring fig. 3 to this site, pace the text); 1973: 31.

**HOF HACARMEL B** 505 Map 14 Israel

32° 48' N. 34° 56' E. In the same area as wreck A. Depth: 2-4 m.

Amphoras. c. AD 400-425.

What was evidently a cargo of amphoras lay in shallow water south of Haifa. The amphoras have not been paralleled, but must be Byzantine; they can, therefore, be regarded as associated with a group of coins which included seven of Arcadius (AD 395-408), from the mints of Antioch and Constantinople. Apart from copper nails, which are frequent around the site, there is no evidence for this being a shipwreck, but it seems probable.

Raban, 1969-71: 67-8 ('B'); 1973: 31.

Information: M. Prausnitz.

**HORMIGAS, LAS** 506 Map 2 Spain

37° 39' N. 0° 39' W. Off Las Hormigas (or La Hormiga), NE. of Cape Palos (Murcia). Depth: 60 m.

Amphoras. c. AD 425-550.

A large cargo of late Roman cylindrical amphoras (Keay 35A) has been briefly reported.

Más, 1985a: 167-8 & fig. 8.3.

**HORNILLO, EL** 507 Map 2 Spain

37° 24' N. 1° 33' W. Close to Puerto El Hornillo, Aguilas (Murcia); site known as 'El Nido del Cuervo'. Depth not reported.

Amphoras and lead ingots. c. 80-50 BC.

Only a summary report has been published of a wreck known partly from confiscated material and partly from a survey by J. Más. The cargo comprised mostly Dr. 1C amphoras, together with some Dr. 28. There were also lead ingots, of which 15 have been recovered; of these, 13 were inscribed **Q SEI.P.F.MEN POSTVMI**. This person doubtless originated from southern Campania, and may be the man poisoned by Clodius in 58/7 BC.

Domergue & Más, 1983.

**HUELVA** 508 Map 2 Spain

37° 15' N. 6° 56' W. (approx.). Bronze hoard, dredged up near Huelva in 1923.

Bronze objects. 9th century BC (?).

The collection of bronzes includes many items of military equipment, some of them broken, and some dating from as early as the 10th century BC; most of the material originated in southern Spain, but there are a few exotic items, which may derive from foreign troops. There is no nautical material, or evidence for a shipwreck as such.

Almagro, 1958-60; Guzzo, 1969; Penhallurick, 1986: 101.

Information: R.J. Harrison.

Hydra: see **Idhra**.

Hyères islands: see **Bagaud, Grand Avis, Jaumegarde, Porquerolles, Titan**, etc.

**IASSOS** 509 Map 13 Turkey

37° 14' N. 27° 37' E. (approx.). Near ancient Iassos. Depth: 21-23 m.

Cargo ? 4th-7th centuries AD.

Only brief reports have been published of a late Roman or Byzantine wreck, located by sonar, which lies deep in mud and may have a well-preserved hull.

Bass, 1974: 337; 1975, site A (no. 7).

See also **Mandalya Gulf**.

Ibiza (Eivissa): see **Cap Negret, Conillera, Denia, Sant Antoni**.

**ÍDHRA** 510 Map 13 Greece

37° 16' N. 23° 23' E. (approx.). Off Ídhra (Hydra); detailed location and depth not reported.

Amphoras (?). 3rd-1st centuries BC (?).

Only a summary report has been published of a much-looted Hellenistic wreck off the southern end of Hydra.

Throckmorton, 1970a: 225.

**ÎLE-ROUSSE** 510 Map 6 France

42° 38' N. 8° 56' E. In the harbour of l'Île-Rousse (Corsica); off la Plage de la Gare. Depth: 3 m.

Amphoras and dolia. Mid 1st century AD.

A wreck of broken Dr. 2-4 amphoras and dolia lay in shallow water, and has been excavated in a series of salvage campaigns. The amphoras were partly of Tarraconensian type, with stamps including **AMANDI**, **FEL**, **L.C.P.**, **MI**, **MALI**, **NP**, **PF**, **P.TE** and **RVS** on the foot (cf. **Cavallo A**), and partly Gaulish (Laubenheimer G4). Several bore a pre-firing graffito. The dolia were similar to those at **La Garoupe A**; two stamps were found, **L.LICINIUS FORTUNAT.F** and **C.PIRANVS PRIMVS FE**. A cabin area produced t.s. and coarseware. Another find was a 72 kg lead ingot, marked **[.]CAESAR.AVG IMP.GERM.TFCF**, with counter-stamps and an incised numeral; this is not Spanish, and probably not British, but more likely from the Cevennes. Substantial remains of the ship's pump have been excavated, together with a lead pot. A fine bronze lamp and a bronze decorative plaque suggest that the ship must have been rather richly fitted out.

Liou, 1973: 606-8; Corsi-Sciallano & Liou, 1985: 108-118; Maréchal, 1987b; Pomey et al., 1989: 54-5; Alfonsi & Gandolfo, 1988.

Illa Portaló: see **Cala Portaló**.

Illa Redona: see Na **Redona**.

**ILOT BARTHÉLÉMY** 512 Map 5 France

43° 26' N. 6° 54' E. SE. of Îlot Barthélémy; on a flat bottom of mud and sand at the foot of a small rock formation. Depth: 55 m.

Amphoras. Late 2nd century BC.

About 30 amphoras, scattered across more than 60 m, were seen on the site, with more underneath. They were of several forms: Lam. 2, Dr. 1A (of two varieties), Dr. 1C (with stamps **LVQ**, **TN**, and **PR + SL**), ovoid amphoras as found (eg.) at **Capo Sant'Andrea B**, and one of uncertain type.

DRASM, 1985: 53-4; Liou & Pomey, 1985: 572-6.

**ILOVIK** 513 Map 8 Croatia

44° 28' N. 14° 32' E. At Sveti Patar bay to the NE. of Ilovik island (near Lošinj). Depth: 24-30 m.

Amphoras. c. AD 120 (?).

What was clearly once a splendidly-preserved wreck lay on a gentle slope in Sveti Patar bay. The amphoras were of three forms: Dr. 2-4, pear-shaped of Italian type, and a similar shape but with a rounded bottom. In fact, the necks and handles are all broadly similar, and indicate that they were made in Emilia Romagna, probably at sites including Sala Braganza and Forlimpopoli. A single horn-handled amphora presumably represents shipboard supplies. Pottery, glass, lamps with makers' marks, and a sestertius struck in AD 116, suggest that the wreck can be placed in the early part of Hadrian's reign (AD 117-138). The pottery and lamps, together with some wooden combs, were found at one end of the site, where there was also a group of tegulae and imbrices. A bronze jug and dish were also found.

Vrsalović, 1974: 53, 238-40, & figs 28, 33 & 42; Aldini, 1978: 245; Orlić, 1979; Cambi, 1989: 323-6. Amphoras probably from this site: Papò, 1965: 1079.

**IMERA** 514 Map 11 Italy

38° 0' N. 13° 47' E. Off Imera (Himera), N. Sicily; detailed location not reported. Depth: 32 m.

Amphoras. c. AD 285-350 (?).

A wreck with African amphoras (some similar to those of **Femmina Morta**) has not yet been fully reported. Coarse pottery, lamps, coins, bronze and lead objects, and a sounding lead have been found.

Purpura, 1986: 143.

Information: G. Kapitän.

**IMPERIA** 515 Map 7 Italy

43° 52' N. 8° 2' E. (approx.). Near Imperia (Liguria). Depth: unknown.

Amphoras. c. 100-25 BC (?).

Two identical Dr. 1B amphoras, found by fishermen in the 1930s, were thought by N. Lamboglia to represent a wreck.

Lamboglia, 1934-5: 133-4; 1952c: 235.

**INCE ADA** 516 Map 13 Turkey

36° 41' N. 28° 13' E. (approx.). North of Ince Ada (not located), SW. of Marmaris. Depth: 30 m.

Amphoras. 1st century AD (?).

An amphora of pseudo-Koan (Dr. 2-4) form, with fragments of some others, was all that could be found on a site reported as a wreck by a sponge diver.

Bass, 1975, site M (no. 10).

### **Ischia (Italy)**

A site which produced litharge and lead ingots, some marked **CN.ATELLI.CN.F. MISERII.I**, is not a wreck.

Capodarte et al., 1974.

**ISIS** 517 Map 1 -

38° 0' N. 11° 30' E. (approx.). Name given to the 'Jason Site', between Sicily and Sardinia; near Skerki Bank. Depth: 818 m.

Amphoras. c. AD 375-425.

A Woods Hole oceanographic survey ship, deploying the submersible Jason, discovered a coherent amphora cargo in deep water during a research cruise in the Tyrrhenian Sea; a subsequent investigation recorded the site with photos and video tapes, and raised some sample material. Preliminary information indicates that the ship carried a variety of late Roman amphoras, some cylindrical (Keay 25), some of fatter shape (cf. Keay 32), and several flat-bottomed (cf. Keay 53). A smaller jar (resembling Almagro 51A) appears to belong to the stores; other material recorded or raised includes pieces of lead and wood, both stones of a hand-mill, a lamp (datable c. AD 375-425) and a cooking-pot; the pot

contained resin, and, in it, a coin of Constantius II, c. AD 355. The site is under study by A.M. McCann, which may alter these provisional dates and attributions.

Ballard, 1990.

Information: R. Ballard; B. Robinson; A.M. McCann.

**ISKANDİL BURNU A**

**518**

Map 13

Turkey

36° 42' N. 27° 20' E. At a dangerous headland in SW. Turkey; on a sandy slope. Depth: 25-35 m.

Amphoras and pottery. Late 6th century AD.

A Byzantine wreck in medium depth has been surveyed in detail by M. Lloyd, but not excavated. The cargo consisted of wine amphoras from Palestine (Riley LR3 ('Gaza') and a ridged, tapered form), together with coarseware jugs and plates. An unusual find was a sealed casserole, perhaps a kosher cooking pot belonging to a Jewish merchant on board. Other shipboard items included a glass goblet. The ship is estimated to have been 20 x 5 m.

Lloyd, 1985.

**ISKANDİL BURNU B**

**519**

Map 13

Turkey

36° 42' N. 27° 20' E. Near Iskandil Burnu; on a rocky bottom. Depth: 8-10 m.

Amphoras. 3rd century AD (?).

Only a brief report has been published of a site with scattered Roman amphora fragments.

Bass, 1975, site J (no. 2).

**ISLA PEDROSA**

**520**

Map 4

Spain

42° 4' N. 3° 12' E. (approx.). At Cala Pedrosa, near L'Estartit (Gerona); between two submerged reefs, 300 m SE. of Isla Pedrosa. Depth: 36-40 m.

Pottery and grinding stones. c. 150-140 BC (?).

The wreck lies near the mouth of a torrent; sediment has collected in gullies in the rocky bottom, making survey and excavation difficult for the team led by F. Foerster between 1959 and 1970. Only the tiniest scraps of timber survived, and it seems likely that the ship capsized while attempting to enter Cala Pedrosa, which is protected from onshore winds by the island. The deposit was spread over an area 40 x 15 m; the excavators concluded that the mill-stones had come to rest first, followed by the pottery. Hundreds of vessels in black-gloss ware were found, sometimes still stacked in piles; 622 were catalogued, though only a dozen profiles have been published. These are of cups, plates and bowls of Campanian A ware, and can be dated (according to Morel, 1981) to the

mid 2nd century BC. Almost 200 lava mill-stones, representing 100 pairs, lay tumbled on the site and in the gullies; most were hand-mills, 0.35 m in diameter, but one pair was 0.50 m in diameter and of different shape, probably for animal drive. Of 12 stones analysed, 10 came from Olot or other local sources, but one was from Agde and one from Etna. A further item of cargo was a consignment of 'Ampuritan' grey ware; these one-handled beakers were of local origin, made in a native tradition under classical influence.

Only 15 amphoras were recovered; assuming that the site had not been extensively looted, these must represent shipboard supplies or private property rather than cargo. They are of Dr. 1A and ovoid forms; there are also various smaller containers including several wide-mouthed jars of Punic type. A complete Lam. 2 amphora and the remains of several Dr. 1B amphoras are hard to reconcile with the date of the Campanian pottery, and it may be that the attribution of these to the wreck is mistaken. Other shipboard pottery included a selection of flat dishes and lids in bright red cooking-ware, and a grey cooking-pot; a black-gloss plate had **NOSTRO** scratched under its foot. Concretions contained the remains of several iron knife-blades or the like, and a substantial iron tool resembling a jemmy.

An interesting group of 16 coins was found, together with two copper rivets which could have attached a purse to a belt, in a narrow gully full of pottery, mill-stones and amphoras (Foerster *et al.*: 119). The coins, all of bronze, comprise 2 Kaiantolos (king of the Narbonne-Beziers area), 6 Massilia, 1 Rome (uncial as), 1 Neapolis (Naples) and no fewer than 6 unidentifiable, including types which might be of Syracuse and Tarentum. The Gallic coins belong to the first half of the 1st century BC; Kaiantolos, according to some, ruled as late as the second quarter of the century, but this date is unacceptably late for the wreck. Rather than assume mistake or contamination, it seems that one must accept the archaeological dating for the coins. Although the contributors to the 1975 report agreed on a date of around 100 BC or a little later, the earlier date assigned by Morel to the pottery should be accepted, even though this leaves the homogeneity of the material recovered in some doubt.

Some copper and iron nails from the ship were found; so, too, were two round bars of lead, with traces of iron at one end, which it is thought might have been counterweights for oars. Two flat pieces of lead are the remains of a wood-encased anchor-stock, and an anchor of iron, 1.42 m long, was reconstructed from concretions. Though this anchor is of a form (with arms in a **V**) typical of a period earlier than this wreck, it is better to assume that it was old at the time of wreck or that it was made in an old-fashioned way rather than that it was not associated with the wreck.

The excavation and publication of the Isla Pedrosa shipwreck represent a substantial achievement by the Catalan divers' club CRIS, under F. Foerster; one may regret that the labour of fieldwork was not expended on a better preserved site, and that the report deals rather briefly with some of the finds.

Foerster *et al.*, 1975; Foerster, 1976: 90; Morel, 1981: 63; Roman, 1987 (with further references and discussion of the chronology); Williams-Thorpe & Thorpe, 1987.

Islas Medas (Medes): see **Medas**.

**ISLE OF WIGHT**

521

Map 15

-

50° N. 0° W. (approx.). In deep water off the Isle of Wight.

Amphoras. 1st century AD.

Several amphoras, netted by French fishermen somewhere off the the Isle of Wight, must represent a wreck. The amphoras (not correctly identified at first) are of Haltern 70 form.

Varoqueaux, 1964; Harmand, 1966.

**ISOLA DELLE CORRENTI** 522 Map 11 Italy

36° 38' N. 15° 5' E. W. of Isola delle Correnti, near the S. tip of Sicily; on the rocky lower slope of a submerged reef. Depth: 7-9 m.

Marble blocks. 3rd-4th centuries AD (?).

A cargo of marble, estimated to weigh 350 tons or more, lies grouped together in shallow water. The marble is white, with a bluish streak; it might come from Proconnesus, or else from some other quarry in Asia Minor. One fragment of a worked architectural piece was also found. No remains of the ship have been observed, except for a piece of lead sheathing. Some pottery has been found, but the only distinctive fragment is an amphora foot, retaining its rosin lining, which could well be from an Afr. 2 amphora and suggests a late Roman date.

Kapitän, 1961: 282-8.

**ISOLA DELLE FEMMINE** 523 Map 11 Italy

38° 12' N. 13° 14' E. On the E. side of Isola delle Femmine, near Palermo (Sicily); on a sandy bottom. Depth: 32 m.

Amphoras. 4th-3rd centuries BC.

One whole amphora and some fragments, described as Graeco-Italic, probably represent a wreck of the 4th or 3rd century BC.

Purpura, 1986: 144.

Isola Grande and Isola Lunga: see **Punta Scario**.

**ISOLA ROSSA** 524 Map 6 Italy

41° 1' N. 8° 52' E. At the N. point of Isola Rossa (N. Sardinia); depth not reported.

Amphoras. 2nd century AD.

A wreck was reported in 1975 at Isola Rossa; finds were an amphora rim (type not stated) and a datable t.s. chiara bowl. This may be the same wreck as one found in 1960, with many pieces of wood and amphoras; this earlier discovery



included some lead anchor-stocks, which would not normally be as late as the 2nd century AD.

Boninu, 1986: 59.

Isola di Capo Rizzuto: see **Capo Rizzuto**.

Isola Santa Maria: see **Santa Maria**.

Isole Pedagne: see Le **Pedagne**.

**ISRAEL** 525 Map 14 Israel

32° N. 34° E. (?). At an unnamed site off the coast of Israel. Depth: 40 m.

Pottery (?). 6th century AD.

A Byzantine wreck was discovered in deep water by sonar survey. A mound 2 m high consisted of ballast stones and '6th century pottery'. No further details have been published.

CMS News, 3 (October 1979).

**IST** 526 Map 8 Croatia

44° 17' N. 14° 46' E. On the NE. side of Ist island. Depth not reported.

Amphoras. 1st century BC-1st century AD.

A wreck of Lam. 2 or Dr. 6 amphoras has been summarily reported.

Brusić, 1980: 159 & 166.

**İSTANBUL** 527 Map 13 Turkey

41° 0' N. 28° 50' E. (?). 'Near Istanbul'; 1½ miles from the coast, in a soft, silty bottom. Depth: 32 m.

Amphoras and pithoi. 4th century BC (?).

A large cargo (over 24 m in extent) of Greek amphoras was found by fishermen; it is very well preserved. The amphoras may be from Chersonesos in the Crimea. Two large pithoi stood at one end of the site.

Pulak, 1985a (site 12); 1985b.

**ISTRIA**

528

Map 8

Croatia

44° 45' N. 13° 55' E. (approx.). At an unnamed site near the S. tip of Istria. Depth: ½-2 m.

Lead ingots and anchor-stocks. Greek/Roman/Byzantine period.

In 1924, very many lead bars, 0.5 m long, of 'triangular prism' form, together with many anchor stocks, were found scattered over a wide area in shallow water. The material is said to have been looted and dispersed without trace.

Nikolanci, 1961: 25.

**JARRE**

529

Map 5

France

43° 12' N. 5° 20' E. On the W. side of the N. point of l'île Jarre, SE. Marseilles bay. Depth: 48-54 m.

Amphoras. c. AD 10-50 (?).

A cargo of Dr. 20 amphoras was found, broken and scattered, off Jarre island (near **Plane**, etc.). One bore an illegible stamp. The profile suggests an early date.

Helly et al., 1986: 126-9; Pomey et al., 1989: 15-17

Jason Site: see **Isis**.

**JAUMEGARDE A, LA**

530

Map 5

France

43° 0' N. 6° 9' E. SE. of La Jaumegarde (or Jaune-Garde) light, at the W. end of Porquerolles island. Depth: 6-12 m.

Amphoras. c. 100-25 BC.

A scattered cargo of Dr. 1B amphoras was studied in detail by F. Carrazé. The amphoras were not stamped, but bore potters' signatures on rim or neck; they had been corked and sealed, with, on the seals, the stamps **Q. SATRI.M.F** and **L CARISIAN**.

There may have been more than one wreck at the site: 4th century BC Massiliot, 1st-2nd century AD Gaulish, and 1st century AD Rhodian amphoras were also found. Some of the other finds, such as coarse and fine pottery, a lead ring and an anchor-stock, a stone weight or sound and some blue glass ingots can thus not be firmly attributed to the Dr. 1B wreck. None the less, this is a good example of the information which can be won even from a poorly-preserved and much-looted site.

Carrazé, 1972a (with references); Parker, 1981b: 322-6.

43° 6' N. 6° 9' E. 550 m from the Jaumegarde light. Depth: 24 m.

Amphoras.

c. 200-140 BC (?).

A well-preserved but much looted wreck, covered with sea-grass, was partly excavated by F. Carrazé. The cargo comprised amphoras of two forms. The first kind were Graeco-Italic (Will Type E). The second kind were ovoid, and showed quite a variety of detail; no exact parallel has been found, but they may well be from Apulia, as Carrazé suggests. These ovoid amphoras were not lined, and were stoppered with a cork, sealed with mortar; they may have contained olive-oil. The Graeco-Italic amphoras were lined with pitch.

Shipboard material included a black-gloss lamp, some black-gloss pottery in various fabrics, a pot of 'Ampuritan' grey ware, and some hand-made pottery. A bronze strainer was found beneath the ceiling planks; there was also a fishing-weight, and a hand-mill. Two lead anchor-stocks have been found in the wreck; one was decorated with human faces, the other with knucklebones and dolphins. Another find was an anchor fluke-tip, shod with iron. Remnants of rigging comprised a fir toggle and a box-wood pulley.

The ship's hull had some unusual features. The surviving portion is a side, rather than the bottom; unusually, therefore, the futtocks and top timbers were found. There was no trace of a shelf or a side stringer inboard of these last timbers. The planking was very slight, only 2 cm thick; the assembly tenons were irregularly spaced, at an average 6 cm apart. The frames were fastened to the planking by oak treenails, into which iron nails were driven from outboard and their points clenched along the inboard face of the frame. Each joint was pasted with a caulking substance, which had been widely smeared over the inside of the hull; the exterior was sheathed in lead. The ship had been repaired. Two reinforcing frames of beech had been fitted by means of a sennit; this passed through both frame and planking, and the stitch-holes were plugged with small treenails. A patch of white wood had been attached under the hull (according to A. Tchernia).

The unusual cargo of this small ship, and the interesting features of the hull, make it regrettable that the site has not been completely excavated, and that the remains of the hull and the recorded finds have not been published in full (even though the brief reports by F. Carrazé are excellent as far as they go). In particular, it would be instructive to compare the hull with that of **La Chrétienne A.**

Benoit, 1960: 44-8; Tchernia, 1969: 479; Carrazé, 1972b: 127; 1973; 1974a; 1976a: 72-3, fig.6; 1977.

### **Jezirat Fara'un (Sinai)**

Byzantine amphoras found between the island of Jezirat Fara'un and the mainland (the E. coast of Sinai) are probably anchorage debris, though the suggestion that they might derive from a deeply-buried wreck has been made.

Linder & Flinder, 1968; Flinder, 1977; 1985: 55-6.

Juan-les-Pins: see **Sécanion.**

### **Kalkan (Turkey)**

Little remained at a supposed wreck site near Kalkan, with scattered sherds of amphoras including a handle said to be of the 7th century BC.

Bass, 1975, site 0 (no. 13).

**KALLITHÉA** 532 Map 13 Greece

40° 10' N. 23° 30' E. (approx.). In the area of Kallithéa Chalkidikis. Depth: 2 -3 m.

Amphoras. Byzantine period.

Four amphoras, 'probably Byzantine', found by divers no doubt represent a wreck.

Touchais, 1985: 819 (from a press report).

**KAPEL AVAZAATH** 533 Map 15 Netherlands

51° 54' N. 5° 25' E. In the R. Linge, at Kapel Avazaath (or Avezaath), near Zoelen; silted.

No cargo. c. AD 100-160 (?).

The hull of a Roman Rhine barge, comparable to those from **Zwammerdam**, etc., was dated ad 130±30 by C<sub>14</sub>. The hull was over 30 m long. Near the wreck were found an iron ring and a tool described as a caulking-iron.

Isings, 1971; Sarfatij et al., 1974: 236; Marsden, 1976: 47; Booth, 1984: 199.

**KARABAĞLA** 534 Map 13 Turkey

37° 0' N. 27° 14' E. W. of Karabağla (Karabakla) island, on the E. slope of Yassi Ada reef. The reef is the underwater extension of Yassi Ada, itself part of the same chain of islands; following Frost (1963), the name Karabağla is used to distinguish this site from the nearby, but deeper, wrecks named **Yassi Ada**. Depth: 8 m.

Amphoras. 1st century AD (?).

Rhodian amphoras were piled three deep on the shelving slope of a reef which had evidently caused the loss of several ships. A lamp was found among the amphoras. Nearby was a dense deposit of pottery, tiles, and other amphoras, whose date and association are uncertain. A second cargo of Rhodian amphoras was reported to lie further down the slope by Throckmorton, but this was not mentioned by Frost. 'At least a dozen other wrecks' lie on the reef, according to Frey (1982).

Throckmorton, 1960; Frost, 1963: 160-8; cf. Parker, 1981b: 322.

**KARACA ADASI** 535 Map 13 Turkey

36° 57' N. 28° 10' E. S. of Karaca Adasi; detailed location not reported.  
Depth: 10 m.

Amphoras and pithoi. Date unknown.

Unidentified amphoras and pithoi have been briefly reported from this wreck.

Bass, 1975, site Q (no. 5).

Karantinnaya Bay (Crimea, Ukraine)

Tiles and amphoras of different dates were found, clustered in patches in 8-14 m depth near Karantinnaya Bay (Chersonesos). These were thought at first to be wrecked cargoes, but might be anchorage debris.

Blavatsky, 1963.

**KARANTUNIĆ** 536 Map 8 Croatia

44° 0' N. 15° 14' E. On Karantunić island, at the S. tip of Ugljan. Depth: 40 m.

Amphoras. c. 150-1 BC (?).

A wreck of amphoras, no doubt of form Lam. 2, has been briefly reported.

Orlić & Jurisić, 1986b: 50.

**KAŞ** 537 Map 1 Turkey

36° 8' N. 29° 38' E. (approx.). Said to be near Kaş; exact location and depth not reported.

Amphoras. 13th-14th centuries AD (?).

A wreck with 'late medieval' amphoras was located by an INA survey in 1986. The amphoras, apparently unparalleled (but not illustrated or described) are said to resemble those in another wreck not far away, which might be **Knidos D**.

Smith, 1987: 3.

Kaş (Bronze Age wreck): see **Ulu Burun**.

**KASTELLÓRIZON** 538 Map 1 Greece

36° 7' N. 29° 32' E. Beneath cliffs on the W. side of Kastellórizon (Castello-rosso) island, near Kaş. Depth: between 10 and 50 m.

Pottery.

Early 13th century AD.

A wreck of glazed pottery is known from material in the local museum and in foreign collections. One group of plates has incised motifs - bird, fish, octopus, star; the other group are painted. The 'free-style' decoration is not commonly found; although the glaze gives an impression of luxury, in fact the plates are thick and not very regular in shape.

There is at least one other wreck on Kastellorizon, but its date is not known.

Michailidou & Philotheou, 1989; Loucas, 1989.

Information: J. Wood.

**KAVO VODI**

**539**

Map 13

Greece

36° 23' N. 28° 14' E. At Cape Vodi (Voudhi) in NE. Rhodes; 500 m off shore. Depth: 23-27 m.

Amphoras.

Mid 5th century BC.

A rather scattered wreck of Chian amphoras has been surveyed and published. Pottery was also found. There appear to be other wrecks, not described, in the area.

Kazianes et al., 1990: 231-2.

Kefallinia: see **Lixouri & Plitharia**.

**KEFAR SHAMIR**

**540**

Map 14

Israel

32° 47' N. 34° 57' E. Near Kefar Shamir, S. of Haifa; 100 m from shore. The site is located, but not named, in the published report. Depth: 3 m.

Tin and lead ingots.

14th-13th centuries BC.

A group of eight bar-shaped tin ingots, two hemispherical tin ingots and five small lead ingots, with signs or inscriptions, represent the remains of a ship's cargo. A few metres away were found an Egyptian plaque, an Egyptian sickle-sword (with its wooden handle), and five stone anchors, one bearing the Egyptian sign Hafr ('life'). Nothing of the ship was preserved.

Raban & Galili, 1985: 326-8.

**KEFAR SHAMIR SOUTH**

**541**

Map 14

Israel

32° 47' N. 34° 57' E. To the S. of the previous site; exact location and depth not reported.

Tin ingots.

5th century BC.

A scattered hoard of bar-shaped tin ingots and 5th century BC coins represents a scattered Phoenician wreck.

Unpublished.

Information: E. Galili.

**KEPEÇ** 542 Map 13 Turkey

36° 59' N. 27° 50' E. (?). Near Kepeçe Burnu, on a reef. Depth: 5-10 m.

Amphoras. 7th-6th centuries BC.

Only brief reports have been published of a badly broken-up wreck deposit including looped-handle amphoras and a bowl.

Bass, 1974: 335; 1975, site L, no.4.

**KERME GULF** 543 Map 13 Turkey

36° 59' N. 27° 44' E. (approx.). Near **Sheytan Deresi**. Depth: 20 m (?).

Tiles. Late Roman/Byzantine.

Several ancient tile wrecks are known in the Kerme Gulf area, according to Dumas. A cargo of approx. 5,000 tiles, at 20 m depth, together with amphoras and coarse pottery (variously dated 4th-12th centuries AD), is described and illustrated by Frost. This is perhaps the site referred to by Bass as 'a deeper wreck of tiles not dived on during the survey'.

Frost, 1963: 214-7; Dumas, 1972: 148; Bass, 1974: note to site 1.

Kerme Gulf: see also **Gökova** and **Sheytan Deresi**.

Khios: see **Af-Yannis Tholou**, **Atalanti**, **Ayios Stephanos**, **Delphinion**, **Komi** & **Prasso**.

**KIMI** 544 Map 13 Greece

38° 38' N. 24° 6' E. From the harbour at Kimi (Kyme) on Euboia; the site was discovered in 1900 by a diver working on a new mole.

Copper ingots. 15th century BC.

Seventeen whole ingots and two fragments (now in the Numismatic Museum, Athens) presumably represent a shipwreck; the ingots weigh between 5 and 19 kg, and are comparable with those from **Antalya**. A search for the wreck in 1962 revealed nothing.

Déchelette, 1910: 398; Bass, 1966: 87; Throckmorton, 1970a: 219.

**KIMOLOS** 545 Map 13 Greece

36° 48' N. 24° 33' E. (approx.). On Kimolos island; exact location unknown.

Amphoras. Mid 4th century BC.

The amphoras include Heracleian amphoras (?) of this approximate period. The wreck is said to be well-preserved.

Unpublished.

Information: P. Throckmorton (from verbal reports).

**KIZIL AĞAÇ ADASI** 546 Map 13 Turkey

36° 44' N. 27° 23' E. Detailed location not reported. Depth: 5-7 m.

Amphoras (?). Undated.

A scattered cargo, described as of undated pottery, has been briefly reported.

Bass, 1975, site K (no. 3).

**KIZIL BURUN** 547 Map 13 Turkey

36° 36' N. 27° 58' E. On an underwater slope at Kizil Burun. Depth: 45 m.

Amphoras. c. 300-250 BC.

Hellenistic Rhodian amphoras made up the cargo of a much-looted wreck, surveyed by INA in 1980. A lagynos was also raised from the site.

Rosloff, 1981: 280.

**KNIDOS A** 548 Map 13 Turkey

36° 40' N. 27° 23' E. 1 km SE of Knidos; on a rocky bottom. Depth: 36 m.

Pottery. 2nd-1st centuries BC.

A cargo of cups, lamps, and two-handled bowls was located. The hull is probably not preserved. Some material in Bodrum Museum may also be from this wreck.

Bass, 1974: 335, no. 3; 1975, site D (no. 1).



**KNIDOS B**                              **549**                              Map 13                              Turkey

36° 40' N. 27° 23' E. Near wreck A; 'almost completely on rock'. Depth: 36 m.

Roof-tiles.                              2nd-1st centuries BC (?).

A large cargo of roof-tiles was mixed with coarse pottery and some amphoras.

Bass, 1974: 335-7, fig. 3; 1975, site E (no. 16).

**KNIDOS C**                              **550**                              Map 13                              Turkey

36° N. 27° E. 'Off the last promontory you can see from the site of classical Knidos'; at the foot of a cliff. Depth: 35 m.

Amphoras.                              c. 450-425 BC (?).

Chian amphoras, said to resemble those on coins of 449-435 BC, formed the cargo of a well-preserved wreck. Olive-pits were found in at least one amphora. A lekythos was also found.

Frey, 1982.

**KNIDOS D**                              **551**                              Map 13                              Turkey

36° 40' N. 27° 23' E. (approx.). 'Near Knidos'; location not reported. Depth: 32 m.

Amphoras.                              13th-14th centuries AD ?

A wreck, probably mostly buried in sand, 'may be very late Byzantine'; the amphoras have been described, but not identified or illustrated.

Pulak, 1985a (site 3).

**KOMI A**                              **552**                              Map 13                              Greece

38° 11' N. 26° 2' E. 1 km N. of Emporio on the SE. coast of Khios (Chios); among rocks, close inshore. Depth: 2-3 m.

Amphoras.                              Late 5th-early 4th centuries BC.

The amphoras lie scattered in shallow water, and were identified in situ as Attic by V.R. Grace. Only a brief report and an underwater photo of the site have been published.

Garnett & Boardman, 1961: 104-5 & pl. 17a.

**KOMI B**                              **553**                              Map 13                              Greece

38° 11' N. 26° 2' E. Immediately N. of wreck A. Depth: 2-4 m.

Roof-tiles and terracotta pipes. Roman period.

The cargo consists of a deposit of tiles and pipes; two Roman amphora-necks of unstated type were found nearby. Unfortunately it has not been possible to identify the date or other details of the cargo from underwater photos.

Garnett & Boardman, 1961: 104-5; Dumas, 1972: 148.

Information: M.W.M. Pope.

**KOPPO** 554 Map 1 Cyprus

35° 2' N. 32° 16' E. At Koppo island in W. Cyprus. Depth: 2-3 m.

Amphoras. 1st century BC (?).

A badly broken-up cargo comprised four different types of amphoras, of which the main type is described as Late Hellenistic Rhodian. Other finds include coarseware, the rim of a pithos, and part of a moulded glass bowl. No illustrations of the finds have been published.

Bass & Katzev, 1968: 170-1.

**KORČULA** 555 Map 1 Croatia

42 58' N. 17 0' E. (approx.). The exact location, condition and depth are unknown.

Amphoras. Mid 2nd century BC (?).

Amphoras from a wreck off Korčula (now in museums at Cologne and Mainz) have been published, but nothing has been reported about the site. The cargo evidently comprised a variety of Italian amphoras, including Lam. 2 and Apulian, as well as some which are transitional from Graeco-Italic to Lam. 2. One Lam. 2 amphora was stamped **QC...** For a similar cargo, cf. **Vis C**.

Carrazé, 1970e; 1970f; 1975: 28-9 & pls III & V.

**KORNAT** 556 Map 8 Croatia

43° 44' N. 15° 23' E. Apparently at Kasela island, S. of Kornat. Detailed location and depth not reported.

Amphoras. 1st century AD (?).

A wreck of 1st century AD amphoras has been summarily reported.

Vrsalović, 1974: 53 & 240, no. 6.

See also **Opat**.

**KÖTU BURUN****557**

Map 13

Turkey

36° 23' N. 29° 6' E. In SW. Turkey, S. of Fethiye. Depth: 36-42 m.

Amphoras and large jars. 11th century AD (?).

A Byzantine wreck lies scattered on a rocky slope. The cargo included over 60 amphoras and 10 large, globular jars, according to Pulak; the amphoras were of her form 1, and of two sizes, according to Günsenin. Amphoras of this form are normally late 10th or 11th century in date.

Pulak, 1985a (site 1); Günsenin, 1990: 22 & figs 7-8.

**KRAVA****558**

Map 8

Croatia

43° 4' N. 16° 13' E. At Krava rock, in the entrance to the harbour of Vis (cf. **Vis C** for another wreck here). Depth not reported.

Amphoras. 1st-2nd centuries AD.

A wreck of Dr. 2-4 amphoras and pearshape amphoras of Italian type has been briefly reported.

Cambi, 1989: 323-5.

**KUÇUK KERAMIT****559**

Map 13

Turkey

37° 5' N. 27° 14' E. At Kuçuk Keramit Adasi; 200 m from the W. tip of the island. Depth not reported.

Amphoras. c. 300 BC (?).

A group of twenty amphoras, perhaps Samian in origin, represents the visible remains of this wreck. The amphoras are similar to the 'Samian' amphoras of **Kyrenia**, hence the date.

Rosloff, 1981: 282.

**KURBA VELA****560**

Map 8

Croatia

43° 42' N. 15° 30' E. At Kurba Vela island; detailed location and depth not reported.

Amphoras. c. 150-1 BC (?).

A reference to a find of Lam. 2 amphoras at Kurba Vela describes the site as 'dislocated', but it seems reasonable to accept it as a shipwreck.

Orlić & Jurisić, 1986b: 50.

Kurdoglu Burun: see **Fethiye**.

**KVARNER GULF**

561

Map 8

Croatia

45° N. 14° E. In the Kvarner gulf; detailed location and depth not reported.

Amphoras. 1st century AD (?).

A correspondence item refers to two wrecks on 'the Kvarner islands, off Rijeka'. The first is apparently **Baška**, on Krk island. The second has a cargo of amphoras of Koan type (cf. Panella & Fano (1977) type 6; Grace (1961) fig. 57). The site may lie somewhere on Krk or Cres islands.

Plongées, **76** (November 1971): xvi.

**KYNOSOURA**

562

Map 13

Greece

38° 7' N. 24° 3' E. At Kynosoura point, near Marathon. Depth: 15-25 m.

Amphoras. 4th century BC.

A cargo of mid 4th century BC amphoras, much robbed, but recognizable as the remains of a small or medium-sized wreck, was visited by P. Throckmorton. The amphoras included some which resembled type N<sub>2</sub> of El **Sec**. Throckmorton says the wreck was in shallow water.

Classical Greek amphoras (including Chian) were found at Kynosoura by Braemer & Marcadé. The cargo covered an area 20 x 12 m; they state the depth as 15-25 m. This is presumably the same wreck as Throckmorton's. The rest of the material reported by Braemer & Marcadé must include wreck cargoes, but, in their view, 'to evaluate the number of ancient ships, small and large, which sank at Cape Stomi would be very hazardous'.

Braemer & Marcadé, 1953: 142.

Information: P. Throckmorton.

**KYRENIA**

563

Map 1

Cyprus

35° 20' N. 33° 19' E. Near Kyrenia on the N. coast of Cyprus; on a flat, sandy bottom, some distance offshore. Depth: 27 m.

Amphoras, nuts and other cargo. c. 310-300 BC.

Discovered by a local diver, this well-preserved wreck was excavated by M. Katzev in 1969-72. The cargo, when first surveyed, formed a tumulus covering 10 x 19 m. 404 amphoras were found, from Rhodes and other sources probably including Samos, Paros, Crete and Palestine; the 343 Rhodian amphoras include several with stamps. There were some 10,000 almonds, which were found lying in clusters, indicating that they were carried in sacks. Post-excavation study of the hull shows that there must have been a heavy load of something perishable (cloth?) in the forepart of the ship if she were to be trimmed level.

Shipboard items found aft included tools, twelve unhewn tree limbs, two

rolls of lead and various pieces of cooking equipment; the lie of the cargo showed there had been a bulkhead of sorts towards the stern, but no evidence was found for a fixed galley or other stove on board. Plates, bowls, saucers, cups and wooden spoons were found in sets of four, suggesting that this was the number of crew. One plate bore the Greek graffito **EYH**, for some such name as Eupator. In the stern locker were found over 150 lead brail-rings, rigging pieces, iron ingots in bundles, a marble louterion, and the remains of food, including almonds, olives, pistachios, hazelnuts, pomegranates, lentils, garlic, herbs, grapes and figs. The forepeak was not divided off, and the net-weights found forward had perhaps been attached to a net lying on the foredeck.

The hull was well-preserved, built mostly of Aleppo pine, with tenons of Turkey oak and a pulley-block of mulberry; she was sheathed below the waterline in lead, and carried a single sail. Twenty-nine rubbers of grey volcanic stone had been laid along the bottom of the ship, to one side of the centre-line; since they were not all finished, and did not make up a set of pairs, they were evidently compensating ballast - the only example of this so far recorded from the ancient Mediterranean. There is no evidence for a pump, though there is a sump, just forward of the mast-step, which must have been emptied by hand with a bucket. The ship's overall length was originally 13.6 m, the beam 4.4 m; the hull has now been reconstructed on land. The ship displaced 14 tons; 20 tons of cargo were found in the excavation. Details recovered (including altogether 176 brail-rings and several wooden toggles), together with a scale model of the (restored) hull, indicated that the ship could make about 4-5 knots with a favourable wind, and could sail 'amazingly' close to the wind if necessary. A full-scale replica, the Kyrenia II, has now been built and sailed; the replica was built of Samos pine, with manila rigging and a linen sail. Launched in 1985, in 1986, laden with 9 tons of cargo, she sailed from Piraeus to Paphos (600 nautical miles) in 3 weeks. In 1987, she sailed back with a crew of four; she rode out three gales and averaged 2.85 knots over 500 nautical miles (including stops); she could regularly make over 9 knots (with a maximum log reading of 12 knots), and sailed well close-hauled at 50 -60 off the wind.

Several coins of Antigonus Monophthalmos and Demetrius Poliorketes found on board the wreck (mostly among the remains of fishing-nets on the foredeck) indicate a date between 310 and 300 BC for the wreck. Various C<sub>14</sub> dates from the timbers have been published; one (BM-1639) at 2630±45 bp is impossibly old, while others, ranging from 2222±43 to 2124±60 bp, are compatible with the archaeological date. The ship was old when she sank, since she had been repaired at least three times, and sheathed in lead to help keep her watertight. Spears which were found embedded in the outer surface of the hull suggest that the ship may have been captured and scuttled by pirates.

Swiny & Katzev, 1973; Katzev, 1969a; 1969b; 1970; 1972; 1974; 1978; 1986; 1989; Green et al., 1967; Tylecote, 1977: 274-5; Morel, 1981: 65; Booth, 1984; Steffy, 1985a; Throckmorton, 1987: 55-9.

Information: M.L. Katzev; R.C.M. Piercy; J.R. Steffy; F. Talbot-Vassiliadou.

#### KYThERA

564

Map 13

Greece

36° 12' N. 23° 3' E. (approx.). At S. Nicolò on Kythera (Kithira) island; detailed location not reported. Depth: 10-15 m.

Amphoras.

c. 50 BC-AD 110.

A cargo of amphoras of Rhodian type was discovered by P. Throckmorton in 1973-4 but no report has appeared.

Unpublished.

Information: G. Kapitän.

**LADISPOLI A**

**565**

Map 9

Italy

41° 57' N. 12° 3' E. Off Torre Flavia (q.v.), near Ladispoli (Tuscany); on a flat, muddy bottom. Depth: 12 m.

Amphoras and dolia.

c. AD 1-15.

A fairly well-preserved wreck has been partly excavated by P. A. Gianfrotta and V. D'Atri. The centre of the ship was occupied by dolia, in three files; there were either eight or ten bulbous dolia in each of the outboard files, with either three or four cylindrical ones down the middle. The dolia were pitched inside, and had flat lids with a central handhold; each could have held 3,000 litres and would have weighed 1 ton. One is stamped (in a foot-shaped cartouche) **SOTERICVS** | **PIRANI.FEC** and (in square) [**SOTE**] | **RIC F.** Fore and aft of the dolia were over 40 Dr. 2-4 amphoras of Campanian type (stopped with corks).

In the after part of the ship were a few Haltern 70 (Baetican) amphoras, doubtless ship's supplies, and a good deal of cooking and table pottery. The pottery included several pieces of stamped Arretine ware. There was a lead jar (as found on other dolium wrecks at La **Garoupe** and **Diano Marina**) and half-a-dozen volute lamps, some with smoke-blackened nozzles. Some remains of furniture, perhaps part of the ship's fittings, survive; these include a duck's head (with coloured glass inlays) and a volute from a couch. A small wooden box, containing the remains of coriander and cumin seeds in two textile bags, was found in the after part of the wreck. Together with it were two Arretine plates, bearing the graffiti (under the base) **RAPPVL** and **MEDEOR LAPPV**; the second apparently offers a cure ('medeor'), in the name of L(ucius) Appu(leius) - either a travelling doctor or one of the ship's complement. Another plate bore the graffiti **APR**.

The hull, of normal construction, is well-preserved; no trace of lead sheathing has been found. Seven wooden discs, part of the bilge-pump, were found in the bilge. The ship would have been approx. 20 m long, with a shallow keel and a flat bottom - a river boat or a coaster, rather than a sea-going ship.

Gianfrotta, 1981c; 1984; Freschi, 1984a; D'Atri & Gianfrotta, 1986.

**LADISPOLI B**

**566**

Map 9

Italy

41° 55' N. 12° 6' E. SE. of Ladispoli, just S. of the castello of Palo. Depth: 17-20 m.

Marble columns.

c.AD 25-100 (?).

The cargo comprised nine columns, of a marble not yet identified, lying in three files of three. Two lead anchor-stocks were found close to the wreck; one survives, and is inscribed **TIBERI** - **EPAPR**. This name (that of the ship's owner, Tiberius Epaphroditus) is presumably that of an Imperial freedman, perhaps the

Epaphroditus who waited on Nero at the last. The wreck may thus be dated in the middle or the second half of the 1st century AD.

Gianfrotta, 1981a; 1981c: 70-2.

Lago di Monate: see **Monate**.

**LAMPEDUSA A**

**567**

Map 1

Italy

35° 29' N. 12° 36' E. Off Lampedusa island (S. of Sicily); location and depth unknown.

Amphoras. c. AD 300-350 (?).

Material in a private collection on Lampedusa evidently derives from a 4th century AD amphora wreck. Amphoras of several Afr. 2 or cylindrical types are represented, together with pear-shaped and globular amphoras and amphoras of forms Kapitän 2 and Riley MR4. The makeup of the cargo thus appears to be similar to that of **Femmina Morta** and other sites of this period, though the association of all the material cannot be guaranteed.

Unpublished.

Information: G. Kapitän.

**LAMPEDUSA B**

**568**

Map 1

Italy

35° 29' N. 12° 36' E. From a site somewhere off Lampedusa; said to be 25 m deep.

Amphoras. c. 100 BC (?).

A single Rhodian amphora (in private hands) is all that is known of this site. One handle has been lost; the other retains an illegible stamp. The date is estimated from the shape of the amphora.

Unpublished.

Information: G. Kapitän.

Lampedusa: see also Punta Giutgiu and **Punta Sottile**.

**LAMPIONE**

**569**

Map 1

Italy

35° 32' N. 12° 19' E. Off Cavallo Bianco (not found) on Lampione island (W. of Lampedusa). Depth not reported.

Amphoras. 1st century BC (?).

A survey of Lampione in 1986-8 revealed various material to the W. of the island, and a scattered wreck at a site not closely located. The wreck had fragmentary amphoras of form Lam. 2 and a Dr. 1B neck.

Panvini, 1991: 196.

### **Lara (Cyprus)**

Two large timbers from a ship, with bronze nails and lead sheathing, were found, but without any other material of a kind appropriate to a shipwreck as such.

Giangrande & Richards, 1985: 162.

### **Larnaca (Cyprus)**

A hoard of six gold darics of the 4th century BC was found by divers in a rock cavity off Larnaca. It seems there was no other associated material which might suggest a shipwreck.

Report of the Director of the Department of Antiquities of Cyprus, 1978: 46 & fig. 53.

Information: V. Karageorghis.

For wrecks and other finds in the Larnaca area, see **Cape Kiti**.

**LASTOVO A**                                  570                                  Map 1                                  Croatia

42° 46' N. 16° 54' E. (approx.). Detailed location and depth not reported.

Amphoras.                                  5th century AD (?).

A wreck, said to consist of 5th century AD amphoras, has been summarily reported.

Vrsalović, 1974: 53 & 240.

**LASTOVO B**                                  571                                  Map 1                                  Croatia

42° 46' N. 16° 54' E. (approx.). On a steep, stony slope; depth not reported.

Amphoras.                                  Mid 2nd century BC (?).

A deposit, 23 x 17 m, of amphoras represented a perfectly preserved cargo concreted to a steep slope. The amphoras are of an early type of Lam. 2, very similar to Graeco-Italic. When sand was cleared around the main deposit, a louterion was found, upside down, among amphoras. Two jugs were also found.

Orlić & Jurisić, 1987c; Radić, 1991.



**LASTOVO C, D, E & F**    572-575    Map 1    Croatia

42° 46' N. 16° 54' E. (approx.). Detailed location and depth not reported.

- |           |                                 |                           |
|-----------|---------------------------------|---------------------------|
| <b>C.</b> | Lam. 2 amphoras.                | 1st century BC (?).       |
| <b>D.</b> | Lam. 2 amphoras.                | 1st century BC (?).       |
| <b>E.</b> | Graeco-Italic amphoras.         | 3rd-2nd centuries BC (?). |
| <b>F.</b> | Roman amphoras of unknown type. | Roman period.             |

No details have been reported of these wrecks, which are all said to have been totally destroyed by looting.

Orlić & Jurisić, 1987c.

**LASTOVSKA**    576    Map 1    Croatia

42° 47' N. 17° 19' E. In Lastovska, on Mljet island. Depth not reported.

Amphoras.    c. 50 BC-AD 110 (?).

A summary report states that this wreck's cargo comprises amphoras of the 1st century BC-AD, including Rhodian amphoras.

Vrsalović, 1974: 53 & 240.

**LAURONS A, LES**    577    Map 1    France

43° 16' N. 5° 1' E. 'Les Laurons I', one of at least seven wrecks in the cove of Les Laurons, at the E. side of Fos bay; 46 m from shore. Depth: 2½ m.

No cargo.    3rd-4th centuries AD.

One of several abandoned ships lying in Anse des Laurons was partly excavated in 1978 & 1981. The remains extended 13 x 4 m; the after part of the ship was covered to a depth of 15 cm by ballast stones, with a calculated weight of 6 tons. No cargo remained, but material recovered from the ship included pitch (a small pile amidships), animal and fish bones, nuts, pine kernels, and stones of peach, plum and olive. Wooden objects found comprised a wedge, a needle, a spoon and a marline-spike; there were also a bone marline-spike, a copper button, and a pottery plate, jar and pitcher.

The ship was constructed of evergreen oak (treennails and tenons), oak (keel) and pine (strakes). There was a shim of copper in the stempost joint; one of the frames was a reused keel; nails of both bronze and iron were used in the assembly.

Carre, 1983; Ximénès *et al.*, 1985: 39; Ximénès & Moerman, 1987; Pomey *et al.*, 1989: 21-5. Site mistakenly referred to as site B by Foerster, 1986.

**LAURONS B, LES**    578    Map 4    France

43° 16' N. 5° 1' E. 'Les Laurons II' (Site K); 23 m W. of wreck A. Depth: 2 m.

Amphoras (and corn?). c. AD 175-200.

A well-preserved ship lay deep in the sandy bottom, heeled 20° to port; the site has been excavated by J-M. Gassend (1978-83). Her cargo had obviously been salvaged, but some Gaulish amphoras (of unstated type) have been found, as well as (in the ship's bottom) some corn, a 'clayey dust', and pitch. There was also one cylindrical (Tripolitanian?) amphora, full of pitch. Shipboard material included wooden utensils, t.s. chiara A, coarseware and a lamp. Two coins lay on the keel; one is a denarius of Divus Antoninus Pius (AD 161-180).

The ship's hull (actual dimensions 13.3 x 6 m) can be restored as 15 m long x 5 m beam. Much of the deck (4 cm thick, and assembled with horizontally-placed nails) was preserved, complete with part of the rail and the cargo-hatch, which measured 5.7 x 3.0 m, with provision for three covers. There was an access way in the bulwark, with a sliding hatch, three-quarters of the way forward. The depth of hold below the main-beam (1.4 m) was one-third of the beam, showing that this convention for the hull-form of a sailing vessel holds good for Roman ships, too; it also emphasizes the small dimensions and restricted capacity of what the excavators call a coaster. Details such as the pump-well were preserved, though the pump itself (like much else, no doubt) had been salvaged in antiquity. One of the steering-oar mountings was preserved, and a complete (spare) steering-oar lay inside the hull. Some of the dead-eyes from the standing rigging were found, and a tool for whipping rope. The ship appears to have been swamped by a tidal wave while being careened for repair. The final results of study of the wreck will give us the most complete picture yet of a Roman merchant ship.

Gassend et al., 1984 (with hull plans, etc.); Tortorella, 1981: 361; Carre, 1983: 202; Gassend, 1983; DRASM, 1983: nos. 382-7; 1985: 103-5 (no. 454) & 132; Ximénès et al., 1985: 40.

**LAURONS C, LES** 579 Map 4 France

43° 16' N. 5° 1' E. 'Épave III'; approx. 90 m SSW. of wreck B. Depth: 2 m.

Ballast. 3rd century AD (?).

One of three or four vessels sunk one on top of another. This ship was ballasted with stone blocks; finds included pottery, amphora necks, glass fragments, coins and items of rigging. The remains of the hull extend 10.0 x 4.6 m, representing a ship 15 m long. The pump-well appears to have been cut out after the ship was completed and launched. Under the port quarter was found the wooden arm of an anchor, complete with a lead reinforcement collar.

The amphora fragments found are said (by Carre and by Ximénès et al.) to be of forms Dr. 20 and 'Pélichet 47' (= Laubenheimer G4), and the date of sinking to be the late 3rd or early 4th century AD; this date must be too late if the amphoras were correctly identified, since neither of the forms named can post-date the third quarter of the 3rd century.

Carre, 1983: 230; Santamaria, 1984b: 113-4; Ximénès et al., 1985: 40-1.

**LAURONS D, LES** 580 Map 4 France

43° 16' N. 5° 1' E. 'Épave IV'; partly underlying the stern of wreck C. Depth: 2 m.

No cargo.

c. AD 310-340 (?).

This wreck had been mostly destroyed by fire. What remained of the hull (about the same size as the others found at les Laurons) was especially well-preserved, including the removable ceiling-planks with finger-holds. The mast had been in place when the ship was burnt, for the mast-step remained unburnt inside, but the mast had later disappeared. Some coins were found, including one of Constantine I (mint of Trier), and the remains of a wood-and-lead anchor.

Ximénès et al., 1985: 40-2; Ximénès & Moerman, 1988.

#### **LAURONS E & F, LES**

**581-582**

Map 4

France

43° 16' N. 5° 1' E. 'Épaves V & VI', at Site M, 75 m S. of wreck A; 5 m from shore. Depth: less than 1 m.

No cargo.

4th century AD (?).

Only preliminary excavation has taken place on two further ships' hulls in Anse des Laurons. One was only approx. 10 m long, the other 18-20 m long.

Ximénès et al., 1985: 42.

#### **Laurons, Les: other sites**

Site VII, at first thought to be a wreck, turned out to be harbour debris. Site VIII, published by Ximénès et al. (1985: 42) as a late Roman ship partly underlying the bow of wreck C, has since been reported by Pomey et al. (1989) as in fact part of wreck C. Two further deposits at Les Laurons (sites 9 & 10) may turn out to be wrecked stone cargoes.

#### **LAVEZZI (BALISE)**

**583**

Map 6

France

41° 19' N. 9° 15' E. 'Épave de la Balise de Lavezzi', 2 km S. of Lavezzi island; 50 m N. of the beacon, which marks a hidden reef. Depth: 15 m.

Amphoras.

c. AD 45-70 (?).

A scattered, fragmentary cargo of S. Spanish amphoras has not been studied in detail. The published amphoras are two of form Dr. 14, one Dr. 2-4 (most probably Spanish), two bases (Dr. 28?), a miniature Dr. 14, and a Dr. 20 of Claudio-Neronian type. The makeup of this cargo is similar to that of **Lavezzi C**, only 2 km away to the north.

Bebko, 1971: 2, & figs 256-63.

#### **LAVEZZI A**

**584**

Map 6

France

41° 20' N. 9° 15' E. 'Lavezzi I', off the N. point of Lavezzi island, in the Bonifacio Strait; on rocks beside 'La Tortue' reef. Depth: 6-13 m.

Amphoras, glass vessels, and copper and lead ingots.  
c. AD 25-50 (?).

A large cargo of goods, mostly from S. Spain, was made up of amphoras of several forms. These included Dr. 20, Dr. 14, Dr. 7-11 and Haltern 70 amphoras which appear to be of mid 1st century AD date; some other amphoras (Gaulish, of Laubenheimer type G5, and pear-shaped amphoras probably from Etruria) were at first thought to be associated, but in fact are likely to have come from elsewhere. Nothing in the published description suggests there were two wrecks at the site, and W. Bebko has confirmed (pers. comm.) that, despite his initial doubts, he is convinced the site was unitary.

What is certain is that the Haltern 70 amphoras were closely associated with both the copper ingots (Laubenheimer-Leenhardt, 1973: fig. 65) and the lead ingots (Bebko, 1971: fig. 117; reproduced by Parker, 1980). At least 18 copper ingots were recovered; some bore a serial number incised on their edge. An unknown number of lead ingots (not less than seven) were present; the mould-mark was mostly illegible, and the control-marks visible on the ends have been only imperfectly read (stamp **M.B.A** and incised mark **L.AM**).

The remains of half-a-dozen glass bottles, both square and round, doubtless also represented cargo. Olive-pits were found in quantity, some in an amphora. There was a considerable quantity of coarse pottery, but nothing closely datable. Of the ship's hull, practically nothing other than copper nails survived.

The assortment of amphoras, associated with lead and copper ingots, is extraordinarily similar to the (earlier) wreck of **Sud-Lavezzi B**; fortunately, the situation and circumstances of discovery of the latter excluded the uncertainties over dating and contamination which remain for Lavezzi A. That there was, in fact, a well-defined wreck-deposit here is beyond reasonable doubt, despite confusion in the references published by Benoit (see Parker, 1981).

Simi, 1961; Benoit, 1962: 174; 1971a: 155; Bebko, 1971: 2, 4, & 19-28; Laubenheimer-Leenhardt, 1973: 10-29, 114-9, etc.; Parker, 1980: 48-50; 1981b: 314-7.

Information: W. Bebko (who sent unpublished information and comments about this and other wrecks off S. Corsica).

#### **LAVEZZI B**

**585**

Map 6

France

41° 20' N. 9° 15' E. 'Lavezzi II', 100 m E. of Lavezzi lighthouse. Depth: 19 m.

Amphoras.

c. AD 40-70.

The majority of the amphoras were of two types of form Dr. 7-11, mostly Cam. 186A, with some Dr. 9. Many bore pre-firing graffiti and traces of an internal lining. Terracotta stoppers were also found. Other types of amphora were found in smaller number; these were mostly Spanish, either other types of Dr. 7-11, or Dr. 20. The wreck is securely dated to the period Claudius-Nero by a variety of S. Gaulish terra sigillata stamped by potters active at that period. Other finds, beside grey-ware, included a small bronze cylinder containing antimony, a little bronze bell, and two glass bowls. The hull was partially preserved, but has suffered owing to removal of cargo by looters. The

hull construction included nails both of solid copper and also of copper-clad iron. A hollow stone is thought to have been a mast-step, but nothing similar has been found in other wrecks; could it be the remains of a stone weight?

An object illustrated by Bebko resembles the tin ingots from **Port-Vendres B**, though it is said to be of lead; it, too, may be a tin ingot (Beagrie, 1985).

Tchernia, 1969: 496; Bebko, 1971: 2, 4-5, & 29-34.

Information: W. Bebko.

**LAVEZZI C** **586** Map 6 France

41° 19' N. 9° 15' E. 'Lavezzi III'; on a reef which breaks surface 50 m S. of Becchi point, Lavezzi island. Depth: 6-12 m.

Amphoras. c. AD 50-100 (?).

Only a small amount of cargo remained on this site (perhaps it was salvaged in antiquity). All the distinctive sherds were of Dr. 14 and Dr. 17 amphoras; there were at least three miniature Dr. 14 amphoras, 60 cm tall, which may have been for samples. The full-size Dr. 14, and perhaps the Dr. 17 amphoras too, were closed with terracotta stoppers. A small jar is the only shipboard item reported; no timber survived.

Bebko, 1971: 2,5, & figs 194-204.

**LAVEZZI D** **587** Map 6 France

41° 20' N. 9° 15' E. 'Lavezzi IV'; just W. of Cala Lazarina, Lavezzi island. Depth: 15 m.

Amphoras. c. AD 100-150 (?).

This wreck, described as small and scattered, included Dr. 20 amphoras, probably of early 2nd century date; the other amphoras as published are hard to classify but include bottoms probably of forms Dr. 14 and Beltrán 2B (?). No other finds or remains of the ship have been reported.

Bebko, 1971: 2, 5, & figs 205-8.

'Lavezzi E'

No wreck-deposit is distinguishable among the material found in the anchorage of Cala Lazarina, and referred to as 'Lavezzi 5' by Bebko (1966); cf. Bebko, 1971: 5.

**LAVEZZI F** **588** Map 6 France

41° 20' N. 9° 15' E. 'Lavezzi VI'; close to shore on the NE. side of Lavezzi island. Depth: 7-10 m.

Amphoras.

c. AD 300-325.

A scattered cargo was made up of cylindrical amphoras (of four types) and pear-shaped (Mauretanian) amphoras. There were also some small, flat-bottomed amphoras (cf. Panella 47, or Manacorda, 1975/6: 230-2). Other finds included at least three pottery 'vaulting tubes', as well as domestic ware; an anchor-stock was found nearby, but no timbers survived. The cargo is comparable with **Femina Morta**; it is dated only by the form of the amphoras.

Tchernia, 1969: 496; Bebko, 1971: 2, 5, & figs 245-55.

**LAVEZZI G, H, J & K**

**589-592**

Map 6

France

41° 20' N. 9° 14' E. (approx.). 'Lavezzi VII-X'; scattered sites in shallow water.

Amphoras.

1st-2nd centuries AD.

Four sites, merely deposits of sherds, found on the W. (more exposed) side of Lavezzi island, have produced Spanish amphoras of the first two centuries AD. A neck from Lavezzi G (Bebko, fig. 95) is not immediately identifiable as Spanish, but the drawing may be inaccurate.

Bebko, 1971: 2, & figs 95 & 294.

**LAZARET**

**593**

Map 3

France

39° 52' N. 4° 18' E. At 'Ses Lloses', near Sa Mola fort in the entrance of Mahon harbour (Minorca); E. of Lazaret island. Depth: 15-20 m.

Amphoras.

Late 3rd-early 2nd century BC.

The site was first discovered by helmet divers in the early 1900s. The cargo consisted of Greek and Graeco-Italic amphoras, much resembling the contemporary **Grand Congloué A** wreck. The Graeco-Italic amphoras were numerous, and were in full, half and quarter sizes; they were corked, and sealed with mortar which was marked with anepigraphic rectangular or circular impressions (cf. **Grand Congloué A** and **La Ciotat A**). The Greek amphoras included several Rhodian (stamped), Cnidian and Coan. There was also, apparently, a consignment of Camp. A black-gloss ware, including lamps.

Shipboard items included a grey-ware lamp and some coarseware. There was a lead ring with a pierced tang, and a sounding-lead with no tang but with holes to attach the line. Tiles (both imbrices and tegulae) were found, and may be from a structure on board. The wreck lay in a mud and sand bottom, and the hull was preserved; wood, copper nails and fragments of lead sheathing have been recovered. There were traces of fire on the timbers.

Serra Ràfols, 1961a: 216, no. 1; Nicolas, 1973; Fernández-Miranda, 1977: 820-1; Fernández-Miranda et al., 1977: 83-94 (with new drawings).

**LAZZARETTO**

**594**

Map 6

Italy

40° 35' N. 8° 15' E. In Lazzaretto cove, W. of Alghero (Sardinia); 40 m from shore. Depth: 2 m.

Amphoras. c. AD 320.

Preliminary details have been published of a late Roman wreck, excavated in 1985-6 by E. Riccardi. Illustrated amphoras are cylindrical and Afr. 2D; others are said to be of forms Almagro 50, Almagro 51C, Dr. 20 and Dr. 30. Remains of preserved fish were found inside many of the amphoras. Part of a mould (a cake-mould?) of known African type was found. The concreted contents of a money-bag (presumably originally worn on someone's waist) included the impression of a follis of Licinius, struck in AD 315/6. This date is too late for Dr. 20 amphoras, unless they were re-used. Some of the hull timbers have been raised.

Riccardi, 1986; 1987; D'Oriano, 1989.

**LEMNOS** 595 Map 13 Greece

40° 20' N. 25° 25' E. (approx.). In deep water between Lemnos and Samothrace.

Amphoras and pottery. 4th century BC.

A fisherman brought up two plain amphoras, two Red-Figure pelikai and a bell-krater, a lamp and a small plate. This must have been a wreck site, especially if there were more finds, not declared.

Touchais, 1983: 804 (from press reports).

#### **Lemnos: other sites**

Material found by sponge divers in Moudros Bay (S. of Lemnos) must come at least in part from ancient wrecks, but no information about the sites concerned has been published. Another find from the sea off Lemnos is an equestrian statue of Augustus, which could have been removed from Rome by Constantine for re-erection at Constantinople.

Daux, 1967: 742; Archaeological Reports 1979-80, 47, fig. 80; 1986-7, 51.

Levanzó: see **Cala Mindola** and **Punta Altarella**.

Licata: see **Rocca di San Nicola**.

**LIDO DI SANT'ANNA** 596 Map 10 Italy

40° 40' N. 17° 56' E. Near Acque Chiare, W. of Brindisi; NW. of the Lido. Depth: shallow.

Amphoras. c. 150 BC-c. 25 BC.

A large, broken-up and looted wreck of Lam. 2 amphoras has been briefly reported by Sciarra, who identifies the amphoras as form Dr. 6 and names the site Acque Chiare (q.v.). There are said to be several lead anchor-stocks, one with four knucklebones and a Greek inscription, from the same area.

Sciarra, 1985: 145-6.

Information: G. Kapitän.

**LIMENI** **597** Map 1 Greece

36° 41' N. 22° 22' E. (approx.). On the S. shore of Limeni bay in the Peloponnese. Depth not reported.

Amphoras. Early 1st century BC.

A large merchant ship, wrecked on the coast in the 1st century BC, was investigated by the Greek Underwater Archaeology Department in 1977. Some amphoras were raised; no report has been published. This could possibly be the same site as **Areopolis**, q.v.

Touchais, 1978: 678 (from press reports).

**LINDOS A** **598** Map 13 Greece

36° 5' N. 28° 5' E. (approx.). Near Lindos (Rhodes); 500 m SE. of Ayios Pavlos harbour. Depth: 27-30 m.

Amphoras. c. 50 BC-AD 100 (?).

A group of about sixteen amphoras, some complete, lay on a rock and sand bottom; they were apparently Rhodian, of early Imperial form. No other details have been reported.

Nikolitsis, 1981: 47-9.

**LINDOS B & C** **599-600** Map 13 Greece

36° 5' N. 28° 5' E. (approx.). Off Lindos; detailed location not reported.

B. Amphoras. 6th century BC. Depth: 35 m.

C. Cargo not reported.  
Date unknown. Depth not reported.

Press reports stated that fishermen had found two wrecks off Lindos, which were subsequently surveyed and sampled by the Greek Underwater Archaeology Department. No details have been published.

Catling, 1983: 60; Touchais, 1983: 817 (who mentions only wreck B).



**LION DE MER, LE****601**

Map 5

France

43° 24' N. 6° 46' E. Close under the SE. side of Le Lion de Mer islet, near Saint-Raphaël. Depth: shallow.

Tiles. 1st-2nd centuries AD (?).

A wreck of several hundred tegulae has been briefly reported, with a drawing of one tile.

Joncheray, 1987a: 81.

For other material which may have come from Le Lion de Mer, see **Dramont C.**

Lipari: see **Pignataro di Fuori, Punta Crapazza, Punta di San Francesco, Secca del Bagno** and **Secca di Capistello.**

**LITTLE RUSSEL A****602**

Map 15

Channel Islands

49° 27' N. 2° 32' W. 200 m E. of the harbour of Saint Peter Port (Guernsey). Depth at low tide: 12 m.

Amphoras. Late 1st-early 2nd century AD.

Several amphoras, all of form Beltrán 2B, albeit with variations, were found protruding from a bottom of sand and gravel near Saint Peter Port. No detailed investigation of the site has been carried out, but underwater photos indicate that it is most likely a shipwreck.

Keen, 1979 (with drawing of amphora reproduced at approx. 1:18, not as captioned).

**LITTLE RUSSEL B****603**

Map 15

Channel Islands

49° 27' N. 2° 31' W. (approx.). East of Saint Peter Port; precise location unknown. Depth: approx. 50 m.

Amphoras. c. AD 1-75 (?).

Fragments of Baetican amphoras, cf. Dr. 7-11, were brought up by a trawler from the Little Russel channel. This probably represents a wreck, though there is as yet no corroborative evidence.

Keen, 1986: 140-1.

**Livorno (Italy)**

Four Roman portrait busts, salvaged in 1720, could be from an ancient cargo.

Ciacci, 1981.

**LIXOURI** **604** Map 1 Greece

38° 12' N. 20° 27' E. In SW. Kefallinia (Cephalonia); 300 m from shore. Depth: 4 m.

Statues and architectural pieces.

Roman period.

Six marble statues and six architectural fragments were raised by the Greek Underwater Archaeology Department in 1980. All the statues (three male nudes, a draped female and a seated male) were headless; the other pieces were two Ionic capitals and four half-column bases. A search of the area apparently revealed no further remains or information about the presumed wreck.

Touchais, 1981: 805 (from press reports .

**LOGONOVO** **605** Map 8 Italy

44° 39' N. 12° 15' E. (approx.). Found in silt at Lido di Spina (near Comacchio) in 1958.

No cargo.

Late 15th century AD.

A two-masted boat, 10.05 m long, built skeleton-fashion of oak, with some larch, was excavated by N. Alfieri. The boat is dated by associated pottery.

Alfieri, 1968: 106-7; Bonino, 1978: 15-18; Berti, 1986b: 25.

**LONDON (BLACKFRIARS)** **606** Map 15 Britain

51° 30' N. 0° 6' W. The 'Blackfriars ship'; under silt and recently reclaimed land on the N. side of the R. Thames.

Stone (?).

Late 2nd-early 3rd century AD.

The ship, excavated by P. Marsden in 1962-3, was built some time after AD 88-9 (mast-step coin); her sinking was datable stratigraphically. She originally measured approx. 15 m overall, with an estimated tonnage of 92 tons. Some fragments of stone found in the bottom indicated that the ship had been used to bring building stone from the R. Medway area of S. Britain to London, and she may have sunk while still laden. Finds included a grinding-stone, pottery, tools and various items of equipment. The hull (recorded in detail, and partly conserved) was 'skeleton' built, using iron nails. Damage to the stern preceded and probably caused the wreck.

Marsden, 1967; 1972.

**LONDON (COUNTY HALL)** **607** Map 15 Britain

51° 30' N. 0° 7' W. The 'County Hall ship', discovered under river silt on the S. side of the Thames near Westminster Bridge, London.

No cargo.

Late 3rd century AD.

A Roman ship was discovered during building work in 1910, recorded and raised. She originally measured 20 m long, and was built with a 'Mediterranean' technique, using mortice-and-tenon joints, from European deciduous oak. She was abandoned after AD 296, on the evidence of four coins.

Gomme & Riley, 1912; Marsden, 1965a; 1967; 1972.

**LONDON (NEW GUY'S HOUSE)**

**608**

Map 15

Britain

51° 30' N. 0° 5' W. The 'New Guy's House boat', partly exposed in 1958 in Southwark, on the S. bank of the R. Thames.

No cargo.

c. AD 200.

Part of a carvel-built ship, estimated length 15 m, with part of the inner planking preserved, was recorded; the rest probably survives in situ under the modern ground level.

Marsden, 1965b; 1967; 1972; 1976: 48-9.

London: Guy's Hospital

A 'barge' found at Guy's Hospital a few years before 1889 could have been Roman, but nothing worthwhile is known about it.

Marsden, 1963; Ellmers, 1972: 277.

Losa: see **Sanguinet**.

**LOŠINJ**

**609**

Map 8

Croatia

44° 32' N. 14° 30' E. (approx.). Off the E. coast of Losinj island, not far from Mali Losinj; close to shore, on a sloping seabed. Depth: 20-35 m.

Amphoras and architectural pieces.

c. 300-250 BC (?).

The site was found (and material recovered) by a visiting Italian diver in 1974; no official report has been issued. The cargo included Graeco-Italic amphoras of early type, and architectural revetments in painted terracotta; a louterion was also found.

Kapitan, 1979: 104-6.

**LUQUE A, LA****610**

Map 5

France

43° 16' N. 5° 17' E. In Marseilles bay, NW. of Pommègues island. Depth: 17 m.

Roof-tiles.

Mid (?) 2nd century AD.

This wreck lies only 200 m from another tile wreck, **Pointe Debie**; the tiles from the two wrecks are said to be identical (by Frost, 1963). The cargo, badly robbed, comprised both tegulae and imbrices. The tiles are rather small by comparison with other tile cargoes in S. France. Shipboard items found (in excavations) included a decorated S. Gaulish Drag. 37 bowl, as well as coarseware (some of which, fire-blackened, was found at one end of the site in an area free of tiles), as well as a sword (preserved in concretion). The ceiling was thicker than the outer planking, and the bottom profile was flat, with a sharp turn of the bilge; several repairs were noted. Two coins of Hadrian (AD 117-134) were found in the mast-step; the date of the wreck must be somewhat later, but presumably not much later in view of the terra sigillata bowl.

Frost, 1963: 218-9; Liou, 1975: 581; Liou & Négrel, 1977; Joncheray, 1987a: 84.

**LUQUE B, LA****611**

Map 5

France

43° 16' N. 5° 17' E. On a sandy slope near La Luque headland. Depth: 30-40 m.

Amphoras and lamps.

c. AD 300-325.

The cargo, when found in 1970, consisted of a pile of sherds measuring 5 x 7 m, with other pieces widely scattered. The amphoras comprise four varieties of African amphoras, as well as a 'globe' amphora. One amphora was stamped, and some contained langoustine shells. The ship also contained some 250 lamps, of characteristic African type; they were all found in a single area of the site. At least one terra sigillata bowl was found, but pottery does not seem to have been carried in any quantity. The lamps (which bear a variety of stamps, including **VICTOR | INVS** and **DE OFFICINA CECILI**) are thought to be 3rd century in date by Balil (1980), 4th century by Liou, but an early 4th century date for the amphoras is confirmed by Keay (1984).

The hull was built carefully of rather slight (3 cm thick) planking, with a shallow keel (of oak) which was fastened to the frames with iron bolts. The planking was not lead-sheathed, but covered in fabric; internally, as well as a mast-step, there was a wooden block with two holes cut in it, the bottom part of the ship's pump. The ship is estimated as originally 20 m long, 6 m in beam.

Joncheray, 1972c; Négrel, 1973; Clerc & Négrel, 1973; Liou, 1973: 579-84; 1975: 578-81; Carrazé, 1976a: 65-6 & fig. 1; Carre & Jezegou, 1984: 121.

Information: B. Liou; R. Lequement.

**MA'AGAN MIKHA'EL****612**

Map 14

Israel

32° 32' N. 34° 54' E. Near Kibbutz Ma'agan Mikha'el, close to the shore. Depth: 1-2 m.

No cargo (?).

c. 430-390 BC.

A probable Phoenician ship, 13-15 m long, found in 1985, has been excavated and raised by E. Linder, A. Raban and J. Rosloff. There is no cargo, but finds include cooking and table pottery, lamps, baskets, tool handles, a whetstone, a stone ornament, a scoop (for incense?), a carpenter's square, wooden palettes, and remains of figs and olives. There were also four violin-shaped wooden boxes, and a heart-shaped box (for weights?). The very light structure (mostly of Aleppo pine) was assembled by well-spaced mortice and tenon joints; in many respects the ship resembles the **Kyrenia** and **Marsala** vessels, but there are some significant differences. All the frames are floors, and are joined to futtocks with a hook scarph, thus constituting 'made frames'; they are fastened to the planking by treenails which are transfixed by clenched iron nails. The construction of the stern is also unusual. The hull was covered by 12 tons of ballast-stones, many of them schist slabs, laid on grass matting over pistachio dunnage, and fastened to the planking by iron nails. By the ship's bow was found a one-armed wooden anchor, with a stock of wood containing a pair of lead filling-pieces. Much of the pottery is from Cyprus, some is Levantine, and a few pieces may be Greek; the various wood species found in the ship and her equipment could have come from the Levantine coast, and the pollen is typical of the Phoenician coast in summer. The ballast stones, on the other hand, are of five lithic types, and derive from the Tyrrhenian Sea, Corsica or Calabria.

Wachsmann & Raveh, 1987a; Linder, 1989; Rosloff, 1990; 1991; Kahanov, 1991.

Information: A. Raban.

**MACCHIA TONDA, LA**

**613**

Map 9

Italy

41° 59' N. 11° 57' E. (approx.). To the S. of S. Severa bay, off the headland of La Macchia Tonda. Depth: 10-12 m.

Amphoras.

c. AD 50-100 (?).

Material collected from a deposit of amphoras well known to spear-fishermen includes amphoras similar to Dr. 14, pear-shaped amphoras of Gaulish type, and a small amphora with a flat bottom (perhaps not a cargo container). A lead anchor-stock has also been raised from this area. The date (second half of 1st century AD) given by Gianfrotta is possibly too early; compare **Tiboulen de Maïre**, datable late 1st or 2nd century AD, another wreck containing both Gaulish and Spanish amphoras. Other sites with Gaulish amphoras are later still, cf. **Procchio**.

Gianfrotta, 1982: 17-18.

**MADDALENA**

**614**

Map 6

Italy

41° 15' N. 9° 25' E. (?). At an unidentified location near Maddalena island (NE. Sardinia). Depth not reported.

Cargo uncertain.

Roman period (late Imperial?).

Only a brief reference has been made to a recently-discovered wreck with 'a cargo which could have included glass objects'.

Villedieu, 1984: 200 & note 177 (p. 253).

For other sites in the Maddalena islands, see **Cala di Li Francesi**, **Punta Sardegna**, **Santa Maria** and **Spargi**.

**MADONNINA, LA**

**615**

Map 10

Italy

40° 17' N. 17° 32' E. At Campomarino (near Taranto); on a reef, 550 m offshore, near the chapel of Maria SS. di Altomare. Depth: 10 m.

Amphoras.

c. 325-300 BC (?).

The wreck (excavated by P. Throckmorton, 1965) comprises three large stone anchors of pyramidal form, and a scatter of amphoras extending approx. 45 x 90 m. The amphoras are of two forms: the first, unidentified, with a lip of triangular section, included one with a Greek stamp; similar amphoras were found at **Ognina D.** The second form, unstamped, is Corinthian A' (pace McCann). A lamp is datable to the second half of the 4th century BC, and a Gnathia sherd and some domestic pottery are also 4th-3rd century in date; the Corinthian amphoras are probably late 4th century. Also found were some terracotta beads (interpreted as fishing-net weights), a metal fitting, a brail ring and two sounding-leads.

McCann, 1972; Casson, 1971: fig. 187; Koehler, 1981: 457; Kapitän & Naglschmid, 1982: 230-2.

Information: C.G. Koehler.

**MADRAGUE DE GIENS, LA**

**616**

Map 5

France

43° 2' N. 6° 6' E. Some 350 m off the N. side of the Giens promontory (near Hyères); also known as Pointe de l'Ermitage. Depth: 18-21 m.

Amphoras, pottery and pine-cones.

70-50 BC.

This shipwreck was totally excavated by A. Tchernia and P. Pomey in 1971-1983. It is the biggest classical wreck yet to be excavated; the ship probably carried 400 tons of cargo, made up mostly of 6,000-7,000 amphoras. Most were of three varieties of Dr. 1B, stamped **P.VEVEI PAPI** and a number of single names; all were made in S. Latium, varieties 1 and 3 at Canneto, variety 2 at San Anastasia (not far away). The contents (shown by analysis to have been wine) were thought to have been the famous Caecuban wine, in whose area the amphora kiln-sites lay; however, Caecuban wine was white, it seems, whereas the wine aboard the Madrague de Giens ship was red. Some amphoras bore graffiti, and all were closed over a cork with one of five types of anepigraphic seal. There is no direct relationship between the amphora stamp and the amphora's shape, but there is a link between the shape and the type of seal, suggesting that small differences of shape served to differentiate contents, perhaps because of how the amphoras were supplied to wine-producers, and by no means always indicate the work of different potters. A fourth series of amphoras, in a different fabric, are stamped **Q.MAE ANT**, and were sealed with an inscribed sealing; these amphoras were loaded on top of the main cargo, as a 'complementary load'. Only one amphora with a painted label was found in the wreck; it read **PILEMO.QVAD**.

The cargo also included several hundred pieces of black-gloss pottery, much of it of non-Italian, albeit Western, fabric (according to Morel, 1981), or perhaps in fact 'Campanian B-oid' ware from Latium or N. Campania (as DRASM, 1985: 49). There were other wares, too, notably hundreds of coarseware plates, lids, jars and pitchers; the export of such pottery is a hitherto unknown feature of late Republican trade, and shows that some 'precocious Gallo-Roman' pottery is in fact of Italian origin. The pottery was packed in boxes, stowed on top of the amphoras. Several dozen pine-cones appear to be the remnant of another part-cargo, though 57 balls of blue frit are thought to have been for painting the ship. The cargo occupied the centre and fore part of the ship; space in the stern was partly filled with bundles of brushwood and a mass of volcanic sand, and was also used for accommodation.

A wide variety of shipboard objects and stores was recovered from the wreck, especially at the stern, where some objects had evidently fallen from the cabin and the poop-deck. One, two or three amphoras were found belonging to each of the following types: Lam. 2 (one stamped **M.LOLLIO.Q.F**), Pascual 1, Dr. 26 (stamped **LAPO**), Tripolitanian, Apulian (one stamped **[P]TOLEM**), Baetican (Haltern 70, and similar to Beltran 2A), Chian (one stamped **XAP**), Rhodian, Thasian, Coan and a type described as 'of Punic tradition with grooved body'. In addition to this varied stock, there were about 15 Dr. 1A amphoras, which (like some of the lamps found in the stern area) may have been a cargo consignment. By contrast, a collection of pottery, much of it bearing graffiti, of various types including Camp. A and grey Campanian ware, was certainly for shipboard use. A large jar of unusual type, the arm of a small marble statue, a weight, and an unusual type of bronze balance represent furnishings and equipment. Five lead ingots included two which had been partly used already, no doubt for shipboard repairs. A small lead anchor-stock (0.55 m long) was presumably for the ship's boat. There were two bronze helmets, and altogether 35 coins (20 bronze, 15 silver), of which the latest are two denarii of 75 BC. Many of the shipboard objects, and part of the cargo, were salvaged in antiquity by divers, whose stones lay abandoned in the upper layers of the wreck.

Blocks of various types, including a large one for weighing anchor, dead-eyes of various sizes, lead and wooden rings, cleats, and a concretion containing both rope and chain (attached to a ring), were among the elements of rigging found. No multiple blocks were recovered, though the ship must have had some; perhaps, like the cooking pots and the ship's pump, they were salvaged by the ancient divers. A davit from the stern area was probably for the steering-oar strop, and from the bows came a strongly-reinforced cathead with two rings for making fast an anchor. The ship had a hearth of small, rectangular bricks for cooking on. Among organic remains found were grapes, almonds and hazelnuts.

The hull was of fir (external planking), oak (frames, mast-step), elm, walnut, pine, etc. It was double-planked, and sheathed with lead over a fabric layer. Many other details were noted in excavation and from samples raised; contrary to first interpretations, the hull is of true 'shell-first' construction, in that the keel and strakes were assembled before any floors or frames were inserted; the fourth and fifth strakes, which have treenails driven in from outboard, are replacements, not part of the original structure. The keel was 1 m deep, offering substantial resistance to leeward drift; the ship was clearly built with a view to fast, efficient sailing. The restored dimensions of the hull are 40 m overall, 9 m beam, and 4.5 m deep inside the hold. The ship (on the evidence of the pine-cones) set sail for the last time in June, July or August.

Tchernia *et al.*, 1978. See also: Chevalier *et al.*, 1971; Domergue *et al.*, 1974; Hesnard, 1977; Gianfrotta, 1978; Morel, 1981: 64 & 96; Pomey, 1981b; 1982; Tchernia & Pomey, 1978; Akerraz *et al.*, 1981-2: 208; Carre, 1983: *passim*; DRASM, 1983; 1985: 130-1; Liou & Pomey, 1985: 559-67; Tchernia, 1982; 1986: 135; 1987; 1989; 1991; Hesnard & Gianfrotta, 1989: 431.

**MADRAGUE-DE-MONTREDON, LA**                      **617**                      Map 5                      France

43° 13' N. 5° 19' E. 600 m W. of Cap Croisette (bay of Marseilles). Depth: 40 m.

Amphoras.    c. 175-125 BC (?).

A Punic amphora (a relatively late variety of Mañá type C) and a 2nd-century BC Campanian lamp were reported from a wreck at this site, but no further information has been published. There was Iberian painted pottery, too, according to Gianfrotta & Pomey (1981: 173).

Benoit, 1962: 159-60; cf. Benoit, 1965a: pl. 42, 9-11.

**MAESTRO-MARIA**                                      **618**                                      Map 6                                      France

41° 36' N. 9° 20' E. (?). At Maestro-Maria islet, near Porto Vecchio (Corsica).

Pottery.    'Classical period'.

A shipwreck with a pottery cargo (undated) is reported summarily by Bebko, and listed by Fonquerle, who also mentions amphoras.

Bebko, 1966: 107; Fonquerle, 1972: 62.

**MAGNONS A, LES**                                      **619**                                      Map 5                                      France

43° 4' N. 5° 45' E. At the foot of Les Magnons, 150 m from Les Embiez (near Le Brusç). Depth: 30 m.

Amphoras.    c. 50 BC-AD 50.

Only brief reports have been published of a scattered wreck at Les Magnons. Amphoras found are said to include Dr. 8 and Dr. 12 (from Baetica) and Dr. 2-4. These last are presumably not of Spanish type, since the site is not listed by Corsi-Sciallano & Liou (1985).

This site is near **Grand Rousseau** and is at the same depth, but must be another since the Grand Rousseau wreck was not discovered till 1975.

Benoit, 1956: 30; 1962: 169.

**MAGNONS B, LES**                                      **620**                                      Map 5                                      France

43° 4' N. 5° 45' E. On the last rock of Les Embiez. Depth: 6-10 m.

Lead and brass ingots.                                      4th-2nd centuries BC ?

A scattered cargo of ingots was seen by F. Dumas in 1963; there was apparently no associated pottery or other material. Nineteen lead ingots were raised, weighing from 7 kg to 28 kg; they were of roughly-cast shape, marked with symbols and some Greek letters. There were also small, yellow ingots (20-50 cm long) of plano-convex form; these were 79% copper, 21% zinc. There is no



dating evidence; Dumas wondered if the wreck was pre-Classical, but Pollino notes a resemblance between some of the lead ingot inscriptions and some from **Ploumanac'h**, which suggests a date not earlier than the late pre-Roman Iron Age.

Dumas, 1972: 181-5; Pollino, 1984: 11-12.

**MAHDIA**

**621**

Map 1

Tunisia

35° 30' N. 11° 4' E. Found three miles NE. of Ras Mahedia by sponge divers in 1907. Depth: 40 m.

Marble columns, works of art and lead ingots.

c. 110-90 BC (?).

A large cargo, with 70 marble columns, bases and capitals, plus both full-size and miniature bronze sculptures, marble basins, vases and candelabra, and bronze decorative pieces, has been examined on several occasions between 1907 and 1955. The cargo may have included the several lead ingots of Spanish origin which were found, though elsewhere (eg. at La **Madrague de Giens**) a few lead ingots were carried as part of the ship's stores. The 70 columns, of Attic marble (either Hymettan or Pentelic), weighed some 205 tonnes; the whole cargo must, therefore, have totalled about 250 tonnes, which agrees with estimates of the ship's size based on the measured length (26 m) of the keel.

Shipboard items included four lead anchor-stocks, tiles, a human perineum, a mill-stone, assorted amphoras, and pottery. The pottery can be firmly dated to the last years of the 2nd century BC (some of the amphoras seem too late for this date, but were perhaps not genuinely associated with the wreck). The wreck can thus have no association with the sack of Athens in 86 BC, contrary to some assertions.

Part of the keel (of elm) was raised; the ship was double-planked, at least over the garboard strake (with fabric between the two layers), and lead-sheathed. Recently, some components of a machine, thought to be for bailing the bilge-water, have been identified among material from the wreck by G. Kapitän; they may, alternatively, be parts of a catapult, as suggested by D. Baatz. The marble columns must have been stowed, five or six abreast, in the bottom of the ship, with the other goods between and on top of them.

Columns of Attic marble were used by L. Licinius Crassus in a theatre he erected between 105 and 103 BC, and were subsequently built into his house in Rome. The large number of columns in the Mahdia wreck, varying in size from 1.85 to 4.4 m, together with the statuary and other items, may well have been intended to front a theatre scene-building at Rome. The same Crassus is known to have appreciated couches decorated in bronze, such as were also found at Mahdia. The wreck may therefore be seen as a good example of the role played by returning Roman cargo-ships in bringing to Italy works of art from Greece for senatorial connoisseurs of the late Republic.

Merlin, 1912; De Frondeville, in Taylor, 1965: 39-53 (with references to earlier accounts); Fuchs, 1963; Morel, 1981: 61-4 & 335; Coarelli, 1983; Kapitän, 1983; Baatz, 1985. See also Frost, 1963: 127; Basch, 1972: passim; Grace, in Weinberg et al., 1965: 13; Tailliez, 1967: 80-94. A date in the first quarter of the 1st century BC: Braemer, 1986: 145.

Information: V.R. Grace.

Mahón (Minorca): see **Lazaret**. Stamped African amphoras were reported summarily (without context) from Mahón by A. Balil in Fasti Archaeologici, 28-9, no. 1116.

**MAINZ A** 622 Map 15 Germany

50° 0' N. 8° 16' E. Found in 1887, immediately N. of the cathedral, in a mud layer of the early Empire period (if not earlier). The boat, which was not raised or drawn, was described at the time as a Nachen (flat-bottomed, with sides sloping inboard).

Ellmers, 1969: 87; 1978: 3-6.

**MAINZ B-G** 623-628 Map 15 Germany

No cargo. Early 5th century AD.

Found and excavated in 1981/2 during the building of a hotel in Lührstrasse. There were nine ship-fragments (belonging to five ships), a dugout, and a spar; a sixth plank-built ship was destroyed without record. All five plank-built ships were keel-built on a plank 20 cm wide and less than 4 cm thick; they were very lightly constructed. The frames (irregularly spaced) and floors are flat-sectioned amidships, V-shaped at the ends; the planks were laid on edge-to-edge, without joints or (in most cases) caulking, and fastened with iron nails, driven in from outboard and clenched. They had a floor mast-step, and a through-beam for the steering-oar; there was no evidence for decking. Four of the five (here, **B**, **D**, **E** and **F**) were single-banked galleys, probably fifteen oars a side, for military use. Ship B was built of wood felled in AD 376, and repaired in AD 385 and AD 394. All the ships were out of commission when they grounded; the few finds from in and around the ships included boat-hooks of iron and net-weights and line-weights of lead and stone. They were no doubt stripped and abandoned after the Vandal conquest of Mainz in AD 406.

**B.** (No. 1). 8.29 m long; might have had a tent roof.

**C.** (Nos 3, 5 & 8). Preserved length 14.75 m; three of the futtocks had carved terminals (the only ornament on these ships), and aft of the mast-step were traces of a cabin. This ship, shorter and broader than the others, was evidently for carrying personnel.

**D.** (No. 4). A 10 m long fragment of a ship's side.

**E.** (No. 7). Similar to B; preserved length 10.62 m.

**F.** (No. 9). Restored length 21 m.

**G.** A dugout.

Rupprecht, 1982; Hückmann, 1982; 1985: 140-3; 1988; 1991.

**MAINZ H & J** 629-630 Map 15 Germany

No cargo. Late 1st-early 2nd century AD.

Found in 1982 at Kappelhof (600 m from Lührstrasse). They were two barges, similar to **Zwammerdam**, etc. One measured 3.7 m wide and over 11 m long; it was made from trees felled in AD 81.

Rupprecht, 1982: 166-72.

**MAÏRE A**                                  **631**                                  Map 5                                  France

43° 12' N. 5° 19' E.                  At the W. point of Maïre island, in the bay of  
Marseilles. Depth: 30 m.

Amphoras.                                  Mid 2nd-end of 1st century BC.

An Apulian amphora, its stamp erased, was found off Maïre; it was full of 'pozzolana', and was stopped with a disc cut from an amphora. It is not clear from references by Benoit (1956) and Tchernia whether there was a whole cargo of such amphoras, though this is stated by Carraze. The site, whatever its true nature, at least provides an example of the reuse of amphoras in ancient commerce; shiploads of such cargoes are very rare (but cf. **Culip D** and **Yassi Ada A**).

Benoit, 1956: 28, no. 4; 1961a: 50, note 9; Carraze, 1970f: 43; Tchernia, 1971a: 79.

**MAÏRE B**                                  **632**                                  Map 5                                  France

43° 12' N. 5° 19' E.      50 m W. of Les Farillons channel, between Maïre and the  
mainland; on a steep cliff slope. Depth: 40 m.

Amphoras.                                  Early 2nd century AD (?).

A large deposit of Dr. 20 amphoras was discovered by J-Y. Cousteau and F. Dumas in 1952; the amphoras (to judge from the published profile) are probably of early 2nd century date. No information about the ship or any finds has been published.

Benoit, 1952b: 259; 1956: 28, no. 5.

**MAÏRE C**                                  **633**                                  Map 5                                  France

43° 12' N. 5° 20' E.      At the foot of the reef in Les Farillons channel. Depth:  
35 m.

Amphoras.                                  c. 110-90 BC (?).

A large cargo of Dr. 1A amphoras was discovered in 1952; the amphoras were sealed with mortar, marked with a design of three heads in an oval. Camp. B pottery (including a plate with the graffito **VAT**) also came from the site, but nothing has been reported of the ship's structure.

Benoit, 1952b: 259; 1956: 28, no. 6; 1962: 160-4; Carrazé, 1975: 44, 50, & pl. VI.7; DRASM, 1983: nos 69 & 270-4.

**MAÏRE D****634**

Map 5

France

43° 12' N. 5° 20' E. South of Maïre island ('epave 4 de l'île Maïre'). Depth: 35 m.

Amphoras. c. 125-75 BC (?).

A cargo of amphoras, at first said to be Dr. 1B but in fact Dr. 1A, included some which contained hazelnuts and one with a mortar seal stamped **ΛΥΚΑΙΘΟΥ** around a six-pointed star. Another find was a Camp. B cup with the graffito **NAY**. Nothing has been reported of any structural remains.

Benoit, 1962: 164; Carrazé, 1975: 44; Long & Ximénès, 1988: 172.

**MAJORCA****635**

Map 3

Spain

39° 50' N. 3° 40' E. (approx.). Between Majorca and Minorca; exact location, depth and condition unknown.

Amphoras. 2nd century AD.

Seven Dr. 20 amphoras of 2nd century AD form are illustrated by Mascaró; at least one is stamped, and one is unstamped.

Mascaró, 1971: 77, fig. 15.

See also **Cap Blanc, Colonia de Sant Jordi, Dragonera, Na Guardis, Porto Cristo, El Sec, Ses Salines.**

**Majsan (Croatia)**

At Majsan island (in the E. end of the channel between Korčula and Pelješac) a possible ancient wreck, lying in a few metres of water, was summarily reported in 1960; no further information has been published.

Mondo Sommerso (August, 1960): 55.

**MAKARSKA****636**

Map 8

Croatia

43° 17' N. 17° 1' E. At the entrance of Makarska harbour. Depth not reported.

Amphoras. 2nd century BC (?).

A wreck with a cargo of amphoras, said to be 2nd century BC, has been summarily reported.

Vrsalović, 1974: 53 & 240.

**MAL DI VENTRE****637**

Map 6

Italy

39° 59' N. 8° 13' E. 300 m NW. of Mal di Ventre island, off Sinis (Sardinia).  
Depth: 30 m.

Lead ingots. Mid 1st century BC (?).

Excavations in 1989 took place at Mal di Ventre on a cargo of some 1,000 lead ingots. At the ship's bow lay three lead anchor-stocks, decorated with astragali and dolphin, and at the stern was a large iron anchor. The ingots lay between, in rows; they weigh around 33 kg. Most are marked **SOC M C PONTILIENORVM M F** or **M C PONTILIENORVM M F**, a minority **CARVLIVS HISPALLIS** or **CARVLIVS HISPALIVS**; others have still to be read, including some with three cartouches, and marks containing an anchor or a dolphin. There were also fragments of Dr. 1 amphoras, the top part of a hand-mill, the remains of bronze utensils and some coarse pottery. Substantial remains of the ship's hull were preserved: she was evidently large, say 36 x 12 m. A thick lead sheet without fixing-holes lay under the ingots, over the hull - this could have been cargo, but perhaps was laid out to protect the wood.

Ingots marked by Planius Russinus and Valerius Rectus, reported from this area by Zucca, are isolated finds and not from the wreck.

Zucca, 1985: 150-1; Salvi, 1991.

**MALA JANA** 638 Map 8 Croatia

45° 3' N. 14° 27' E. In Mala Jana bay, on Krk island. Depth: 27 m.

Pottery. 14th-16th century AD (?).

A cargo of glazed bowls, plates and other pottery has been briefly reported.

Matejčić, 1976: 358.

**MALAMOCCO** 639 Map 8 Italy

45° 25' N. 12° 23' E. (approx.). Two miles N. of the modern Porto Malamocco, near Venice. Depth: 9 m.

Glass blocks. 15th century AD (?).

The remains of a late medieval ship carrying half-finished glass were discovered in 1980 and carefully surveyed. Lumps of iron may have been commercial ballast. The ship was armed with an iron breech-loading cannon (firing stone balls), falchions and swords. Other finds included a Turkish standard (made of tin), a bronze statuette of Hercules (apparently Roman), tools and spares belonging to the ship's carpenter, and three large anchors. It seems that no timbers survive. The cargo seems to be part of a trade in secondhand, recyclable materials.

Donariva & Griva, 1983; Gianfrotta, 1985b; Molino *et al.*, 1986.

Malban: see **Ploumanac'h**.

**MALTA****640**

Map 12

Malta

35° 54' N. 14° 45' E. (approx.). On a bank 20 km E. of Valletta. Depth unknown.

Amphoras.

Date unknown.

Amphoras dredged up E. of Valletta are thought to represent a wreck; their form is not stated.

Scicluna, 1965; Parker, 1979a: fig. 1, no. 6.

Malta: see also **Comino, Filfla, Mellieha, Munxar, Qawra, Saint George's Bay, Saint Paul's Bay** and **Xlendi**.

**MALVARROSA, LA****641**

Map 1

Spain

39° 33' N. 0° 18' W. (approx.). By a rocky outcrop N. of the harbour of Valencia; depth not reported.

Amphoras.

c. 250-175 BC (?).

Amphoras of various types - Graeco-Italic, Iberian, Punic and Massiliot - represent a 3rd century BC wreck, according to Ribera Lacomba. Several pieces of black gloss ware datable c. 200 BC probably also belong. Some later material was also found at the site.

In 1984-6, A. Fernández Izquierdo found Etruscan, Massiliot, Phoenician, Punic and Iberian amphoras datable late 6th-early 5th century in 14 m depth, but she does not identify this deposit as a wreck.

Ribera Lacomba, 1983; Fernández Izquierdo, 1984/5.

**MANDALYA GULF A****642**

Map 13

Turkey

37° 10' N. 27° 25' E. (approx.). One of three wrecks found close to a small island 'N. of Bodrum'. Depth: shallow.

Amphoras.

c. 50 BC-AD 50 (?).

The remains of a small cargo of Coan amphoras of the late 1st century BC or early 1st century AD were found, broken by wave action, by an INA survey in 1985.

Bass, 1986b: 214-5.

**MANDALYA GULF B****643**

Map 13

Turkey

37° 10' N. 27° 25' E. (approx.). Close to wreck A.

Amphoras.

3rd-2nd century BC.

A widely scattered wreck amphora cargo included fragments of several types, the most common probably identifiable as of the Nicandros Group.

Bass, 1986b: 215; cf. Grace & Savvastianou-Petropoulalakou, 1970: 365-7.

**MANDALYA GULF C**                                 **644**                         Map 13                         Turkey

37° 10' N. 27° 25' E. (approx.). In the same area as wrecks A and B. Depth: 37 m.

Amphoras.   10th century AD.

On a sandy bottom, the 1985 INA survey found a well-preserved wreck with about 50 pear-shaped Byzantine amphoras, datable to the 10th century. A trial pit found at least three layers of amphoras in situ, and the hull may be preserved, deeply buried.

Bass, 1986b: 215.

**MANGUB**   **645**                         Map 1                                 Libya

32° 50' N. 12° 15' E. Material found on two occasions in the sea off Mangub (Manqub), E. of Zuwara.

No cargo (?).   c. AD 315.

20,000 folles, found in 1922-3, and a further 8,000, dated AD 306-312, found in an amphora in 1930, are thought to derive from a single shipwreck.

Salama, 1966/7; Ward, 1970: 50.

**MARAONE**   **646**                         Map 11                                 Italy

37° 59' N. 12° 24' E. At Maraone islet, also spelled Maraome, off NW. Sicily. Depth: 30-35 m.

Amphoras.   1st century BC (?).

A large quantity of sherds of Dr. 2-4 amphoras remained on a looted site, together with ballast-stones and at least part of the ship's keel and frames. A copper nail found in the shipwreck is said to be round in section.

Picozzi, 1977.

**MARATEA A**   **647**                         Map 9   Italy

39° 55' N. 15° 46' E. Near Capo La Secca, S. of Maratea. Depth: shallow.

Amphoras.   Mid 1st century AD (?).

Numerous Dr. 2-4 amphoras, of at least two types, 'Coan' and Italian, lay scattered off Capo La Secca.

Bottini et al., 1984: 25.

**MARATEA B** **648** Map 9 Italy

39° 57' N. 15° 44' E. On the Secca della Giumenta, not far S. of Maratea. Depth: shallow.

Amphoras. c. AD 25-260 (?).

Many fragments of Dr. 20 amphoras represent a scattered wreck on this reef.

Bottini et al., 1984: 25.

**MARATEA C** **649** Map 9 Italy

39° 57' N. 15° 44' E. (approx.). Near the islet of Santo Ianni (or Santoianni), S. of Maratea. Depth not reported.

Amphoras. 3rd-4th centuries AD.

A wreck of Almagro 50 amphoras is known near Maratea. The cargo, which is not large, contains no other form of amphora - cf. **Randello**. Also found were a jug and a large-necked amphora or storage jar.

Unpublished.

Information: P. Bottini; A. Freschi.

See also **Santo Ianni**.

**MARATHON** **650** Map 13 Greece

38° 5' N. 24° 5' E. (approx.). Material brought up in fishing-nets near Marathon in 1925. Depth unknown.

Works of art (?). 4th-1st centuries BC (?).

The famous 4th-century BC bronze Boy of Marathon was found in nets together with fragments of wood, presumably from a Hellenistic shipwreck.

Rhomaïos, 1924-5; Bass, 1966: 79.

Marathon Bay: see **Kynosoura**.

**MARESQUEL** **651** Map 15 France



50° N. 1° E. In the R. Canche, Pas-de-Calais; detailed location and depth not reported.

No cargo. 2nd century AD.

An underwater survey in the Canche found a line of posts, with material of the 1st-2nd centuries AD, and, nearby, a boat. No further details have been reported.

Leman, 1979: 292.

**MARGARIDA** 652 Map 4 Spain

41° 40' N. 3° 6' E. (approx.). Material found by fishermen aboard the Margarida, 8 miles off San Felú de Guixols in NE. Spain. Depth unknown.

Amphoras. c. 150-100 BC (?).

Three amphoras, found together in a net, imply a wreck in deep water. Esteva & Pascual (1967) illustrate a Dr. 1A amphora and what appears to be the body of a Dr. 1C, but in another publication (1971) they illustrate only the Dr. 1A, and say the three amphoras are all of the same form. The 1967 version is probably correct.

Esteva & Pascual, 1967; Pascual & Esteva, 1971.

**MARGARINA** 653 Map 8 Croatia

44° 29' N. 14° 18' E. At Margarina Point, Susak island; depth, etc., not reported.

Stone. Roman Imperial (?).

A cargo of stone blocks and columns has been briefly reported. There were apparently 11 columns, of different sizes.

Vrsalovic, 1974: 53 & 240.

Marina di Montalto: see Le **Murelle**.

**MARINA PORTO** 654 Map 10 Italy

39° 55' N. 18° 24' E. Off Marina Porto (Porto Tricase) in Apulia; detailed location and depth not reported.

Amphoras. 3rd-2nd centuries BC.

A lead anchor-stock was found in an area which a preliminary survey showed was littered with broken amphoras of the 3rd or 2nd centuries BC. Further investigation would be needed to establish that this is definitely a wreck.

De Juliis, 1983: 516.

**MARINAS, LAS** 655 Map 1 Spain

38° 52' N. 0° 5' E. (approx.). At Las Marinas, near Denia; location and depth not reported.

No cargo. Late 2nd century BC.

The remains of a ship and ballast, datable to the end of the 2nd century BC, have been briefly reported.

Fernández Izquierdo, 1984/5.

**MARISMA DE LAS MESAS, LA** 656 Map 2 Spain

36° 48' N. 6° 11' W. Found under alluvium approx. 1 km E. of the ancient city of Asta Regia, near Trebujena (Cadiz).

Probably no cargo. 2nd-1st centuries BC (?).

A boat, approx. 6 m long, was found in 1958, but subsequently destroyed. Nearby were about ten amphoras, mostly Dr. 1, some pear-shaped. This area was part of a large lagoon in antiquity, and there are unsubstantiated reports of other boat finds.

Pemán, 1959; Menanteau & Pou, 1978: 184.

Marmara: see also **Ayitaşı Burnu, Erdek, Halkoz Adasi, Hayirsiz Ada, Paşalimani & Tekmezar Burnu.**

**MARMARIS A** 657 Map 13 Turkey

36° 52' N. 28° 17' E. (approx.). Material in Izmir Museum; location and depth unknown.

Pottery. 8th-9th centuries AD.

A number of Byzantine plates, evidently from a wreck, were acquired by the museum; they were said to come from near Marmaris.

Cook & Blackman, 1971: 35.

**MARMARIS B** 658 Map 13 Turkey

36° 52' N. 28° 17' E. (approx.). Material in Bodrum Museum; location and depth unknown.

Louteria.

Classical/Hellenistic period.

The number of louteria of similar shape and with similar concretions to be seen in Bodrum Museum and (one) on Patmos suggests that there must be a cargo of them somewhere N. of Marmaris.

Kapitän, 1989.

See also **Arap Adasi**.

**MARRITZA**

**659**

Map 6

Italy

40° 51' N. 8° 36' E. Off Tres Montes, E. of Marina di Sorso (Sardinia); close to the beach, partly on a submerged rocky outcrop. Depth: 3-4 m.

Cargo uncertain.

c. AD 75-125.

This shallow, exposed wreck is repeatedly buried by 1 m or more of shifting sand. A preliminary survey revealed roof-tiles and timbers lying among stones and sand (Gandolfi, 1986a: fig. 2). Excavations in 1981 produced fragments of amphoras (Dr. 2-4 and cf. Dr. 7-11), t.s. chiara A and 'a strisce', a black-walled ware saucepan and coarseware, indicating a date early in the 2nd century AD; several bronze pulleys and a hook probably came from this area. In 1982 this area was under sand; 85 m away to seaward lay four iron anchors, and excavations in this area revealed the remains of lead sheathing, together with a large pulley (perhaps for an anchor cable). Between the two excavated areas was found a wooden beam, possibly part of a mast.

No cargo as such was identified. Many horse bones were reported by the discoverers, under water and on the nearby land, though these were not found in 1982; the suggestion that the ship may have been carrying horses is thus not firmly supported.

Lo Schiavo & Boninu, 1985: 140; Pallarés, 1985a; 1986a; Gandolfi, 1986a.

**MARSA LUCCH**

**660**

Map 1

Libya

32° 5' N. 24° 30' E. On a shallow reef near Marsa Lucch (near Ras el Grain): exact depth not reported.

Amphoras.

c. AD 500-650 (?).

A relatively well-preserved cargo of amphoras lay in a hollow of the reef; the deposit was estimated as approx. 6 x 2 m in extent. The amphoras (of which there are examples in Oxford and Manchester museums) are 'spatheia' (Riley LR 8a). Another find was a wheel-ridged pottery funnel.

IJNA, 1 (1972): 204.

Information: A.J.N.W. Prag.

**MARSALA (PUNIC SHIP)**

**661**

Map 11

Italy

37° 53' N. 12° 26' E. The 'Punic Ship' of Marsala, also known as 'Motya' or 'Isola Grande'; one of a number of more-or-less complete ancient ships lying in sand at Punta Scario (q.v.), the NW. tip of Isola Grande (or Isola Lunga) in W. Sicily. About 50 m from shore. Depth: 2 m.

No cargo.

c. 250-175 BC.

The ship was an oared galley, which had been driven into the sand at 27 from the horizontal, perhaps by hostile action. The hull was completely excavated in 1971-4 and restored under the direction of H. Frost. Most of the keel, the port side and the stern were preserved. There was no cargo, but a considerable quantity of ballast-stones; these were mostly sedimentary rock and pebbles, and could have been collected on the NW. coast of Sicily, especially if some were re-used from other ships, though a few rocks are characteristic of Latium or Campania. Amphoras of several types and dozens of pieces of fine-wall, black-gloss and coarse pottery were found, some with Latin or Italic graffiti; the amphoras include Graeco-Italic of both early and later types and Punic amphoras. The pottery assemblage seems to belong best to the late 3rd or earlier 2nd century BC, though contamination can by no means be ruled out. Nearly all the pottery is of Italian, specifically Roman, type.

Bones found on the wreck included the remains of at least one human (presumably a crewman who was trapped as the ship went under), a small dog (the ship's mascot ?), ox, sheep or goat, fallow deer, pig and horse; some of the animal bones were butchered. The scapula of an unidentified bird and a gilthead bone were also probably food refuse. Hazel, almond and pistachio nuts and olive pits were found in the keel cavity and among the 'kitchen' material from the stern area of the wreck; wood of apricot, cherry, almond and sweet chestnut was found, but no fruit (except for almond shells), suggesting that the final voyage might have been in winter-time. Two baskets (woven from a sedge-like plant) contained stems probably of hemp; this could have been used to make a mildly narcotic drink for the oarsmen.

Equipment included a bowl of copper or bronze, a bone netting-needle, a besom, a barrel-bung, an iron knife and two marline-spikes; curiously, there were no lead rings, weights or other such objects. There was a considerable quantity of rope and line, all made of esparto; one eye-splice was found (in a storage area by the kitchen deposit, together with a spare sheet of lead). A few tile fragments came from the 'kitchen area'. The ballast-stones lay on dunnage including Phillyrea, myrtle, evergreen oak, cypress, lentisc, pine and ferns; the last could not have been found in western Sicily. Below the water-line, the ship was made of pine (possibly Corsica pine) planking, oak tenons and maple or oak frames. In the keel cavity were shavings which included beech, cedar (?) and pistachio; these no doubt derived from building the ship's superstructure. Beech would have to be imported from southern Europe; the other wood could have been found in North Africa. The hull was lead-sheathed, over a layer of woven fabric impregnated with resin; analysis of the lead indicates it could well have been made up in Carthage or western Sicily. The first eleven hull planks were assembled edge-to-edge, the floors were inserted, the higher strakes were placed on as a prefabricated unit, and then the frames were added. There was no ceiling, and no trace of a mast-step was found. Putty was used liberally to seat and steady timbers during building. About 200 signs, some of them Phoenicio-Punic words or letters, were painted on the wood to assist the construction process, for example by indicating places where nails were to be driven in, mortices cut, or floors placed relative to the keel. The lettering is thought to be typical of the period 300-250 BC and of the central Mediterranean, very likely Sicily. Some strakes were shaped with an external bevel to serve as spray-deflectors; these, and the garboard strakes, were carved to shape, but most of the planks were sawn. The ship was less than 5 m in beam and over 30 m long, displacing some 120 tonnes; if she was a warship, she was no

doubt a single-banked galley, of the type known in Latin as a liburna. A corrected date from C<sub>14</sub> samples is 235±65 BC, which has suggested that this ship and the Sister Ship were among the 50 Carthaginian vessels known to have been lost off the Aegates Islands in 241 BC. However, it is by no means certain that these ships were in fact warships; their ballast, their lead sheathing and their lack of a proper, bronze-clad warship ram show they were merchant galleys, according to Casson (1985), and this view is supported by the pottery and other finds from the excavation.

Frost, 1981. For a list of preliminary reports and discussion papers, see Purpura, 1986: 151-2.

**MARSALA (SISTER SHIP) 662 Map 11 Italy**

37° 53' N. 12° 26' E. The bow part of a Punic oared ship, lying in shallow water 70 m S. of the Punic Ship, and probably of the same period.

No cargo. 3rd century BC (?).

Only a survey and some sampling have been carried out on this ship; a painted Punic letter on the wood shows its relationship with the nearby hull. The ship is overlain by hard clay, presumably ballast. The planking was of pine (possibly Maritime pine, P. pinaster), the frames of Turkey oak, and one of the tenons was of olive wood. The hull appears to have been ceiled (unlike the Punic Ship), and iron nails were freely used, even in the ram assembly; there appears to have been a mast-step. The ram was sheathed in bronze, of which a small piece survives.

Basch & Frost, 1975; Frost, 1981: 265-70.

**MARSALA A 663 Map 11 Italy**

37° 46' N. 12° 26' E. At La Bambina, 2 km S. of Marsala; 40 m from the beach. Depth: 2 m.

Amphoras. c. AD 1150-1200.

An exceptionally well-preserved Arab ship was discovered in 1983. Some 80 small amphoras, with stoppers of cork, have been raised; their contents are as yet unidentified, but may have been a sugar product. Other finds included the two parts of a lava mill, a jug (for sugar-refining ?), and ballast of tiles, carved stones and tufa. The ship's hull measured about 15 x 3 m.

D'Angelo, 1984; Purpura, 1984; 1985.

**MARSALA B 664 Map 11 Italy**

37° 46' N. 12° 26' E. Adjacent to wreck A.

Cargo not reported. c. AD 1150-1200 (?).



43° 17' N. 5° 22' E. 'L'épave de la Bourse' or 'du Lacydon'; found in the silted-up harbour during contractors' excavations.

No cargo.

Late 2nd century AD.

A substantial part of a well-preserved Roman ship was found in a 2nd-century AD layer, overlain by a dumped fill of the 3rd century and associated with pottery datable AD 160-220. It was surveyed and raised, and has been conserved by means of freeze-drying. The ship, whose extant remains measure 20 x 7 m, was built mostly of Aleppo pine, with stringers and garboards of larch, and treenails and tenons of cypress, evergreen oak and olive. An estimated 85-90 trees were required to build the hull. A detailed study of the hull has revealed that it was assembled by an alternating procedure, in which groups of planks were fastened by treenails to a successively extended framework of floors, half-frames and futtocks. The primary floors were attached to the keel by copper bolts. The ceiling was made up of alternately fixed and free planks; the latter were rebated underneath to fit over the frames and so remain fast. The hull was covered externally with pitch. Some of the stringers bore incised epigraphic marks, unfortunately not readable. The mast-step, not fixed in place, was one-third aft along the ship. This was a broad ship, probably 9 m in beam; the overall length would have been 23 m, with a calculated tonnage of between 115 and 140 tonnes, probably the higher figure. The Bourse ship can have drawn only 1.2 m unladen, and, despite her size, was designed for work along coasts and in small ports.

Gassend, 1975; 1978b; 1980; 1982; Cuomo & Gassend, 1982; Gassend & Cuomo, 1985.

**MARSEILLE (GALÈRE DE CESAR)**

**669**

Map 5

France

43° 17' N. 5° 22' E. 'La Galère de Cesar', accidentally discovered in the silted-up Vieux Port in 1864. Part of the remains were recovered, and more were observed in foundation-shafts.

No cargo.

3rd century AD (?).

The ship's hull, of Bosnia pine, was seen over an extent of 17 metres. A portion was recovered; it measured 3.8 x 3.5 m at the time, though it has now shrunk. Although it is evidently towards one end of the ship, the lines cannot be restored and the original dimensions cannot be estimated. The emplacements for a mast-step and for a stringer are visible. Pottery said to have come from the site ranges in date from the 1st to the 3rd centuries AD, and suggests the 3rd century as a probable date for abandonment.

Varoqueaux, 1971; Basch, 1972: 51.

**Marta (Italy)**

A medieval mill-stone wreck in Lake Bolsena was summarily reported in Bollettino d'Arte, Supp. 4 (1982): 172.

**MARZAMEMI A**

**670**

Map 11

Italy

36° 44' N. 15° 8' E. 'Marzamemi I', lying in the bay NE. of Marzamemi (SE. Sicily). Depth: 7 m.

Amphoras and stone. c. AD 200-250.

The main part of the cargo was greyish white marble from Attica, lying rather scattered but recognizable as a ship's cargo. The 15 surviving blocks (some partly shaped as columns or architraves) weigh 172 tons, the largest 40 tons. Amphoras of types Kapitän 1 and 2, first recognized at this site, also originated in Greece; they were present in quantity, but it is not clear whether other fragments recovered (some of which appear to be African amphoras) represent cargo or shipboard supplies.

Kapitän, 1961: 290-300; cf. Parker, 1981b: 317-20.

**MARZAMEMI B**

**671**

Map 11

Italy

36° 45' N. 15° 8' E. 'Marzamemi II', the 'Church Wreck of Marzamemi'; in a hollow in the rocky reef in the bay N. of Marzamemi, close to wrecks D, G and H. Depth: 5-10 m.

Marble columns and other pieces. c. AD 500-540.

A substantial cargo of carved architectural pieces, long known to fishermen, was surveyed and partly excavated by G. Kapitän. This 'Church Wreck' comprises the major components of a small Justinianic basilica; the stone is 'verde antico' and white Proconnesian marble. Other finds from the site include an early 6th century t.s.chiara dish and some amphoras. Churches similar to the Marzamemi cargo are known from Ravenna and Cyrenaica; they were part of an imperial programme of reconquest and propaganda. It could even be that the wreck cargo was intended for the Central Church at Cyrenaica, whose ambo and western end were completed in local materials, not imported pieces.

Kapitän, 1961: 300-5; 1969; 1976b; Hayes, 1972: 264-5; Harrison, 1985.

**MARZAMEMI C**

**672**

Map 11

Italy

36° 44' N. 15° 8' E. Found during harbour mole construction S. of the old harbour of Marzamemi earlier this century. Depth: shallow.

Marble columns. Roman Empire period.

A column, now erected in a square at Pachino, was found, apparently with at least one other, some years ago; nothing is known of the underwater site. The surviving column, 20 feet tall, has an unfinished torus at top and bottom, and appears to be of red Nubian granite.

Kapitän, 1961: 312-3 ('Marzamemi III').

**MARZAMEMI D**

**673**

Map 11

Italy



36° 45' N. 15° 8' E. On the inshore side of the reef in the bay of Marzamemi (close to wrecks B, G and H). Depth: 3-7 m.

Amphoras. c. AD 325-350 (?).

Substantial numbers of pear-shaped amphoras of more than one type (including Beltrán 68), Afr. 2D, cylindrical and other amphoras were scattered widely over the surface of the submerged reef. Nothing remains of the ship.

Kapitán, 1965: 24-5 ('Marzamemi IV'); Parker, 1979a: 629-30; 1979b: 13-24.

**MARZAMEMI E**

**674**

Map 11

Italy

36° 45' N. 15° 8' E. Scattered on a rocky bottom NE. of Marzamemi. Depth: 7-8 m.

Amphoras. 4th century BC.

A broken-up cargo of amphoras was mostly raised in the 1960s without detailed recording; the amphoras were of Corinthian B type. Other material included a louterion and some roof tiles.

McWilliams et al., 1977.

Information: G. Kapitán (his 'Marzamemi V').

**MARZAMEMI F**

**675**

Map 11

Italy

36° 44' N. 15° 8' E. Between wrecks A and B; on the inshore edge of a large rocky shallow in the bay N. of Marzamemi. Depth: 5-7 m.

Amphoras. c. AD 275-300 (?).

An unknown quantity of material, raised from this scattered site in the 1960s, has been lost, but some fragments were found in a subsequent survey and enabled the cargo to be reconstructed. The amphoras were of Almagro 50, Almagro 51C and Afr. 2B-D forms, representing a mixed consignment of Spanish, African and perhaps other amphoras.

Parker, 1981b: 328-331.

Information: G. Kapitán ('Marzamemi VI').

**MARZAMEMI G**

**676**

Map 11

Italy

36° 45' N. 15° 8' E. On the reef in Marzamemi bay, immediately W. of wreck B. Depth: 7 m.

Amphoras. c.150 BC.

Only small fragments of Hellenistic amphoras survived, scattered on the rocky bottom and in sandy gullies. Roof tiles and some domestic pottery were

also found, but these have not been definitely attributed to this wreck. No timber or other material was preserved. As at wreck D, a mass of concreted material marks the 'nucleus' of the wreck. The most common form of amphora, while certainly of Greek form and fabric, has not been identified; the cargo also included several Rhodian and Cnidian amphoras, and there were smaller numbers of other Greek and Italian (Lam. 2) amphoras.

Parker, 1979b.

**MARZAMEMI H**

**677**

Map 11

Italy

36° 45' N. 15° 8' E. Overlain by the fragmented amphoras of wrecks D and G. Depth: 8 m.

Amphoras and grinding stones. Late 5th-early 4th centuries BC.

Only a small number of badly broken-up amphoras remain from the cargo of a classical shipwreck. The chief type of amphora present is found almost exclusively in the central Mediterranean, and probably originates from Magna Graecia (the 'West Greek' amphoras of **Porticello**); there are also two necks which resemble Corinthian amphoras. Two hopper-type lever-mill stones were probably the remains of a larger consignment, though the cargo spread and the quantity of amphoras indicate that this was only a small ship.

Kapitän, 1965; Parker, 1979a; 1979b.

**MARZAMEMI J**

**678**

Map 11

Italy

36° 45' N. 15° 8' E. Closely SW. of wreck E. Depth: 7-8 m.

No cargo. 5th-7th centuries AD.

A few amphora fragments, scattered on a shallow rocky bottom, appear to indicate the wreck-site of a ship whose cargo has disappeared. The amphoras are of various Byzantine types, not closely attributable. Some small boulders found at the site may have been ballast, though they were too few to indicate that the ship had been sailing empty; her cargo must therefore have disintegrated completely or been salvaged. Study of the 'ballast' stones failed to indicate an exotic source.

McWilliams et al., 1977.

**MARZAMEMI K**

**679**

Map 11

Italy

36° 44' N. 15° 9' E. In open water, about 500 m E. of wreck B. Depth: 26-28 m.

Amphoras (?). 5th-7th centuries AD.

A small number of broken amphoras were found concreted to a fissured rocky outcrop surrounded by sand. Study of the site failed to find any more cargo, or traces of the ship, though excavations in the sand might reveal more.

McWilliams et al., 1977.

**MASA D'OR, LA**

**680**

Map 4

Spain

42° 19' N. 3 18' E. (approx.). Off the E. point of Cap de Creus; also known as Cadaqués, Freu de la Clavaguera or L'Encalladora. Depth: 22 m (?).

Amphoras.

c. 100-25 BC (?).

A shipwreck with a cargo of Dr. 1B and Lam. 2 amphoras is known to exist at La Masa d'Or, though only vague information has been published.

Oliva, 1961: 237-41; Foerster & Pascual, 1973: 292; Pascual, 1981: 234; Nieto, 1986: 82.

**MATALA**

**681**

Map 13

Greece

34° 59' N. 24° 45' E. Just N. of the bay of Matala (S. Crete). Depth: 8 m.

Amphoras.

c. 50 BC-AD 110 (?).

An insubstantial report of the site does not provide adequate information to determine how many wrecks (if any) were found. The remains are described as three heaps of ballast-stones, together with amphoras; an amphora which is illustrated appears to be of form Schoene 8, perhaps of local origin.

Grile and Davaras, 1963: 43-9.

**Mataró - Els Capets (Spain)**

A decorated S. Gaulish terra sigillata bowl in the style of CRVCVRO (late 1st-early 2nd century AD) was brought up by fishermen from 70 m depth at Els Capets, NE. of Mataro; this may represent a wreck, but nothing else is known of it.

Pascual, 1981: 246-7; see also Miró, 1980.

**MATEILLE A**

**682**

Map 4

France

43° 7' N. 3° 7' E. At Gruissan (Solier et al., fig. 6, point 7); found in dredging the S. part of a new lagoon which occupies part of the former Étang de Mateille. Depth: 3 m.

Iron ingots, metal objects and amphoras.

c. AD 400-425.

Although only dumped spoil is known from this site, the homogeneity of the amphoras shows it was certainly a wreck. The amphoras were of forms Almagro 51A, pear-shaped (cf. Almagro 51C), and cylindrical of uncertain type; there were also some of a form not positively identified (owing to the absence of

complete bodies), but either Dr. 23 or cylindrical. This assemblage can be compared with Les Catalans, though in this case the date is fixed firmly in the 5th century. The Mateille amphoras were pitched internally. The cargo had included many small iron bars (only 13-21 cm long), hammered into roughly trapezoidal shape. These proved difficult to recover, but had originally been present in sufficient number to form extensive concretions and iron salts on the other material. There were also many bronze objects, including a large female statue (lost), animal terminals from furniture, part of a boar's tusk decoration, pendants, dishes, pots, and various other bits and pieces. It was not possible to decide whether all this material had been scrap, but that seems likely.

The wreck also produced hundreds of coins; of these, 551 were seen, but only a small proportion were legible. They begin with pre-Roman Gaulish coins, but conclude with many 4 of Theodosius, indicating a date in the first quarter of the 5th century AD. Other finds include three lamps of African ('Christian') type, t.s. chiara D of various forms, some coarseware and a vaulting tube. Parallels for the lamps, as for the cargo amphoras, suggest a date in the mid-late 4th century; the red-gloss pottery, however, like the coins, places the wreck in the first part of the 5th century. Some iron objects which could have been ship's equipment were a blade, an axe, and something which might have been a roughout for an anchor shank. There was also a bar, 39 cm long, which could perhaps be an ingot rather than a piece of equipment. There were also some lead fishing-weights. Quantities of volcanic stone, shown to be associated by iron deposits, must have been ballast.

It is very fortunate that, despite the site's destruction, enough survived from this late Roman wreck to illuminate an interesting period of trade.

Solier et al., 1981: 176-223.

#### **MATEILLE B**

683

Map 4

France

43° 7' N. 3° 7' E. At Gruissan (Solier et al., fig 6, point 8); on the NW. side of the new lagoon which occupies part of the former Étang de Mateille. Depth: 3-4 m.

Amphoras.

1st century AD.

This site, disturbed by dredging, was examined under water. The cargo was of Dr. 7-11 amphoras, probably made in E. or NE. Spain; one preserved part of a painted inscription. Fragments of the ship showed that she had been built normally, using treenails and copper nails; on the planking, no trace of lead sheathing was found, though the strakes were pitched both inside and out. It appears that most of the ship survived the dredger, and still lies beneath a bank of sand.

Solier et al., 1981: 224-7.

#### **'Mateille C'**

Various material found at Mateille comes, not from a wreck, but from rubbish deposits of the 1st century BC to the 4th century AD (Solier et al., 1981: 227-53).

**MEDAS A** **684** Map 4 Spain

42° 2' N. 3° 13' E. At the Medas (Medes) islands (Catalonia); at Punta del Guix. Depth not reported.

Amphoras (?). c. 125-75 BC (?).

A Dr. 1A amphora, full of untreated pine resin, came (according to R. Pascual) from a probable wreck. Other finds, such as a sounding-lead, cannot be regarded as definitely associated.

Pascual, 1962c; cf. Foerster, 1971.

**MEDAS B** **685** Map 5 Spain

42° 2' N. 3° 13' E. (approx.). Location and depth not reported.

Amphoras. c. 50 BC-AD 25 (?).

A looted cargo of Pascual 1 amphoras exists at the islands, though no details of the site have been published.

Nieto, 1987; but cf. Liou, 1987b: 271.

**MÈDES A, LES** **686** Map 5 France

43° 1' N. 6° 14' E. 220 m E. of Cap des Mèdes, Porquerolles island. Depth: 29 m.

Iron bars. 1st century BC ?

A cargo of iron bars had been reduced to a mass of concretion measuring 18.2 x 6.0 m; the bars had apparently been of square section, 30 or 55 mm square. The cargo preserved the shape of the bottom of the ship's pump, a rectangular void; on it lay a lead tank and two lead pipes, the remains of the deck-level exhaust system. A cylindrical piece of wood, found in another part of the site, could also have been part of this or another pump. Roof tiles and wood fragments were observed, as well as some rings of lead and bronze, a jug, and some amphora fragments (possibly 1st century BC). Beneath the iron concretion were found two tin ingots, of oval form, weighing 32 and 30 kg; each was stamped **CVM** and **MN**.

Tchernia, 1969: 476-8; Dumas, 1972; Corsi-Sciallano & Liou, 1985: 62.

**MÈDES B, LES** **687** Map 5 France

43° 1' N. 6° 14' E. On the N. end of Cap des Mèdes; at the foot of a steep cliff. Depth: 18 m.

Tiles. 1st century AD.

A cargo of tiles, shattered on the rocks, lay scattered for an extent of 20 m. The tiles were tegulae, of standard form, with signatures but no stamps; the clay resembles that of bricks made in the Toulouse/Haute-Garonne area. From the site came the foot of a Dr. 2-4 amphora, stamped **OR**; though this amphora (probably of S. Gaulish or Tarraconensian origin) cannot be definitely associated with the tile, since the site is scattered and contaminated with later material, its presence justifies a 1st-century date.

Benoit, 1962: 169; Dumas, 1972: 148.

Information: F. Carrazé.

**'MEDITERRANEAN'**

**688**

Map 1

-

Location unknown - somewhere in the Mediterranean, probably the western part.

Cargo unknown.

AD 308.

A hoard of gold coins was shown to numismatists in several batches between 1958 and 1966. Nothing is known of its provenance, except it was a wreck somewhere in the Mediterranean; internal evidence indicates the western part, and Sardinia or Sicily have been suggested as find-spots, but without proof. The coins, mostly aurei but also of larger size ('multiples'), must have belonged to an important person, and the latest pieces were probably part of an imperial distribution, perhaps given by Maxentius when he assumed the consulship in April 308.

Lafaurie, 1958: 82; Carson, 1980.

**MEGADIM A**

**689**

Map 14

Israel

32° 43' N. 34° 56' E. Off Nahal Megadim, near 'Atlit; detailed location and depth not reported. In shallow water.

Metal objects, including copper ingots.

c. 140-130 BC (?).

Scattered over an area 100 x 50 m were the remains of a Hellenistic metal-worker's tools and stock. The ship's hull did not survive, but copper nails indicated that this was indeed a shipwreck site. Two neckless amphoras had been used as containers for miscellaneous items, including bronze bracelets in various stages of manufacture, arrowheads, gilded balance-plates, gold diadem leaves, and silversmith's tools. Also on board were some copper bar ingots, marked with Greek letters, and two circular tin ingots (approx. 18 cm across). Some cinnabar was also found. There were also many fragments of lifesize bronze statues (both humans and animals), other decorative items of bronze and silver, and silver coins of Ptolemaic (Cyprus) and Seleucid mints, the latest dating to the 130s BC. Other finds included a basalt bowl and a sounding lead (marked on the plan, but not mentioned in the text by Raban & Galili).

Wardle, 1984; Raban & Galili, 1985: 353-5.

Information: E. Galili.

**MEGADIM B****690**

Map 14

Israel

32° 43' N. 34° 56' E. Near wreck A. In shallow water.

Coins, etc.

AD 1404 (or shortly after).

Several hundred thousand coins, weighing half a ton, lay in ten large clumps, representing the baskets in which they were originally packed. The coins, nearly all of Syrian mints, were mostly Mameluke, of Sultan Nasser Farage, AD 1399-1412; a small number of Ottoman coins included one which can be dated AD 1404. Also found at the site were the hinges of (now vanished) wooden chests; there was no clue to what these had contained. Around the clumps of coins were scattered bronze torches, copper lamps, inscribed bronze plaques, copper dishes (containing the remains of carobs), mortars and pestles, and what were once sacks of iron nails. Two mill-stones were found, and perhaps represent ballast. A fragment of the ship's hull, comprising planking and frames, fastened with iron nails, was preserved.

Wardle, 1984; Raban & Galili, 1985: 353-5.

**MELLIEHA****691**

Map 12

Malta

35° 58' N. 14° 22' E. In the bay of Mellieħa, by a rock which rises to the surface. Depth: 9 m.

Mortaria, glass vessels, and other cargo.

c. AD 200-250.

A scattered wreck, buried in sand and sea-grass, was extensively (but perhaps not completely) excavated by H. Frost in 1967. The main cargo comprised large mortaria, unstamped, possibly from Syria; there was also a group of glass vessels which may have been packed in a box, sealed with lead seals. A substantial group of amphoras included several of Kapitān 1 and other forms, of Greek origin. Some of these had contained rosin, and the excavator suggests that the amphoras had been collected, perhaps second-hand, to carry this cargo. Cakes of glass, blue frit, fragments of textile, and tin-alloy measures (perhaps used to pack the blue frit) were probably also cargo. The mortarium grits and some features of the glass (including its antimony content) suggest a European source, and perhaps Aquileia (rather than southern Italy, as proposed by the excavator) is indicated.

Roof-tiles and domestic pottery from the ship's living area were found, and also some ballast-stones, but only a single timber (of soft-wood, with iron nails). Other finds included fragments of two bronze vessels, and several bones, teeth and seeds. A treenail has subsequently been found. It is possible that some of these items do not belong to the wreck: the possibility of contamination is admitted by Frost (1969: 22). Other ancient material, including lead sheathing, an amphora stamped **A**, and black-gloss pottery, has been reported from elsewhere in Mellieħa bay, and there may be more than one wreck, or anchorage material, at or near the site (cf. Frost, p. 8). However, the pottery, amphoras and glass are a consistent 3rd-century group, comparable with finds from the Ostia excavations, though no comparable mortaria of this period were found there. Hopefully, further study of the site and its material will clarify this question.

Frost, 1969; Harden, 1973; cf. Parker, 1981b: 322-3.

Information: S.S. Frere; anonymous informants.

### **Meloria (Italy)**

A hoard of 4,000 bronze coins, mostly of Constantine II (AD 346-61), contained in a small amphora, was trawled up off La Meloria (Livorno) in 1965. There is no evidence they came from a wreck.

Fasti Archaeologici 18-19 for 1963-4, 794 no. 11901.

**MERSEA** 692 Map 15 Britain

51° 48' N. 1° 2' E. In Brightlingsea Reach, the estuary of the R. Colne, E. of Mersea Island. Depth not reported.

Pottery. Roman period.

No details are known of an estuary site which has produced Roman coarse-ware.

Unpublished.

Information: M.R. Eddy (from B. Clark).

**METHONE A** 693 Map 1 Greece

36° 49' N. 21° 42' E. Near Methone (Peloponnese); detailed location not reported. Depth: shallow.

Amphoras (?). Classical-Hellenistic period.

A badly broken-up wreck in shallow water has been only summarily reported. Throckmorton & Bullitt, 1963.

**METHONE B** 694 Map 1 Greece

36° 49' N. 21° 42' E. Near Methone; on a muddy bottom. Depth: 30 m.

Amphoras. Medieval.

Medieval jars and ballast-stones are reported only briefly from this site. Throckmorton & Bullitt, 1963.

**METHONE C** 695 Map 1 Greece

36° 49' N. 21° 42' E. On a rocky bottom. Depth: 9-10 m.



Marble columns and amphoras. c. AD 200-250.

Twenty fragments of columns, of granite originating probably from Egypt (possibly from Greece), lay scattered over an area approx. 30 x 20 m; a further six columns lay 60 m S. of the main site. The columns apparently came from a ruined building and were being transported for re-use. The total weight is calculated at 131.5 tonnes. Fragments of at least ten identical amphoras were found; these may have formed part of the cargo. The excavators' description suggests that the amphoras were of form Kapitän 2, presumably 3rd century AD. A fragment of glass of 3rd century date was also found.

Throckmorton & Bullitt, 1963; Bass, 1966: 97-8; Throckmorton, 1969b.

Information: P. Throckmorton.

**METHONE D** **696** Map 1 Greece

36° 49' N. 21° 42' E. 'Methone G' of Throckmorton & Bullitt. Depth: shallow.

Sarcophagi. 2nd-3rd centuries AD.

Four unfinished garland sarcophagi of Assos stone (the 'lapis sarcophagus' from the Troad) lay, with their lids, jumbled on rocks. There were also some small, water-worn stones which may have been ballast, some roof-tiles, pottery, and a glass unguent-jar.

Throckmorton & Bullitt, 1963; Bass, 1966: 98-100; Ward-Perkins, 1969: 129.

**MIKHMORET** **697** Map 14 Israel

32° 24' N. 34° 52' E. Near Hadera; details of location, etc., unknown.

Storage jars. Roman-Byzantine periods.

'An important cargo' of Roman or Byzantine jars is known to lie off Mikhmoret.

Unpublished.

Information: M. Prausnitz.

**MILADOU, LE** **698** Map 5 France

43° 0' N. 6° 23' E. Off the NW. part of Port-Cros island; depth not reported.

Cargo not reported. Roman period (?).

A wreck with remains of pump tubing (presumably Roman) has been summarily reported off Port-Cros.

Long & Ximénès, 1988: 182.

**MILAZZO****699**

Map 11

Italy

38° 16' N. 15° 13' E. (approx.). Off Capo di Milazzo, Punta S. Antonio (Sicily); detailed location and depth unknown.

Amphoras. c. AD 350-375 (?).

A late Roman amphora in the Museo Eoliano, Lipari, was brought from Capo di Milazzo by the Club Méditerranée in 1961; this most likely means there was a wreck there, though no independent corroboration is known.

Unpublished.

**MINAT MISHRAFA****700**

Map 14

Israel

33° 3' N. 35° 6' E. (approx.). The site is reported to lie N. of Akhziv; detailed location unknown.

Amphoras. 2nd-1st centuries BC (?).

A late Hellenistic wreck has been reported from Minat Mushrafa, without further details.

Unpublished.

Information: M. Prausnitz.

Minorca: see **Addaya, Binisafuller, Cala Vellana, Favaritx, Lazaret.**

**MIRAMAR****701**

(Not mapped)

Morocco

34° 0' N. 6° 51' W. On the Atlantic coast of Morocco, 10 km from Rabat; 3 miles off shore. Depth: 35 m.

Amphoras. Mid-late 1st century BC (?).

A relatively coherent wreck of ovoidal amphoras was found in 1973 or 1974 but not relocated. The amphoras were probably of local manufacture, and parallels suggest an approximate date. Also found, but not raised, were part of a coarseware jar and a marble slab.

Boube, 1979-80.

**MLIN****702**

Map 8

Croatia

43° 27' 16° 14' E. Near Mlini rock (Plični Mlin), between Čiovo and Šolta islands; depth not reported.

Amphoras. 1st-2nd centuries AD (?).

A wreck with Dr. 2-4 and pearshape amphoras of Italian type has been briefly reported. See also **Ilovik** and **Krava**.

Cambi, 1989: 323-5.

**MLJET A**                                      **703**                                      Map 1                                      Croatia

42° 43' N. 17° 41' E. In a small bay S. of Cape Stob, in the SE. part of Mljet island; 20 m from shore. Depth: 6-25 m.

Amphoras and glass vessels.              c. AD 850-1000.

The site had been looted prior to an archaeological survey in 1975, though records of looted material have also been traced. No remains of the ship survived; amphoras (at least 30 complete, plus fragments) and glass were scattered on a rocky slope. The glass vessels were mostly bowls and cups, with some flasks and goblets; parallels are known from both Arab and Byzantine sites of the mid 9th to mid 10th centuries AD. The amphoras are paralleled in Constantinople and the Black Sea region. The ship was possibly en route from Constantinople to a port in Byzantine Dalmatia or the Kingdom of Croatia.

Han & Brusić, 1978; Brusić, 1979.

**MLJET B**                                      **704**                                      Map 1                                      Croatia

42° 48' N. 17° 21' E. (approx.). At the NW. end of Mljet; depth not reported.

Amphoras and pottery.                      1st-2nd centuries AD (?).

At an un-named site off Mljet lies a cargo of Dr. 21/22 amphoras and pottery described as rather coarse, red plates and platters, thought to be from S. Italy. Similar pottery was found at **Gušteranski** and **Palagruža B** wrecks.

Orlić & Jurisić, 1987c.

**Moines, Les (France)**

At Les Moines, NW. of Bonifacio (Corsica), an isolated lead ingot and fragments of amphoras including a Lam. 2 were found in 18 m depth; no independent evidence corroborated the existence of a wreck in which this material might have been associated.

Domergue et al., 1974: 123.

**MOLA**                                      **705**                                      Map 7                                      Italy

42° 45' N. 10° 24' E. Near Porto Azzurro (Elba). Depth: 20 m.

Pottery pipes.                              1st century BC-AD (?).

A cargo of water-pipes has been briefly reported. No details of the pipes are given, but, since it appears they are large enough for octopus to inhabit, they are presumably normal Roman pipes, and the published date estimate of 1st century BC-AD is reasonable.

Zecchini, 1971: 121-2 & 187; cf. Gianfrotta & Pomey, 1981: 222-3 ('1st century AD'). The site is reported as at Punta Perla by G. Monaco (Fasti Archaeologici 17, 1962: 339, no. 4898) and is not mentioned by Zecchini, 1982.

**MOLÀRA**

**706**

Map 6

Italy

40° 51' N. 9° 44' E. Off Molàra island (Sardinia); detailed location and depth not reported.

Amphoras.

2nd century BC-1st century AD ?

A large quantity of amphoras, reported from Molàra island, no doubt represents a wreck. The amphoras have not been identified. Also found was a lead anchor-stock, inscribed **PVVVID.C**; this should be late Republican or early Imperial in date, and, if it is associated, dates the wreck.

Boninu, 1986: 60.

**MOLAT**

**707**

Map 8

Croatia

44° 12' N. 14° 51' E. (approx.). Off Molat; detailed location and depth not reported.

Amphoras.

1st century BC-1st century AD.

A wreck with Lam. 2 or Dr. 6 amphoras has been summarily reported.

Brusic, 1980: 159.

**MONACO A**

**708**

Map 5

Monaco

43° 44' N. 7° 25' E. In the SW. corner of Monaco harbour. Depth: 3 m.

Amphoras.

c. AD 200-250 (?).

A Roman wreck, still laden with some of its amphora cargo, was discovered in the harbour in 1948, and salvaged in 1965. The cargo amphoras comprised pear-shaped amphoras, probably Mauretanian, and Afr. 2A amphoras from Africa Proconsularis. Both types bore a variety of stamps and graffiti; no evidence of the contents was found. Shipboard pottery included both coarseware and t.s. chiara: the only illustrated piece of the latter is of Hayes form RS 27, dated by him AD 160-220. A coin, found in 1962, is said to have been an 2 of Marcus Aurelius (AD 161-180). Other pottery from the site, however, is likely to be c. AD 220-230 or even later. An inscribed wooden stamp, of the type used to stamp amphora seals, is ascribed to this site by Raymond & Dugand; the inscription reads **CAF** between palmettes.

Over 8 m of the keel was preserved; it was assembled from pieces 4-5 m

long, with joints pierced by treenails. Treenails were used (on their own) to fasten the frames to the planking, as well as for the planking tenons. Frames alternated with floors (at any rate, in the central part of the ship); the ceiling was fixed with bronze nails. The outside of the hull was covered with pitch, but not lead. Other features, reported in earlier accounts, were not found in the 1965 excavation; these included a rivet through one of the keel joints, and bronze nails to help pin the garboard strake to the keel. The ship is estimated to have been not more than 15 x 4 m, though she may in fact have been bigger; the flatness of the bottom amidships may possibly indicate she was an oared galley.

Mouchot, 1968-9; Reymond & Dugand, 1970; Panella, 1974: 584; Laubenheimer, 1985: 391.

**MONACO B** **709** Map 5 Monaco

43° 44' N. 7° 25' E. (approx.). Said to be near St Nicolas rocks, off the coast of Monaco. Depth: 40 m (?).

Amphoras. c. 150 BC (?).

The wreck was first reported when (in 1949) a helmet diver found a bronze panther (with red copper inlaid spots). According to Benoit, there was no evidence for hull or cargo in the area of the find, but Reymond & Dugand report that divers have located the wreck and raised an amphora of late Graeco-Italic/Dr. 1 form. Diolé mentions a ship's lantern from the spot where the panther was found.

Benoit, 1952b: 265-6 (with illustration); Diolé, 1954: 106-8; Reymond & Dugand, 1970: 175.

**MONACO C** **710** Map 5 Monaco

43° 44' N. 7° 25' E. (approx.). On the Plateau St Nicolas. Depth unknown.

Amphoras. c. 100-25 BC.

A lead horn and three ovoid amphoras were reported by Benoit; a Lam. 2 amphora from the wreck was later published by Fiori.

Benoit, 1962: 173; Fiori, 1972b: photo 1.

**MONACO D** **711** Map 5 Monaco

43° 44' N. 7° 25' E. (approx.). Said to be opposite the rifle-range. Depth unknown.

Amphoras. c. 150 BC (?).

The only published reference to this wreck describes the cargo as comprising Graeco-Italic amphoras with curved body and sloping rim; these are per-

haps late Graeco-Italic or transitional to Dr. 1. Both parts of a basalt hand-mill were also found.

Benoit, 1962: 173.

**MONATE, LAGO DI** 712 Map 7 Italy

44° N. 8° E. One of several dugouts found in L. Monate has been dated by  $C_{14}$  to the Roman period, ad 130~~±~~50.

Radiocarbon, 18 (1976): 322; McGrail, 1978: 112.

**MONFALCONE** 713 Map 8 Italy

45° 49' N. 13° 32' E. Found under silt close to a Roman building complex near Monfalcone (Veneto).

No cargo. 1st century AD.

Only a preliminary report has been published of a Roman boat excavated in 1972. The bottom was preserved, measuring 11 x 3.8 m; it was rather flat in section, with a shallow keel and a long keelson. Thirty-four frames were preserved. The keel and keelson were of oak, the planking of fir, and the frames of walnut. The hull was assembled with wooden fastenings. Finds from inside the hull included a jug, plates and cups, datable to the 1st century AD, as well as some grapes in a wooden container, and a wicker basket. Unfortunately there are no drawings or detailed description of this interesting find. The boat was raised and taken to Aquileia in 1974.

Bertacchi, 1976.

**MONT ROSE** 714 Map 5 France

43° 14' N. 5° 20' E. South of Marseilles, near La Madrague-de-Montredon. Depth: 31 m.

Amphoras. c. 200-150 BC.

The cargo comprised Graeco-Italic amphoras of many varieties of shape. Also found was a black-gloss cup with a Greek graffito.

Liou, 1975: 582-3.

**MONTECRISTO A** 715 Map 7 Italy

42° 21' N. 10° 17' E. Off Cala del Diavolo, on the N. side of Montecristo (Tuscan Islands). Depth: approx. 70 m.

Amphoras and pottery. c. 260-250 BC.

A cargo of Graeco-Italic amphoras, of both whole and half size, lies in deep water. There was also a consignment of black-gloss ware, comprising cups with rosette stamps, matched by material from a kiln at Minturnae in Latium, and datable just before the middle of the 3rd century BC. An iron anchor was also found, with a coarseware jar and a mixing-bowl concreted to it. The cargo presumably comprised Falernian wine, together with the appropriate drinking-vessels, and is an interesting document of the early Italian wine trade.

Gianfrotta & Pomey, 1981: 306-7; Maggiani, A. in Martelli *et al.*, 1982: 65-8; cf. Zecchini, 1971: 105 & 198, reporting scattered Roman pottery.

**MONTECRISTO B** 716 Map 7 Italy

42° 20' N. 10° 17' E. Off Cala Maestra, on the W. side of Montecristo. Depth unknown.

Cargo unknown. 15th century AD.

Only a summary reference has been published to a medieval wreck off Montecristo.

Zecchini, 1971: 105-7 & 198.

**MONTECRISTO C** 717 Map 7 Italy

42° 20' N. 10° 17' E. Off Cala Maestra. Depth: 75 m.

Amphoras. Roman period.

An unexplored Roman wreck has been only summarily reported.

Zecchini, 1971: 105 & 198.

**MONTECRISTO D** 718 Map 7 Italy

42° 20' N. 10° 17' E. Off Cala Maestra. Depth: 55 m.

Pithoi and jars. 6th century BC (?).

Three pithoi are known from this site; one was brought up by a fisherman in 1970, another was raised by divers in 1974, and a third was left on the seabed. The dolium raised in 1974 was said to have been found in the middle of a deposit of Roman amphoras, but the illustrated material is Etruscan. There are four large jars with wide neck and flat base, a large pitcher, an amphora neck and a large lid. The dolium is said by Gandolfi to be Roman, probably of imperial date, as are (by implication) the amphoras. A Roman dolium brought up by fishermen in 1970 approx. 24 miles S. of Montecristo is illustrated by Ceccanti. None the less, the initial report of an Etruscan wreck seems to stand, even though its true nature may never be established.

Bolzoni, 1974; Gandolfi, 1982: 404; Ceccanti, M. in Martelli *et al.*, 1982: 64-5; Gianfrotta & Hesnard, 1987: 291, n. 39.

Information: G. Kapitān.

**MONTECRISTO E**                                 **719**                     Map 7                     -

42° 1' N. 10° 1' E. (approx.). Material brought up in nets, 17 miles SW. of Montecristo. Depth: approx. 91 m.

Amphoras.   c. 100-25 BC (?).

A fisherman's haul of five Dr. 1B amphoras, reportedly found together with a Dr. 30, must represent a 1st century BC shipwreck in deep water.

Ceccanti, M. in Martelli et al., 1982: 64-5.

**MONTECRISTO F**                                 **720**                     Map 7                     Italy

42° 21' N. 10° 17' E. Near Punta del Diavolo; buried in sand, on a slope. Depth: 45-55 m.

Amphoras.   c. AD 50-250 (?).

A wreck of pear-shaped amphoras, apparently of Gallic origin and of two varieties, first discovered in 1977, was surveyed by M. Bound in 1985-6. A jug was also found, and some bronze nails.

Bound, 1988b.

Information: M. Bound.

Moro Boti: see **Cabrera D.**

**MOROVNIK**   **721**                     Map 8                     Croatia

44° 25' N. 14° 44' E. On the E. side of Morovnik islet, off the N. end of Olib; depth not reported.

Amphoras.   c. AD 300-425 (?).

A wreck of African amphoras (probably cylindrical) has been briefly reported.

Brusić, 1980: 162 & 166.

**MORTORIUS, IS**                                 **722**                     Map 6                     Italy

39° 11' N. 9° 19' E. At Is Mortorius (Torre Mortorio), near Quartu S. Elena (Sardinia). Exact location and depth unknown.



Amphoras. c. AD 30-55 (?).

A collection of 15 amphoras, confiscated from looters, came from an unlocated site. Most were of Camulodunum 186 form, with some of Dr. 7-11 and Haltern 70, and (apparently) a Dr. 1C. All or most of these amphoras must be from a wreck of the first half of the 1st century AD, cf. **Sud-Lavezzi B** or **Tour Sainte Marie A**.

Pianu, 1981.

Motya: see **Isola Lunga, Marsala, Punta Scario**.

**MUNXAR** 723 Map 12 Malta

35° 50' N. 14° 34' E. In the vicinity of Munxar Point. Depth unknown.

Amphoras. Roman period.

A wreck of 'Spanish-Roman' amphoras was located (without further details) east of Munxar Point in a report by Scicluna. Other information suggests the site may be closer in.

Scicluna, 1965; Parker, 1976: fig. 1, no. 7.

**MURELLE, LE** 724 Map 7 Italy

42° 18' N. 11° 35' E. At Marina di Montalto (Viterbo); by the S. side of the breakwater of the harbour of Le Murrelle (or, Punta Morelle). Depth: 2-3 m.

Amphoras. c. 300-250 BC (?).

A mass of broken amphoras, measuring approx. 23 x 5 m, was made up entirely of early Graeco-Italic amphoras. Although no traces of a ship were found, it is reasonable to interpret the deposit as the remains of a broken-up cargo.

Incitti, 1986: 195-8.

**MURTER** 725 Map 8 Croatia

43° 48' N. 15° 32' E. (approx.). At an unstated site off Murter, probably on the W. side. Depth: 27 m.

Amphoras and pitch. c. 150-1 BC (?).

A wreck with Lam. 2 amphoras has been briefly reported. As well as amphoras there were blocks of pitch, a pile of ballast stones, and some pottery; the ship's hull was preserved, under sand.

Orlić & Jurisić, 1986b: 50.

**NAPOLI** 726 Map 9 Italy

40° 30' N. 14° 15' (?). At an unknown location off Naples.

Amphoras. c. AD 200-250 (?).

An amphora of Afr. 1 form in Naples Museum is said to have come from a wreck.

Panella, 1974: 578.

**NAREGNO** 727 Map 7 Italy

42° 45' N. 10° 24' E. Off the beach of Contrada Naregno (Elba). Depth: 6-7 m.

Amphoras. 3rd-4th centuries AD.

Amphoras of African type, from a probable wreck, were raised from off the beach in 1967.

Pallarés, 1983b: 184, no. 47 (citing G. Brambilla, and spelling name Nargeno).

**NAU PERDUDA, SA** 728 Map 4 Spain

41° 57' N. 3° 13' E. On the N. side of Cape Bagur in NE. Spain; scattered among rocks. Depth: 28-30 m.

Amphoras. c. 60-40 BC.

Discovered in 1962, the site was excavated under the leadership of F. Foerster (1962-9) and a full report published. The main cargo comprised Lam. 2 and similar amphoras, several Dr. 1B, and some Apulian amphoras; all were lined with rosin. An amphora similar to Lam. 2 is stamped **APO**, and a Lam. 2 bears a graffito, **ERM(ES) Q(VINTI) S( ) S(ERVVS)**, incised twice before firing. This was presumably a wine cargo. Four pairs of hand-mill stones were found, and these must also have been part of the cargo.

Three lead anchor-stocks and a sounding-lead were found together (i.e. at the bow); there were also two iron axes and a square-section bar (perhaps a chisel or cold-chisel). A small amphora and fragments of black-gloss pottery and 'Ampuritan Grey' ware were for shipboard use. Some roof-tiles were found, though scarcely enough to make a roof. Some pieces of lead tubing were found, three 50 cm long and one 1 m long, presumably from the bilge-pump. A few pieces of wood were found, including a plank and a wale; they are of Maritime pine (*Pinus pinaster*). There were also some iron nail concretions. The thickness of the timbers suggests a small ship, and this is confirmed by the spread of cargo, which is not more than 20 m. Only 76 amphoras were raised in excavations, but more may have rolled away down the slope or been removed by other people.

Foerster & Pascual, 1973; cf. Parker, 1980.

**NAVPLION A** 729 Map 13 Greece

37° 34' N. 22° 48' E. NE. of Tolón island, near Návrplion (Nauplia); on the mainland shore. Depth: shallow.

Grinding-stones. 5th-4th centuries BC.

A cargo of hopper-mills (as found, for instance, at El Sec) appears to be of classical date. A pottery bowl is also said to have been found on the wreck.

Unpublished.

Information: J. Toudup; G. Kapitán.

**NAVPLION B** 730 Map 13 Greece

37° 34' N. 22° 48' E. Said to be on the 'secca' of Tolón; exact location and depth not known.

Storage jars. 13th-15th centuries AD.

A wreck of 'pithoi' near Navplion is thought to be of medieval or Renaissance date.

Unpublished.

Information: G. Kapitán.

**NEGRES, LES** 731 Map 4 Spain

41° 58' N. 3° 14' E. Near Bagur (Gerona); the wreck lies in a valley in the reef of 'Roques Negres' or 'Les Negres', off Aiguafreda. Depth: 5-25 m.

Amphoras. Mid 2nd century AD.

The cargo forms a layer up to ½ m thick of amphoras of two forms, Beltrán 2B and Dr. 20. Although a considerable number of individual amphoras is represented, no stamps have been found. The profile of the Dr. 20 amphoras indicates a mid 2nd century date. No other material has been found.

A 'pecio de les Negres', with Lam. 2 amphoras, referred to by Beltrán (1970: 352) must be some other site, or a mistake.

Pascual, 1962b.

**NEMI A-D** 732-735 Map 9 Italy

41° 43' N. 12° 43' E. Ships found in L. Nemi. A and B have been known since 1446; they and the other two were removed from the drained lake in 1929, and subsequently destroyed by fire.

Nemi A (5-12 m deep) and B (15-21 m deep) were large pleasure-galleys, provided with fully decorated deck-houses, water-supply, etc. Many hull details were recorded in the excavation, including pumps (perhaps for fresh water) and other machinery. The ships were sheathed in lead. One had a keel formed from a

single timber, 36 m long.

Nemi C (depth not known) was a 5 m long barge, laden with tiles, which sank near the great ships. Nemi D was a 9 m long boat, found in the lake-shore. All four vessels were presumably of the period c. AD 35-50, though the date at which the great ships sank is not certain. Although the timbers of the ships have been mostly destroyed, at least some of the metal fittings survive (in private possession).

Ucelli, 1950; cf. Basch, 1972; Foerster, 1984.

**NEREZINE** 736 Map 8 Croatia

44° 39' N. 14° 24' E. Near Nerezine, on the NE. coast of Losinj; depth not reported.

Pottery. 2nd century AD (?).

Not much is known of the circumstances of discovery of a group of Roman pottery near Nerezine, but it seems likely to be from a wreck cargo like those of **Pakleni** and **Viganj**.

Istenić, 1988.

**NESEBER A** 737 Map 1 Bulgaria

42° 39' N. 27° 44' E. In Rabda bay, on the S. side of Neseber. Depth: 10 m.

Amphoras. c. 475-450 BC (?).

A cargo of Chian amphoras has been rather briefly investigated. The wreck, apparently fairly badly broken up, sank in water which was only approx. 6 m deep in the classical period. The cargo contained both types of Chian amphoras found in the mid 5th century BC (cf. Grace, 1961: figs 44-51). It is not certain whether anything of the ship survives. The wreck appears to show that there was direct contact between the Aegean and the Black Sea coasts at this period.

Oggenova, 1975; Velkov, 1986: 285, fig. 2.

Information: L. Oggenova.

**NESEBER B** 738 Map 1 Bulgaria

42° 39' N. 27° 44' E. (?). Near Neseber; detailed location and depth unknown.

Amphoras. c. AD 500-625 (?).

Fragments of several amphoras, found together in the sea, are thought to come from a wrecked cargo. There were bases with a knob, a globular amphora with wavy combed decoration, and a long handle, all typical of the 6th-7th centuries AD. One fragment bore a Greek graffito.

Bouzek & Kordač, 1963.

New County Hall: see **London (County Hall)**.

**NEWE YAM A** 739 Map 14 Israel

32° 41' N. 34° 56' E. On rocks at Newe Yam, S. of 'Atlit.

Amphoras. c. 400–350 BC.

The cargo is reported to comprise storage jars of the first half of the 4th century BC; no other details are known.

Unpublished.

Information: M. Prausnitz.

**NEWE YAM B** 740 Map 14 Israel

32° 41' N. 34° 56' E. Said to be close to wreck A.

Amphoras. Late Roman or Byzantine.

No details are known of this wreck.

Unpublished.

Information: M. Prausnitz.

**NEWE YAM C** 741 Map 14 Israel

32° 41' N. 34° 56' E. Near Newe Yam; 80–100 m off-shore. Depth: 3 m.

No cargo (?). 25th–19th centuries BC.

A group of 15 stone anchors (found in 1983) most likely represents a Middle Bronze Age wreck. No other material has been found.

Galili, 1985; cf. Frost, 1986a.

**NICE** 742 Map 5 France

43° 41' N. 7° 17' E. On the tip of Cap Nice; scattered down the cliff-face. Depth: down to 80 m.

Amphoras. 6th century BC.

An archaic Etruscan wreck has been reported from Cap Nice, but without details.

Benoit, 1960: 54; 1965a: 51; cf. Fonquerle, 1972: 56.

Nice: see also **Saint Hospice**.

**NICOTERA** 743 Map 1 Italy

38° 32' N. 15° 56' E. On the Secca di Joppolo, off Nicotera Marina. Depth not reported.

Stone. Late 1st century BC (?).

A survey project in the Nicotera area found some stone remains and other traces of a shipwreck. An anchor-stock and an Italian terra sigillata plate of the end of the 1st century BC were recovered. It is not reported whether the stone could have originated from the grey-white granite quarries of Nicotera Marina, which were worked in the Roman period.

Solano, 1985.

**NIN A & B** 744-745 Map 8 Croatia

44° 15' N. 15° 11' E. In the entrance of the harbour of Nin. Depth: shallow.

No cargo. c. AD 1050-1100.

Two ships were sunk, ballasted, to block the approach to Nin. They have been dated by C<sub>14</sub> to the second half of the 11th century AD. The first ship to be studied was 9 m long. The second, less well preserved, retained a mast-step, a hole at the top end of one of the ribs for making fast a shroud, and a rowlock. Both vessels were raised in 1974.

Brusić, 1969; 1978.

For Roman finds from near Nin, see **Zaton**.

**NIOLON** 746 Map 5 France

43° 20' N. 5° 15' E. In L'Estaque roads. Depth: 10 m.

Amphoras. 1st century AD (?).

An amphora, apparently of Dr. 2-4 form, raised from a scattered wreck near Niolon was full of pitch (derived from resinous wood); other finds comprised amphora stoppers (of fired clay), glass vessels, brail-rings and a sounding-lead. No further details have been published.

Benoit, 1960: 43; Gianfrotta & Pomey, 1981: 182.

**NOCE, FIUME** 747 Map 9 Italy

39° 55' N. 15° 45' E. At the mouth of the river Noce (Basilicata); detailed location and depth not reported.

Amphoras. c. 50 BC-AD 100 (?).

Only a preliminary notice has appeared of a wreck S. of Maratea. The amphoras are of form Dr. 2-4.

Subacqueo 18 no. 201 (Feb. 1990): 8.

**NORA** 748 Map 6 Italy

38° 58' N. 9° 1' E. (approx.). Site known only from looted material.

Amphoras. 4th century AD (?).

A cargo of Almagro 50 amphoras was repeatedly looted by a lone diver in the 1960s. Although he was several times seen bringing back his haul, the wreck-site could not be traced. The amphoras, by description, closely resembled those of **Randello**, and may likewise be of 4th century date.

Unpublished.

Information: W. St J. Wilkes.

#### **Nora: Roman amphoras**

A variety of Roman amphoras was found by W. St J. Wilkes's surveys off Nora; a photograph of a selection which was raised includes several Beltran 2B, pear-shaped, Afr. 2A, Afr. 2B-D and Kapitän 2 amphoras. Most of these came from the western harbour of Nora, where a similar range of forms has been found by the survey of M. Cassien. Some of the illustrated amphoras may have come from further south and east, off Coltellazzo, the headland of Capo di Pula, where an Africana 2A amphora was found by Cassien (1984: 21). While there is no reason to doubt that at least one Roman ship may have been wrecked off the headland, the makeup of its cargo is uncertain.

To avoid confusion, the probable Punic wrecks surveyed off Capo di Pula by Cassien are named **Coltellazzo**, q.v.

Macnamara & Wilkes, 1967: 11 & fig. 3; Wilkes, 1971: 199; Cassien, 1984: 11-16 & 21.

Information: W. St J. Wilkes.

**NORD-CAMARAT** 749 Map 5 France

43° 12' N. 6° 40' E. Off la Pointe de Bonne Terrasse. Depth: 23-25 m.

Tiles. 1st century AD (?).

What must be a cargo of roof-tiles lies deeply buried in sea-grass. The tiles, both tegulae and imbrices, are dark in colour, with sharp corners.

Joncheray, 1987a: 81-2; Pomey et al., 1989: 36 ('Camarat 1').

See also **Sud-Camarat**.

**NORD-LEVANT**

750

Map 5

France

43° 2' N. 6° 28' E. (approx.). Off Levant island; detailed location and depth not reported.

Amphoras. c. 300-150 BC (?).

A wreck with Graeco-Italic amphoras full of resin was recently discovered off Levant.

Unpublished.

Information: J-P. Joncheray.

Novi Vinodolski: see **Povile**.

**Nueva Tabarca (Spain)**

On the NE. side of the island of Nueva Tabarca or Isla Plana (Alicante) lies a 'field of amphoras', extending 350 x 150 m, in 2-4 m of water. Sketches suggest the amphoras include Dr. 1 or Dr. 2-4, Afr. 2B-D or Almagro 51A, and Dr. 20 or 23 forms. Some or all of this material must represent shipwrecked cargoes, but how many, and of what dates, one cannot say.

Belda, 1958.

**OBERSTIMM A & B**

751-752

Map 15

Germany

48° 45' N. 11° 31' E. (approx). On the W. side of Kastell Oberstimm, by a tributary of the R. Danube near Manching; under 2.45 m of silt.

No cargo. Early 2nd century AD.

Two Roman river ships, abandoned in a military harbour in the reign of Trajan or Hadrian, have been partially excavated and briefly reported. They were of Mediterranean style construction, rounded in cross-section and built shell-first, with mortice-and-tenon joints and inserted frames. The planks were of pine, the frames of oak; tree-ring dates from the oak timbers show the trees used were felled not earlier than AD 90 10 and AD 102 10. One preserves the seating for a rower's thwart on the outermost preserved strake. Measuring 3.0 and 2.8 m in beam (and of unknown length), these two vessels, like that at **Vechten**, represent the personnel transports or river patrol ships of the early Imperial frontier armies.

Hückmann, 1988: 395; Schönberger et al., 1988.



**OGNINA (CATANIA) A**

753

Map 11

Italy

37° 31' N. 15° 7' E. On a bottom of sand and rock, off Ognina in Catania province (Sicily). Depth: 28-37 m.

Amphoras. c. 150-25 BC.

Fifteen Lam. 2 amphoras and a lead reinforcement collar were recovered from an already looted wreck in 1969.

CNA Newsletter, 4 (July, 1970): 45.

Information: G. Kapitän.

**OGNINA (CATANIA) B**

754

Map 11

Italy

37° 31' N. 15° 7' E. Said to be near wreck A. No details are known.

Tiles. Date unknown.

No details are available of this cargo of roof-tiles.

Unpublished.

Information: G. Kapitän.

**OGNINA A**

755

Map 11

Italy

36° 58' N. 15° 16' E. On the reef off Capo d'Ognina, near Syracuse (Sicily); site Og-1 in Parker (1981b) fig. 12. Depth: 7-8 m.

Amphoras, etc. c. AD 215-230.

A substantial amphora wreck lay scattered on a rocky bottom with sand-filled pockets. The amphoras were mostly Afr. 1, together with Dr. 20, Beltrán 2B (?), pear-shaped, Kapitän 1 and 2, and other forms. One amphora appears to have contained blue frit. The ship was luxuriously furnished, presumably with a cabin for passengers. Fragments of a mosaic show that it was floored with a coloured, figurative design, surrounded by a black-and-white geometric border. Small marble columns with Corinthian capitals doubtless flanked a doorway. Statuettes of bronze (notably a satyr) and blue glass, glass vessels and other finds, testify an unusually high level of equipment on board. No timbers survive, but lead tubing has been found, as well as a group of four bronze pulley wheels. The wreck is dated by 18 or 19 coins, including issues of Perinthos, Smyrna and Byzantium; the hoard date is AD 210-215.

The interpretation of the more unusual finds has been controversial; obviously, some of the portable objects might have been passengers' belongings, but the mosaic and columns at least must have been part of the ship.

Kapitän, 1972b; 1973b; Kapitän & Price, 1974; Gargallo, 1972; Frost, 1973.

**OGNINA D**

756

Map 11

Italy

36° 58' N. 15° 16' E. Site Og-4 (cf. Parker, 1981b, fig. 12). On the reef of Ognina, S. of wreck A and site Og-3. Depth: 5-6 m.

Amphoras. 4th century BC.

The fragmentary remains of a cargo of Greek amphoras lay, scattered over an area 15 x 15 m, on a rocky shoal. The amphoras were of an unidentified type, found also at La **Madonnina**. Pieces of two pithoi, two louteria and several roof-tiles were also found. A pyramid-shaped stone anchor (also paralleled at La Madonnina) is thought to have been raised from this site in former years. No other material or precise dating evidence was found.

Kapitän & Naglschmid, 1982.

#### OGNINA WEST

757

Map 11

Italy

36° 58' N. 15° 16' E. Site OW/68 (Parker, 1981b, fig. 12). Inshore of the Ognina reef, to the W. of wreck A and the other sites here described. Depth: 4 m.

Amphoras. c. 100-25 BC (?).

A scattered deposit of broken amphoras included amphoras of form Lam. 2, and also some with double handles. This was probably the remains of a very poorly preserved shipwreck.

Squire et al., 1969.

#### Ognina: sites Og-2 and Og-3

Several ancient cargoes appear to be represented by finds of broken amphoras on the inshore side of the submerged reef of Ognina (cf. Parker, 1981b, fig 12). The following groups of material can be distinguished:

- I. Roman amphoras (Afr. 2B-D).
- II. Punic amphoras (Mañá Type C).
- III. Corinthian A and 'Ionian' amphoras (cf. Koehler, 1981: 453).
- IV. Byzantine amphoras.
- V. Double-handled (Dr. 2-4) amphoras.
- VI. Corinthian B amphoras.
- VII. Greek amphoras of 'Locrian' type.

The Roman numbers are those assigned by G. Kapitän. There is a locational distribution of material within the areas Og-2 and Og-3, though the deposits overlap. Pending a more detailed study of these sites, no attempt is here made to identify separate wrecks.

Information: G. Kapitän.

#### OLBIA A & B

758-759

Map 6

Italy

40 55' N. 9 30' E. In the harbour of Olbia (Sardinia); material recovered from excavations can be attributed to two wrecks. Depth: 3-4 m.

A. Amphoras. 2nd-1st centuries BC.

B. Amphoras. 4th-2nd centuries BC.

Excavations by the CSAS in the harbour area (1977-81) took place at two sites, over 150 m apart. Seventy-five amphoras were found, of which only 13 have been published; the reports do not make clear how many of each type there were, nor where they were found. The amphoras lay on sterile sand, and apparently underlay (but not in a different stratum) pottery and other objects dating from the mid 1st century BC to the end of the 1st century AD. The amphoras illustrated are Dr. 1A and 1C and Mañá C2b (2nd-1st centuries BC), Dr. 1B (1st century BC) and Mañá D and similar. Of the 'Mañá D' group, figs 6a, 6b, and 9 probably belong to the 3rd, 2nd and even 1st centuries BC respectively; fig.7 could perhaps be 2nd rather than 3rd century (cf. Lancel *et al.*, 1982: 171), though this is not confirmed by parallel finds from Sardinia. Some of the Punic amphoras contained hazelnuts, pine-nuts, and animal-bones (probably pig, sheep/goat and cattle).

While it is possible for some of these amphoras to be associated, they cannot all be. However, they are all (or nearly all) earlier than the pottery and other debris (doubtless rightly regarded by Pallarés and Gandolfi as harbour rubbish), which invites one to ascribe them to some other source.

Was there a single wreck at the site (proposed diffidently by Pallarés)? Objections: (1) the wide gap between the two excavated areas (2) the large spread of date (3) the absence of appropriate nautical material or shipboard pottery.

Were there two wrecks at the site (asserted confidently by Ferrandi)? Objections: (1) as far as one can tell from the site plans, all types of amphora were found in both areas (2) there is no obvious division of the amphoras into two chronological groups (3) as objection 3 above.

Was the material redeposited at the site in ancient or modern times? More information on quantities, and, of course, more discoveries on the site, might illuminate this. Pending such further information, I conclude there may have been two wrecks at or near the site in Olbia harbour.

Ferrandi, 1980; Pallarés, 1986c; Gandolfi, 1986c; Dell'Amico, 1986.

**OLIB A** 760 Map 8 Croatia

44° 20' N. 14° 48' E. (approx.). On the S. side of Olib; detailed location and depth not reported.

Amphoras. c. AD 300-425 (?).

A wreck of African amphoras (probably but not definitely cylindrical) has been summarily reported.

Brusić, 1980: 162.

**OLIB B** 761 Map 8 Croatia

44° 20' N. 14° 48' E. (?). Near the S. tip of Olib; detailed location and depth not reported.

Amphoras. c. AD 25-125 (?).

A wreck of Spanish amphoras, form Beltrán 2A, has been briefly reported.

Brusić, 1980: 162 [reading the ref. to Beltrán as pp 425 ff] and 163, fig. 3 [reading Olib for Silba in caption].

**OMIŠALJ** 762 Map 8 Croatia

45° 13' N. 14° 32' E. (approx.). In the bay of Omišalj (at the N. end of Krk island). Depth not reported.

Amphoras. c. 150-50 BC (?).

No detailed report has been published of this site. The cargo included amphoras of three kinds: two varieties of form Lam. 2, a related type (more egg-shaped), and what seems to be a Coan amphora of the late 2nd-early 1st century BC, rather than a Dr. 2-4.

Dautova-Ruševljan, 1970 (nos I. 1-2, II & III); Vrsalović, 1974: 53 & 240.

**OOZE DEEP** 763 Map 15 Britain

51° 29' N. 1° 0' E. In the Ooze (or Oaze) Deep, Thames Estuary; detailed location and depth not reported.

Mortaria. c. AD 65-105.

Nothing is known of a site from which came six mortaria, stamped **CAVARIVS**.

Dean, 1974.

**OPAT** 764 Map 8 Croatia

43° 44' N. 15° 28' E. At Opat point, the SE. point of Kornat island (q.v.). Detailed location and depth not reported.

Roof-tiles. Roman period.

A cargo of tiles (probably Roman) has been summarily reported.

Vrsalović, 1974: 53 & 240.

**ORISTANO** 765 Map 6 Italy

39° 51' N. 8° 25' E. (approx.). In the area of Oristano (Sardinia); detailed location and depth unknown.

Amphoras. c. 200-150 BC.

In Oristano Museum is a group of ten Graeco-Italic amphoras, identified by E.L. Will as of her type D, which must have come from a local wreck. The amphora illustrated resembles some from the wreck of **Mont Rose**.

Will, 1986: 212 & fig. 15.3.

**OSCELLUCIA** **766** Map 6 France

42° 34' N. 8° 43' E. At Ocellucia point, near Calvi (Corsica). Depth: 15-17 m.

Amphoras. c. AD 20-50.

The shattered cargo was made up of Dr. 20 amphoras of early type.

Tchernia, 1969: 494.

**OSTIA** **767** Map 9 Italy

41° 40' N. 12° 5' E. (approx.). From 10 miles off Ostia. Depth: 240 m.

Dolia. c. 50 BC-AD 50 (?).

Two dolia were landed from a place where several have been fished up, and which is most likely a wreck site. They are stamped (in a foot-shaped cartouche), one **ANTIOCVS** phallus | [**CA**]MIDI M.S.FECIT, the other [ ]NR CANNS[ ] (?).

Mocchegiani, 1986: 93; Gianfrotta & Hesnard, 1987: 287 & 296; Pellegrino & Petriaggi, 1988.

Ostia: see also **Fiumicino**.

**OSTUNI** **768** Map 10 Italy

40° 47' N. 17° 35' E. (approx.). Off Ostuni (Brindisi); detailed location not reported.

Pottery. 12th-13th centuries AD (?).

A brief report, with a photo of a painted dish, is all that has been published of this wreck.

Mondo Sommerso (June, 1973): 133.

**Otranto (Italy)**

Press reports of 'a very ancient warship, perhaps 10th-6th centuries BC' with a bronze ram, said to lie in 25 m off a nature reserve ('Le Cecine') at Otranto (Apulia), have no factual basis, it seems.

Gandolfi, 1985b: 661.

Information: G. Kapitán.

**OUEST DE PLANE** 769 Map 5 France

43° 11' N. 5° 22' E. Known as 'Ouest de Plane' or 'Calseraigne'. Depth: not reported.

Amphoras. c. 150-50 BC (?).

A wreck with amphoras of forms Dr. 1A, Dr. 1C and Lam. 2 has been summarily reported. Material from the site also includes fragments of a pear-shaped amphora, but this must be intrusive.

Carrazé, 1975: 37.

See also **Plane**.

**OVRAT** 770 Map 1 Croatia

42° 47' N. 17° 24' E. Said to be 'around Ovrat and Moracnik, near Mljet'; detailed location not reported.

Amphoras. 1st century AD.

Only a summary reference to this wreck has been published.

Vrsalović, 1974: 53 & 240.

**PAG** 771 Map 8 Croatia

44° 30' N. 15° 0' E. (approx.). In the area of Pag; detailed location and depth not reported.

Amphoras. 3rd century AD (?).

A wreck of Afr. 2A amphoras was reported at the 1976 International Congress of Underwater Archaeology, but has apparently not been published.

Information: R. Matejčić.

**PAG AREA** 772 Map 8 Croatia

44° N. 14° E. Between Pag and Baska; detailed location and depth not reported.

Amphoras. c. AD 275-300 (?).

A wreck of cylindrical amphoras was reported briefly in 1976, and has apparently not been published. This may be a doublet of another site, eg. **Scedro A**.

Information: R. Matejcic.

**PAKLENI** 773 Map 8 Croatia

43° 9' N. 16° 23' E. In the Pakleni islands (Italian: Isole Infernali), Hvar; at Izmetišće point, near Palmežan. Depth: 44 m.

Pottery. 2nd century AD.

Unusually, the cargo of this wreck was made up entirely of coarse pottery, estimated at 30,000 pieces originally. The material recovered includes one-handled beakers, jugs, two-handled jars and a one-handled jar, carinated bowls with handles, lids, flat dishes and a flat pan. There is no sign of use on any of the pottery, which was therefore probably a newly-made consignment; it is thought to have originated in Asia Minor. The dimensions of the pots can be related to the Roman system of measures. Timber and nails have subsequently been found at the much-looted site.

Ilakovac, 1968; Orlić & Jurisić, 1986a: 43 (giving the depth as 34 m); 1986b; Istenić, 1988.

Information: N. Cambi (Lipari, 1976).

See also **Nerezine** and **Viganj**.

**PALAGRUŽA A** 774 Map 1 Croatia

42° 23' N. 16° 15' E. Near Palagruža (Pelagosa); detailed location and depth not reported.

Amphoras. Mid 1st century BC?

Investigation of a badly looted site revealed the remains of a cargo of Dr. 1B and Lam. 2 amphoras; there was also at least one amphora which appears to be of form Dr. 12 (cf. **Titan**). A louterion found near the wreck may well also belong.

Orlić & Jurisić, 1987c; Radić, 1991.

**PALAGRUŽA B** 775 Map 1 Croatia

42° 23' N. 16° 15' E. Detailed location and depth not reported.

Amphoras, pottery and mortaria. Late 1st century AD (?).

A deposit some 15 m in extent is made up mostly of amphoras of several kinds: Beltrán 2A (both large and small), Haltern 70, Dr. 2-4 (one stamped **HSPA**) and Richborough 527. There are also consignments of pottery, similar to that at **Gušteranski** and **Mljet B** (perhaps Pompeian Red ware), and of mortaria of more than one size. This cargo evidently contains both W. Mediterranean and Italian goods.

Orlić & Jurisić, 1987c.

**PALAMÓS**

776

Map 4

Spain

41° 51' N. 3° 11' E. NE. of Palamós, at the Illes Formigues (or Hormigas); in an encircling basin of rocks. Depth: 42 m.

Amphoras.

c. 80-30 BC.

The wreck was partly excavated in 1958-61 by F. Foerster. About 30 amphoras were recovered, all slightly different; they were lined, and one was stamped on the neck **L.VOLTEIL** (in a foot-shaped cartouche). Though these amphoras bear some resemblance to Apulian amphoras, they were in fact made in Tarraconensis; the same stamp has been found at a kiln site in Catalonia (El Sot del Camp, near Sant Vicents de Montalt), and similar amphoras were made at Oliva in SE. Tarraconensis (Pascual, 1977: 64-6; cf. Tchernia, 1971b: 60; Aranegui, 1981: 532-3; Hesnard, 1980). The form has been defined and named 'Tarraconense 1' by Nolla (1987). There is no direct evidence for the contents of the Palamos amphoras; they could have contained either wine or fish-sauce. Shipboard items included the two parts of a sandstone hand-mill, a lead bobbin, a small lead pot, and some lead tubing (presumably from the ship's pump); there was also a small quantity of black-gloss and coarse pottery, some of which have affinities with finds in N. Africa and the Balears. A small fragment of glass is said to be blown; this is unlikely before c. 50 BC, but the piece might be intrusive. Part of the hull was excavated and raised. The timbers were assembled with treenails and occasional copper nails. The frames were cut from pieces of straight timber. There is no evidence of lead sheathing. The hull was coated internally with rosin (perhaps originally mixed with tallow and applied hot); some pieces of cloth, made from camel and goat hair, were found in this coating where they had been pressed into the chink between the planking and a floor (for similar tarry fabrics of goat and camel hair, found in the Roman harbour of Marseilles, see Boyer & Vial, 1982). It is probable that the ship was relatively small: the keel is preserved to a length of only 10.7 m, and the lead tubing indicates that the hull was only 4.4 m wide. The keel, frames and strakes are sligher than those of other Hellenistic or early Imperial ships, and the planking is only 2 cm thick (increasing to 3 cm at the outer edge of the garboard strake). The looted cargo unfortunately provides no evidence bearing on this question. The use of straight timber for the frames, possibly wood imported to a treeless area, and of camel-hair fabric, suggests that the ship was of North African origin.

Vidal & Pascual, 1971; Foerster, 1983; 1985a; 1987; Foerster & Pascual, 1983; Nolla, 1987; Nolla & Solias, 1988: 121-7.

**PALAZZOLO DI STELLA**

777

Map 8

Italy



45° 48' N. 13° 4' E. In the bed of the River Stella at Palazzolo di (or della) Stella, pr. Udine.

Tiles. Roman period.

The remains of the central part of a large Roman boat and a large number of bricks with stamps have been briefly reported.

Gandolfi, 1983: 297 (from a press report).

**PALESE** 778 Map 1 Italy

41° 9' N. 16° 46' E. Not far N. of Bari, off Palese. Depth not reported.

Amphoras. Hellenistic/Roman period (?).

An undated wreck with amphoras has been summarily reported.

De Juliis, 1984: 124.

See also **Bari**.

**PALINURO** 779 Map 9 Italy

40° 2' N. 15° 16' E. (approx.). Off Punta della Quaglia on the N. side of Capo Palinuro; 300 m from the headland. Depth: 50 m.

Amphoras. Roman period.

A Roman wreck with broken amphoras, two lead anchor-stocks, and remains of the hull, has been briefly reported.

Di Sant'Ignazio, 1976.

Information: G. Kapitän.

**PALIZI MARINA** 780 Map 6 Italy

38° 52' N. 8° 51' E. (approx.). Near Palizi Marina on Capo Spartivento (Sardinia); detailed location and depth not reported.

Sulphur. Roman period (?).

Only a summary report has been published of a wreck with a cargo of sulphur ingots, discovered in 1985 off Capo Spartivento.

Mocchegiani, 1986: 169.

**PALOMBINA VECCHIA** 781 Map 8 Italy

43° 38' N. 13° 25' E. Off Palombina Vecchia, at Falconara Maritima (near Ancona); 200 m from the beach, partly underneath a modern breakwater. Depth: 4-5 m.

Amphoras. c. 100-50 BC (?).

A wreck with spheroidal amphoras (Panella 2) and ovoidal amphoras of related types was discovered under sand and mud in 1970. The amphoras were of several varieties, with stamps **NICIA**, **E** and **ECTI**, and probably originated in Picenum. The hull, of mortice and tenon construction, was preserved to a length of at least 17 metres.

Baldacci, 1972: 21 & 25; Mercado, 1983; Profumo, 1986; Cipriano & Carre, 1989: 77-80.

See also **Ancona**.

**PALU, LA** 782 Map 5 France

43° 0' N. 6° 23' E. (approx.). In l'Anse de la Palu, on the N. side of Port-Cros island; a dense mass of sherds in a rocky hollow. Depth: 5 m.

Amphoras. 6th century AD (?).

Only brief reports have been published of a much-looted wreck with late Roman cylindrical amphoras (Keay 62). An illustrated example bears a pre-firing graffito, **XPB**. Panella dates the amphoras to the end of the 6th century, but Jézégou and Keay indicate that this may be rather too late. A tegula fragment, some stoppers cut from amphoras and tiles, and fragments of coarseware have been recovered, but no fineware. The ship's hull is represented only by a very eroded frame.

Jézégou, 1983: 14; Panella, 1983: 58; DRASM, 1985: 63-4, no. 248; Keay, 1984: 350; Pomey et al., 1989: 36-7.

**PAMPELONNE** 783 Map 5 France

43° 13' N. 6° 42' E. In the bay of Pampelonne (near St Tropez); the wreck lies on an alluvial mud bottom, on a slight slope. Depth: 63 m.

Amphoras. c. AD 300-350 (?).

A trial excavation of the wreck in 1975 showed that the original tumulus contained two superimposed layers of amphoras; about 50 amphoras were raised, all from the upper layer. The majority were of cylindrical form; they were pitched internally, and most contained the remains of a kind of langoustines. A pear-shaped amphora, unpitched, was full of resin; other amphoras were of a different pear-shaped form, of a small, globular form, and of form Almagro 51C. Two cork stoppers were found. Other finds included several lead seals, one with a cord, which were presumably originally attached to parcels. No details of the ship's structure have been observed, but the tumulus (6½ x 3½ m) suggests a relatively small ship.

Lequément, 1976.

**PANAREA (ALBERTI)**

784

Map 11

Italy

38° 37' N. 15° 5' E. 'Relitto Alberti', about 70-80 m SW. of Le Formiche di Panarea. Depth: 38-48 m.

Amphoras.

c. AD 50-100 (?).

A well-preserved but jumbled wreck of Dr. 2-4 and horn-handled amphoras was discovered in 1979; the cargo, which extended 25 x 15-18 m, was surveyed and mostly salvaged. The 77 Dr. 2-4 amphoras are of several varieties, but probably originate from the Pompeii area. The 69 horn-handled amphoras (cf. Riley, no. D 108) are in a minority of about 2/5; their place of origin is not known. There was also a single amphora of a little-known type, not otherwise reliably reported except from Pompeii (Panella, 1974/5: 152 & pl. XLI 4-5), and possibly identifiable with Dressel's form 24; it could be of South Italian or Sicilian origin (Manacorda, 1975). Two other, fragmentary amphora tops and two flat bottoms have also been recovered, and so has a piece of Gaulish terra sigillata. No other material or hull remains have been reported from this unusual wreck.

Bernabò-Brea & Cavalier, 1985: 71-4; Wilson, 1988: 125.

Information: M. Bound.

**PANAREA (ROGHI)**

785

Map 11

Italy

38° 37' N. 15° 5' E. 'Relitto Roghi' of Le Formiche di Panarea (Aeolian Islands); on the E. (Cavalier) or S. (Kapitån) side of the reef. Depth: 23 m.

Amphoras.

c. 325-300 BC (?).

A cargo of Graeco-Italic amphoras had already been looted by 1961. No closely-datable material has been found; a mortarium apparently represents ship-board equipment. The amphoras, of Will Type A1, must be of a relatively early date.

Roghi, 1971b; Bernabò-Brea & Cavalier, 1985: 69-70.

Panarea: other sites

There is said to be another wreck at 60-70 m deep off the Formiche di Panarea, and there may be two, not one, Graeco-Italic wrecks.

Information: G. Kapitån.

See also **Dattilo & Panarelli**.**PANARELLI**

786

Map 11

Italy

38° 38' N. 15° 6' E. On the Panarelli rocks, E. of Panarea; scattered among rocky gullies on the W. side. Depth: 36-39 m.

Amphoras.

c. 150-70 BC (?).

A badly broken-up, looted wreck with Dr. 1 amphoras has been briefly investigated. The amphoras appear to be of Dr. 1A type, following the formula of Hesnard & Lemoine (1981).

Wilson, 1988: 125; Bound, 1989: 31; 1991.

Information: M. Bound; M.A. Haigh.

**PANTANO LONGARINI**

787

Map 11

Italy

36° 40' N. 15° 7' E. Found in a drainage channel W. of Pachino (Sicily). Silted.

Hull only.

c. AD 600-650.

The stern portion of a large cargo ship survived destruction by earth-moving machinery, and was recorded in situ by P. Throckmorton and G. Kapitän. The planking and wales were of cypress, the frames of oak; the ship was fastened throughout by iron nails and bolts, and, though the planking was fitted together with tenons of pistachio wood, these were about 1 m apart, and were not held in place with treenails. The stern was of transom shape, and reports from workmen suggested that the ship had been 30 m long and had a Greek name carved on a nameboard. The date is uncertain; a few, unspecific sherds of combed amphoras were found in the hull, to support the 7th century date suggested by comparison with the hull of **Yassi Ada A**. Wood samples yielded C<sub>14</sub> dates of AD 500±120 (Kn-129) and AD 622±48 (P-1435). The ship's timbers were stored in water after being recorded and raised, but no further steps have been taken to conserve them.

Throckmorton & Kapitän, 1968; Lawn, 1970: 585; Throckmorton, 1973; 1987: 95.

Information: G. Kapitän.

**PANTELLERIA**

788

Map 11

Italy

36° 44' N. 12° 0' E. (approx.). On the S. coast of Pantelleria; location and depth not reported.

Amphoras (?).

Date not reported.

A reputed wreck, not yet checked, has been summarily reported.

Lamboglia, 1974: 160.

Pantelleria: see also **Baia di Gadir, Cala Gadir, Cala Levante, Punta Pozzolana.**

**Pantelleria: Campo Bello**

A wreck with Dr. 2-4, Punic and Graeco-Italic amphoras, in 30 m, has been briefly reported. This may in fact be one of the above sites.

Fugazzola Delpino, 1982.

**PANXÓN** 789 Map 15 Spain  
42° 8' N. 8° 50' W. (approx.). In the bay of Panxón, SW. of Vigo; detailed location and depth not reported.

Pottery. 1st-3rd centuries AD (?).

A possible Roman wreck is represented by a deposit of small jars with a short neck and one handle.

Hidalgo & Sotelo, 1985: 131.

**PAOLINA, LA** 790 Map 7 Italy  
42° 48' N. 10° 8' E. Some 500 m N. of Scoglio della Paolina (NW. Elba). Depth: 35 m.

Amphoras. 1st-2nd centuries AD?

Amphoras and other objects brought up by fishermen off Scoglio della Paolina are thought to be from a wreck.

Zecchini, 1971: 186; Pallarés, 1983b: 182, no. 15.

**PAROS A** 791 Map 13 Greece  
37° 6' N. 25° 15' E. In Naousa bay (Paros); near Mavronisi islet. Depth: 16 m.

Amphoras. 1st century AD.

A scattered wreck of heavily concreted amphoras was surveyed and briefly reported; the amphoras are Coan, comparable (as Bound has pointed out) with the 1st century AD type of Grace, 1961: fig. 57, rather than with her fig. 56, as suggested by the first reports.

Papathanassopoulos, 1980: 167; Papathanassopoulos & Schilardi, 1981: 140-1; Bound, 1985: 149.

**PAROS B** 792 Map 13 Greece  
37° 6' N. 25° 15' E. In Naousa bay (Paros); near Mavronisi islet. Depth: 5-7 m.

Amphoras. c. 50 BC-AD 150 (?).

A looted and poorly-preserved cargo of Roman amphoras (form not yet identified) lay widely scattered on a reef. The amphoras might be of Dr. 6 or similar form, to judge from the published photo.

Papathanasopoulos, 1980: 167; Papathanassopoulos & Schilardi, 1981: 140-1.

**PAŞALİMANI A****793**

Map 13

Turkey

40° 30' N. 27° 37' E. In the harbour of Paşalimani (Propontis); NE. of the modern jetty. Depth: 10 m.

Amphoras. 5th-4th centuries BC (?).

A 'field of amphoras', apparently from a wreck of the Classical period, has been briefly reported.

Bouzek, 1982: 140-1.

**PAŞALİMANI B****794**

Map 13

Turkey

40° 30' N. 27° 37' E. To the E. of wreck A. Depth: 15 m.

Pottery. 15th century AD ?

Pottery, including glazed ware, extended over some 20 x 15 m; it has not been closely identified.

Bouzek, 1982: 140-1.

**Patresi (Italy)**

A variety of amphoras, ranging from 7th century BC to 4th century AD, has been recovered from Patresi bay, at the W. end of Elba. There is probably at least one wreck here (cf. Zecchini, 1982: 81), but no clear report of its date or nature has been published. A scattered 1st century AD Spanish cargo was said (by Zecchini, 1971) to lie in 50 m at this site, but this has not been confirmed in later publications.

Zecchini, 1971: 186; 1982: 81, 172-3, pls 34 & 75-6; Martelli et al., 1982: 78-9.

**Pedagne, Le (Italy)**

Amphoras of forms Dr. 1 and Dr. 20 are said to have been recovered from an area off Brindisi where there are many remains. See also **Capo di Torre Cavallo**.

Sciarra, 1985: 145. An identifiable wreck site here is described by Freschi (1989: 455), but with no reference to the date or form of the amphora cargo.

**PEFKOS****795**

Map 13

Greece

36° 4' N. 28° 3' E. Found 'one mile S. of Pefkos, S. of Lindos' (Rhodes); exact location not reported. Depth: probably shallow.

Amphoras. 5th-7th centuries AD.



Only a brief report has been published of this site. In 1970, investigation revealed that a medieval wreck overlay a Roman one. There was a good deal of 'pottery of the Roman Imperial period', and some glazed pottery, presumably medieval; other finds (undated) included an iron anchor and an iron bar, glass fragments, lumps of sulphur, deadeyes and hull planking.

Boninu, 1986: 57.

**PERCHELES** **800** Map 2 Spain

36° 40' N. 2° 45' W. E. of Punta Entinas (Almeria). Depth: 10-12 m.

Amphoras. 1st century AD (?).

A variety of broken-up material from this site includes three Dr. 7-11 amphoras which probably indicate a 1st century AD wreck. Some amphoras contained fish-bones and scales.

Beltrán, 1970: 417 (cf. 397); Pascual, 1973.

**PERDUTO** **801** Map 6 France

41° 22' N. 9° 19' E. 100 m ENE. of Perduto reef, in the Strait of Bonifacio (Corsica). Depth: 21-25 m.

Amphoras. c. AD 15-25.

The cargo (now mostly robbed) comprised Dr. 2-4 amphoras of Tarraconensian type, stopped with corks. They were almost all stamped near the foot; the stamps read **CISSI** (all or part retrograde) and **HILARI**. The latter stamp, from the same die, has been found also at **Chrétienne H** and **Sud-Lavezzi C**; these three wrecks must therefore have been contemporary. The amphoras were made at El Mujal, Calella (near Barcelona). Finds included some pottery, and a bronze pan from a candelabrum. Two leaden stocks and a reinforcement collar belonging to anchors were among objects known to have been looted. The ship's hull remains in situ; it is lead-sheathed, and had some treenails repaired by driving a second, thinner treenail through the first one. The planks meet the keel at 90°, without a rabbet, as in two other wrecks with Tarraconensian cargoes, **Cap del Vol** and Los **Ullastres**.

Bebko, 1971: 2, 6, figs 264-7; Corsi-Sciallano & Liou, 1985: 145-7; Foerster, 1988.

Information: W. Bebko.

**PEREJIL** **802** Map 2 Morocco

35° 54' N. 5° 25' W. At the W. corner of Perejil island, on the S. side of the Strait of Gibraltar. Depth: 14 m.

Amphoras. Mid 2nd century BC (?).



Amphoras and domestic pottery lay scattered among weed. The amphoras are an unusual form, similar to early Dr. 1A, though they may be later than the mid 2nd century BC, and could be of local origin. What may be ballast stones were also found at the site. Other material from Perejil, perhaps not associated, includes a Dr. 7-11 amphora.

Unpublished.

Information: G.L. Palao; F.A.J. Denham.

**PERNAT A** **803** Map 8 Croatia

44° 57' N. 14° 19' E. Off Pernat point (Cres island). Depth: 31 m.

Pottery. 14th-15th centuries AD.

A relatively coherent shipwreck has produced nearly 250 pieces of household ware, including cooking-pots, bowls and cups. The pottery is probably of local origin.

Vrsalović, 1974: 238 & figs 31, 44, 173.

**PERNAT B** **804** Map 8 Croatia

44° 57' N. 14° 19' E. 'Pernat II'. Depth: 32-35 m.

Amphoras. 2nd century BC (?).

Over 80 amphoras have been raised from this wreck. They are an early type of Lam. 2 (one with a triangular section rim); none is stamped. No hull remains have been found.

Vrsalović, 1974: 134 & 238 (amphoras described as 'Graeco-Italic'); Cambi, 1989: 318-20.

Information: M. Orlić (Lipari, 1976).

**PESARO** **805** Map 8 Italy

44° 10' N. 13° 25' E. (approx.). In deep water between Pesaro and Fano; detailed location unknown.

Amphoras. c. 125-25 BC (?).

Among fishermen's finds from the Adriatic off Pesaro are some Lam. 2 amphoras which must represent at least one wreck.

Dolci et al., 1986: 4-11.

**PETIT CONGLOUÉ, LE** **806** Map 5 France

43° 10' N. 5° 23' E. Off Le Petit Congloué islet; set in a muddy bottom.  
Depth: 60 m.

Amphoras and dolia. c. AD 40-60 (?).

The mouths of fifteen great dolia, surrounded by amphoras, were first seen, looming through the murk 60 m below the surface, in 1979; successive campaigns of investigation by the DRASM were broken off when a volunteer diver died in 1983 in an incident at this very deep site. The dolia were arranged in quincunx in three files, occupying the central part of the ship. They were very large, 1.85 m in diameter; each held over 2,000 litres, almost the equivalent of 100 amphoras. No doubt they had been permanently installed in the ship. They had been extensively repaired with lead (whether when new or after a period of use). One was stamped **C.PIRANVS FELIX FEC** and **C.PIRANVS PHILOMVSVS F**, linking this ship with other 'tankers' of the mid 1st century AD (eg. La **Garoupe**) and with the Piranus household of Minturnae. Fore and aft of the dolia were loaded a considerable number of amphoras. Most were of form Dr. 2-4, of Tarraconensian type; stamps found were **AMAND(I)**, **PATERN(I)**, **PLOC** (retrograde), **GE** and **SC**. There were also some flat-bottomed amphoras of Gaulish origin (Laubenheimer G3); these were found, tumbled, at the sides of the main deposit, indicating that they had been stowed above the dolia and the Dr. 2-4 amphoras, doubtless at a point en route. A single Dr. 2-4 amphora of probable Campanian origin was also raised; it is not known if this was part of a cargo consignment. An iron anchor lay towards one end of the wreck; this was in fact probably the stern, since a brick (overfired, and covered with a black coating), which could have been part of a galley, and a pipe, presumably part of the pump, were found there too. No other shipboard items, or hull remains (which must certainly exist), have been found. The overall length of the ship is estimated at 22-23 m.

Corsi-Sciallano & Liou, 1985: 26-43 (subsuming other, briefer accounts); Liou, 1987b: 275; Hesnard et al., 1988: 128-31.

**PETIT RHÔNE, LE** 807 Map 4 France

43° 24' N. 4° 18' E. (approx.). Found by a fisherman, W. of the mouth of the Petit Rhône. Depth: 18 m.

Lead ingots. Roman period (?).

At least six lead ingots were brought up in a trawl net; one has been studied. It is of spherical segment shape, 35-38 cm in diameter and 13 cm high; the rounded top has been incised with the Roman numeral **CCXX**, which corresponds to its weight, 70 kg, in pounds (200 lbs=71.4 kg). Some of the ingots found at **Ploumanac'h** are of the same shape. No associated material has been reported; the date and origin (SW. Gaul ?) of the Petit Rhône ingots remain uncertain.

Maréchal, 1987a.

**PETROKARAVO** 808 Map 13 Greece

37° 36' N. 23° 29' E. At Petrokaravo (or Petro) reef, in the Saronic Gulf.  
Depth: not reported.

Tiles. Classical period.

A summary report refers to a Classical cargo of Laconian type roof-tiles near Petrokaravo.

Hood, 1961-2: 5.

**PHILADELPHIA**

**809**

Map 14

Israel

32° 58' N. 35° 4' E. 5 km N. of Acre (Akko), 300 m from shore; the wreck lies on an offshore reef, near Philadelphia holiday village (not far from Shave Ziyon). Depth: 9-12 m.

Amphoras.

5th century BC.

The cargo of jars, probably from the area of Tyre, was scattered over an area up to 200 m across, but concentrated in a nucleus, 10 x 3 m, which was excavated by A. Raban. Including amphoras lifted by a fisherman, about 100 were present, all lined with a tar produced from grape-pulp. Remains of grapes (resembling modern raisin-grapes) were preserved in some. Sherds of other Iron Age jars were possibly remains of ship's stores, as were four amphoras of Cypriot, Greek and possibly Punic origin. The Greek amphoras in particular indicate a date in the 5th, rather than the 6th, century BC.

Raban, 1973: 34; 1976. Some material appears to be catalogued by Zemer (1977), though he does not refer to the wreck.

Information: E. Linder (Lipari, 1976).

**PIADHA**

**810**

Map 13

Greece

37° 40' N. 23° 10' E. At the S. entrance of Piadha bay, N. of Epídhavros; 30 m from the point. Depth: 30-35 m.

Tiles.

5th-1st centuries BC ?

A cargo of Laconian type tiles, mostly covered by alluvium from nearby torrents, has been briefly reported. No date has been assigned to the wreck.

Papathanassopoulos, 1980: 165.

**PIAN DI SPILLE**

**811**

Map 7

Italy

42° 12' N. 11° 40' E. (?). Near Tarquinia (Tuscany); detailed location and depth not reported.

Amphoras.

Mid 4th-5th century AD.

A cargo of African amphoras (Keay 25; cf. Manacorda, 1977a: 171-90) has been summarily reported. Also found was one amphora of Keay form 52, originating in Calabria.

Arthur, 1989a: 134 & 141 (citing M. Incitti).

**PIANOSA A**                                      **812**                                      Map 7                                      Italy

42° 34' N. 10° 6' E. On the E. side of La Scola reef, E. of Pianosa island.  
Depth: 35 m.

Amphoras.                                      c. AD 50-100.

A wreck, said by Totaro et al. to have been discovered in 1989, may well be the same site mentioned by Zecchini. The 1989 site, in 33-36 m, is a scatter of amphoras, mostly Dr. 2-4 and various other amphoras, surrounded by sea-grass. The amphoras include Dr. 20, Beltrán 2B, and 'Pelichet 47' (Laubenheimer G4); other amphoras of both earlier (Dr. 1A) and later (Afr. 2A) date are also present, however.

Zecchini, 1971: 190; Totaro et al., 1991.

**PIANOSA B**                                      **813**                                      Map 7                                      Italy

42° 34' N. 10° 6' E. (approx.). Off the E. side of Pianosa, near the Roman villa. Depth: approx. 40 m.

Pottery.                                      1st century AD.

No details have been reported of what is described as a Roman pottery wreck.

Zecchini, 1971: 192.

**PIEDRA NEGRA**                                      **814**                                      Map 4                                      Spain

42° 19' N. 3° 19' E. Off the point of Cap de Creus (Girona); between the point and La Masa d'Or rocks. Depth: 70 m.

Amphoras.                                      c. AD 75-150 (?).

An amphora wreck lies in a deep underwater canyon, on a sandy bottom; by the time it was declared and briefly surveyed in 1965 it had been much looted. The amphoras include Dr. 20, in both full-size and half-size versions, and their form suggests a date between the late 1st century and the mid 2nd century. One amphora is stamped, but the stamp as published is illegible.

Pascual, 1964; Beltrán, 1970: 482; Nieto, 1986: 82.

See also **Cala Culip** and **Masa d'Or**.

**PIERRES PLATES**                                      **815**                                      Map 5                                      France

43° 2' N. 6° 28' E. (approx.). Near Île du Levant; detailed location and depth not reported.

Amphoras.                                      c. AD 300-325 (?).

A cylindrical amphora from a wreck of this name has been published by Carrazé without further information. The site may be a doublet of another.

Carrazé, 1976a: 65-6.

Pietra Mesola, La: see **Porto Badisco**.

**PIGNATARO DI FUORI**

**816**

Map 11

Italy

38° 28' N. 14° 53' E. In Pignataro di Fuori bay, Lipari; scattered on a sandy slope. Depth: 35-40 m.

Pottery.

c. 1600-1550 BC.

A spread of Bronze Age pottery, extending over an area 50 x 40 m, was discovered and surveyed by E. Ciabatti. No hull remains were found, though it is possible that more material still lies hidden under sand. The site was contaminated by later material, but there seems little doubt that it was in fact a wreck. The pottery, of the Capo Graziano culture, phase I, comprises jars, bowls and one-handled cups, about 20 pieces in all. The ship was possibly being loaded on the beach, tried to get off against a sudden on-shore storm, but failed to weather the headland of Monte Rosa, which in those days will have been more prominent.

Ciabatti, 1984; 1985b.

**PIRAEUS A**

**817**

Map 13

Greece

37° 56' N. 23° 38' E. (approx.). Found by dredging in Piraeus harbour in 1930. Depth unknown.

Works of art.

2nd century AD.

Sculptures of the 2nd century AD were dredged from 'a flat-bottomed vessel which had burned and sunk' in the harbour.

Bass, 1966: 78.

**PIRAEUS B**

**818**

Map 13

Greece

37° 56' N. 23° 38' E. (approx.). 200 m from the headland of Akte, off the Naval School. Depth: 27-30 m.

Amphoras.

Date unknown.

An oceanographic ship discovered what appears to be an ancient wreck in the harbour of Piraeus; no corroborative detail has been reported.

Touchais, 1987: 525 (from press reports).

Information: G. Kapitān.

### Pischanovo (Ukraine)

A hoard of 15 Greek bronze vessels, dating from the 5th and the early 4th centuries BC, was discovered in a 5 m long dugout. The site, in a tributary of the R. Supoy, is outside the scope of this catalogue.

Ganina, 1964; 1970; Hind, 1973/4: 82.

**PLANE A** **819** Map 5 France

43° 11' N. 5° 23' E. 'Plane 1', between the islands of Plane (=Calseragne) and Riou (Marseilles bay). Depth: 20 m.

Amphoras and pottery. c. 50 BC.

A well-preserved wreck, overgrown with sea-grass, was briefly investigated by the DRASM. A sondage was made in the centre of the wreck, which found the mast-step; it contained an Iberian coin of Cese (Tarraco), c. 150-100 BC. The main cargo was of Dr. 1B amphoras, nearly all stamped; recorded stamps are **ARTE**, **[DI]OPHAN**, **HERAC**, **HERACLIDA**, **METROP**, **NVN**, **PHILOX** and **SELEV**. The amphoras, which probably originated in the S. Latium/N. Campania area, were stopped with corks and seals; all the seals were stamped with the same name, probably **AP.ATTI**. There were also one or more amphoras of form Lam. 2. The cargo included, besides amphoras, a consignment of lamps (glazed black, brown or red), and plentiful pottery, which must also have been cargo, both coarseware (especially plates with internal red glaze) and fineware (consisting of black-gloss pottery from Arezzo). This last was of the very latest type prior to the change to red-gloss; some pieces bear the stamp **Q.AF**, which is found elsewhere on red-gloss ware. A further class of pottery was 'pre-sigillata' (orange-brown gloss ware), of uncertain origin.

This site has both similarities and points of difference with the contemporary wrecks **Dramont A** and **Madrague de Giens**.

Lequément & Liou, 1976; Charlin *et al.*, 1978: 76-7; DRASM, 1983: nos 305-24; 1985: 59-60; Amar & Liou, 1984: 156.

**PLANE B** **820** Map 5 France

43° 11' N. 5° 23' E. Near wreck A. Depth: 35 m.

Amphoras, pottery, and copper ingots.  
Late 5th-early 4th century BC.

A brief inspection by the DRASM was made of an important wreck, declared in 1975 but thereafter looted. The cargo included Massiliot, Punic and Greek amphoras; the last were either from Chios, or perhaps rather from Magna Graecia. There was also plain black Attic pottery and lamps, and some fragments of coarseware. The main cargo, however, apparently comprised copper ingots, pebble-shaped, with much variation of size and weight; about 60 were salvaged. Their origin is unknown. Three published examples were of 15, 25 and 40 cm

diameter. Some net weights were also found. The general makeup of the cargo can be compared with that of **Porticello**. The hull, much damaged, was of thick planks, assembled with mortices and tenons.

DRASM, 1983: nos 153 & 165-71; 1985: 43-4; Pomey et al., 1989: 18-19.

**PLANE C** **821** Map 5 France

43° 11' N. 5° 23' E. At Le Rocher de l'Estéou, SE. of Île Plane. Depth: 10-26 m.

Amphoras and other cargo. 10th century AD.

A widely-scattered Arab (Saracen) wreck, similar to those at **Agay** and Le **Bataiguier**, contained some jars (stopped with corks) and several clay balls filled with bitumen or asphalt. Other finds included several lamps, a glazed plate, a flagon, two strainer-flasks and two jugs. There were numerous iron concretions, which included an adze-hammer, a double-axe, an axe, a hook, a large gouge, a burin, a nail-lifter or drove, a caulking-tool, a pick, rings, and many nails. There were two circular mill-stones. Part of the ship's hull was preserved; the planking was laid on plank by plank, nailed with iron nails, and caulked with bitumen. The pottery on board indicates that the ship came from Spain.

Ximénès, 1976a; Lequément, 1985: 111; DRASM, 1985: 113-4.

**PLANE D** **822** Map 5 France

43° 11' N. 5° 23' E. At the same site as wreck C; known as 'the Roman wreck SE. of Plane'.

Amphoras. c. 100-25 BC.

The Arab wreck (**Plane C**) partly overlay a wreck with a cargo of Dr. 1B or 1C amphoras. These amphoras were stamped with a series of two-letter stamps: recorded examples are **CE**, **DD**, **DF**, **DP**, **DR**, **EG** and **EH**. Similar amphoras were found at **Estérel**; they were probably made at Parrina, near Cosa in Etruria.

Ximénès, 1976b; Manacorda, 1981: 25-8.

**PLANE E** **823** Map 5 France

43° 11' N. 5° 23' E. Exact location and depth not reported.

Amphoras. 2nd half of 1st century BC (?).

A wreck first recognized in 1987 is being excavated by A. Hesnard. The cargo is said to be of Italian amphoras, probably oil amphoras, including some of Apulian (spheroidal) form.

Hesnard et al., 1988: 155-6.

See also **Ouest de Plane**.

**PLANIER A**

**824**

Map 5

France

43° 11' N. 5° 13' E. 'Planier I', off Planier island (Marseilles bay); 40 m from the jetty at the NW. corner of the island. Depth: 32 m.

Amphoras.

c. AD 1-15.

An oval, compact mound of Dr. 2-4 amphoras, extending 12 x 7 m, was discovered in 1955. A modern cargo-ship was wrecked at the spot in 1970, and, in 1981, part of her hull broke off, and, careering down the slope, disturbed the Roman site, which was accordingly investigated by the DRASM. The amphoras (of which several hundred were looted between 1955 and 1981) were of Tarraconensian type, in two fabrics; the two varieties were probably loaded one below the other. Stamps have been found only on one variety; recorded stamps are **A**, **M** and **M.S.PVP**. The amphoras were pitched inside, and had terracotta stoppers. Shipboard items included a Campanian Dr. 2-4 amphora, a pottery 'gourd', a mortarium, and some stamped Arretine ware which dates the wreck to the first decade AD. Organic items were preserved: besides two wooden plates, two wooden figurines have been recovered. About 35 cm tall, of pine wood (*P. pinea*), they represent a man wearing a toga and a boy with a *bulla* (amulet) and a large (separately fashioned) phallus. Such objects are unparalleled (save at La **Luque A**, q.v.); their interpretation is quite uncertain, but some association with Priapus seems likely, and perhaps they were part of a shrine on board. A lead anchor-stock, reported by Benoit, may not be associated with this wreck.

L'Hour, 1984; cf. Benoit, 1956: 26-7, no. 1; Carrazé, 1976a: 69, fig. 3, no. 66.x.33; Corsi-Sciallano & Liou, 1985: 17-25.

**PLANIER B**

**825**

Map 5

France

43° 11' N. 5° 13' E. 'Planier II', 250 m W. of the N. point of the island, at the foot of Le Souquet reef; there may be some confusion about the location in the early reports. Depth: 30 m.

Amphoras and copper ingots.

Mid 2nd century AD.

It appears that there is a homogeneous wreck of Dr. 20 amphoras W. of Planier island. Benoit (1956) attributed not only Dr. 20 amphoras but also a Dr. 1 amphora to the site, but this may be rejected as an intrusion or a mistaken report. The Dr. 20 wreck was later confirmed by Benoit; he says the amphoras were unstamped, but Amar & Liou have found two necks stamped **QIMFN**, and Carrazé refers to one stamped **QIMPF**, perhaps in fact the same. The profile of one amphora published by Benoit suggests a date more or less in the mid 2nd century AD. Later investigations, reported by Euzennat, have shown that the copper ingots which Benoit thought belonged to a wreck called 'Planier D (IV)' in fact came from this site, and that the material from Planier D is a jumble of various dates. It seems perfectly possible that the Beltrán 2B amphoras which Benoit published as from 'Planier D' did in fact come from wreck B; a similar association of Dr. 20 and Beltrán 2B amphoras occurs at Les **Negres**, for example. The reported positions of wrecks B and D are only 40 m apart.

It appears that at least 50 copper ingots were part of this cargo; almost all have been looted and destroyed. Two have been published, and one of these



reads **IMP ANTONIN | PRIMVLI SILONIS | CCXCVII | PRO SONO | BANSIS**. Lines 4 & 5, as read by Euzennat, contain a reference to a PR(OCVRATOR) O[S]SONOBANSIS; this would be an Imperial official, stationed at Ossonoba (Estoi, near Faro, in Algarve). This reading is not completely convincing; given the wide field available for the inscription, the break between lines 4 & 5 is odd, and the reference to Ossonoba can hardly be regarded as definite. The earlier reading (Onobensis) might still be correct, in fact. The second ingot from the site bears no imperial name or titles, though it, too, apparently has a numeral which corresponds with its weight in pounds. One can only lament the loss of the other ingots from this wreck, which could have shed a great deal of light on the history of the southern Spanish mines in the 2nd century AD.

A bearing, presumably from a pump, is mentioned by Carre & Jézégou (1984: 134) as found at 'Planier 4', 2nd century AD; perhaps they mean the present wreck.

Benoit, 1956: 27; 1962: 153; Carrazé, 1971a; Euzennat, 1971; Amar & Liou, 1984: no. 194; Long, 1987a: 10, note 7.

#### PLANIER C

826

Map 5

France

43° 11' N. 5° 13' E. 'Planier III', 250 m SW. of the island; the wreck lies mostly in a large hollow, at the foot of a reef. Depth: 28-35 m.

Amphoras, pottery and minerals. c. 60-40 BC.

A relatively well-preserved wreck was excavated by A. Tchernia and P. Pomey in 1968-75. It had a cargo of amphoras comprising mostly Dr. 1B (with potters' signatures on the rim), and, in addition, Panella 2 and Lam. 2 amphoras. Both the last two kinds bore stamps, which, on the Panella 2 amphoras, were of **M. TVCCI. L. F. TRO. GALEONIS**; this may be a Tuccius known to Cicero who died in or before 47 BC. The cargo also included realgar, litharge and blue frit, which had possibly been taken on board at Pompeii. Some of the Dr. 1 amphoras had been closed with epigraphic seals, taken from the site before the official excavations.

Shipboard equipment included lamps, coarseware cups and jars, and part of a set of serpentine weights (marked **X**, **V**, **II** and **S**, their weight in pounds). There was a considerable quantity of black-gloss ware, in a central Italian fabric similar to Camp. B ware, datable to the middle of the first century BC, and also one or two plates of early Arretine red-gloss ware. This early date for the beginning of Arretine production confirms the observations of Lamboglia (1950) at Ventimiglia (where Arretine was found in a layer dated c. 50 BC) and the arguments of Wiseman (1963) for a start c. 50-40 BC on prosopographic grounds. The fineware on board Planier C included five cups and five plates, which may indicate the number of crew, or, at least, those of them who messed at the end of the ship where the pottery was found (apparently the stern). Other indications of life on board come from the remains of some bronze cups and a candelabrum, as well as the remains of a sinciput (split head of pig), no doubt originally preserved rather than fresh, and a luxury item down to the 1st century BC, though more modest under the Empire.

A photogrammetric survey of the hull enabled its dimensions to be estimated at 20 x 5 m. Part of one side of the ship survived, with 14 strakes; it included a wale, which may have been at the waterline. The hull was lead-sheathed up to this wale, and, above it, the planking was thinner. The planking and wale were assembled before the frames were inserted. Another section of planking, found at what appears to be the stern part of the ship, includes part of what is either a gunwale or a steering-oar housing. Some tiles were found.

Benoit, 1962: 153-4; Tchernia, 1969: 487-92; 1971a; Liou, 1973: 586-9; McCann et al., 1977: 294-6; Liou & Pomey, 1985: 553-6; Tchernia et al., 1986; Cipriano & Carre, 1989: 74-7.

**PLANIER D** **827** Map 5 France

43° 11' N. 5° 13' E. Close to wreck B; lower down the cliff at the foot of Le Souquet reef. Depth: 40 m.

Amphoras. c. 100-25 BC.

The early accounts of 'Planier IV' have been shown to be useless by Euzennat; in fact, there is material of every period at the site. However, an assemblage of Dr. 1B amphoras and Camp. B pottery, identified by I. Sortais, very likely represents a shipwreck.

Euzennat, 1971: 92-3; Carrazé, 1970c; 1975: 50; Long, 1987a: 10, note 7.

**PLANIER E** **828** Map 5 France

43° 11' N. 5° 13' E. 'Planier 5', W. of Planier island, on a sandy bottom. Depth: 35-40 m.

Amphoras. c. 100-50 BC (?).

Little information has been published about this site. Benoit describes the cargo as comprising Italian amphoras of different kinds; those illustrated are ovoidal. Two complete amphoras contained shells (identified as of Pitaria chione, Lutraria and Glycymeris pilosa). Two lead anchor-stocks came from the middle of the site, and part of an iron anchor was found, too. Near the site, various finds included a sounding-lead. The amphoras may be, not Italian, but Spanish, whether from Baetica or Tarraconensis; this, however, is just one aspect of this important wreck which remains uncertain, pending further information and fuller study.

Benoit, 1962: 156; cf. Carrazé, 1970f.

**PLANIER F** **829** Map 5 France

43° 11' N. 5° 13' E. 'Planier 6'; immediately adjacent to wreck C, from which it is separated by 'a thin band of sand'. Depth: 35 m.

Amphoras. 1st century BC.

An early report of a wreck of 'Italic' amphoras at this site has recently been confirmed, but only briefly.

Benoit, 1962: 156; Long, 1987a: 10, note 7.

**PLANIER G** **830** Map 5 France

43° 11' N. 5° 13' E. 'Planier 7'; near the NW. point of Planier island, on a sandy bottom. Depth: 48 m, with some material at 65 m.

Amphoras. c. AD 300-350 (?).

The main tumulus of amphoras (subsequently looted) occupied an area only 7 x 8 m; an unspecified portion of the cargo had slid further away down-slope, but the whole cargo was probably of modest size. Various types of Afr. 2C amphoras, together with some of form Almagro 50, were found in the wreck, and an Almagro 51C amphora said to have been found nearby probably belongs to this wreck as well; a cylindrical amphora (Keay 61) said by Liou (1975) to have been found at this site must be a century too late to belong, however. Some of the Almagro 50 amphoras contained shells identified as Pectunculus pilosus, more usually known as Glycymeris pilosa Linné 1767, while two of the Afr. 2 amphoras were full of pitch.

Benoit, 1962: 157-61; Zevi & Tchernia, 1969: 197-9; Liou, 1975: 582-3.

**PLAVAC A** 831 Map 8 Croatia

43° 41' N. 15° 51' E. At Cape Plavac (Zlarin); detailed location not reported. Depth: 30-33 m.

Amphoras and pottery. Late 1st century BC-early 1st century AD.

A rather well-preserved wreck with interesting material of the Augustan period has not been published in extenso. The cargo amphoras were of Dr. 2-4 form, with some variations; one stamp has been reported (**CAVSIVS SVRVS**). There was also a consignment of moulded terra sigillata, possibly from Puteoli, mostly cups and jugs with floral and figured decoration. One stamp has been reported (**TETTI**, in a foot-shaped cartouche). Shipboard equipment included lamps, fine-ware plates, coarseware and a storage jar; several items were inscribed **NI**. Quantities of tar were found, as well as a wooden pulley, a sounding-lead, and two iron anchors. The hull was at least partly constructed of chestnut or oak (for frames) and spruce; copper nails are reported, and also lead sheathing. Lead tubing and a collecting-tank were found; the total length of the assemblage was 8.32 m, indicating the beam of the ship, which must therefore have been large (25-30 m long). Two C<sub>14</sub> dates for the hull, suggesting a date in the 3rd century BC, seem irrational.

Vrsalović, 1974: 238-40, with figs 45 & 51; Brusić, 1975; Gunjaca, 1976/7; Booth, 1984 (Z-567 & Z-568).

Information: Z. Brusić.

**PLAVAC B** 832 Map 8 Croatia

43° 41' N. 15° 51' E. Detailed location and depth not reported.

Pottery. 1st century AD.

A pottery wreck (distinct from wreck A) is listed without comment by Vrsalović; the status and date of the wreck remain to be confirmed.

Vrsalović, 1974: 240, no. 24.

**PLEMMIRIO A**

**833**

Map 11

Italy

37° 0' N. 15° 21' E. (approx.). Believed to be in the area of Plemmirio, i.e. Capo Murro di Porco, S. of Syracuse (Sicily); the exact location is not known.

Metal objects.

4th-5th centuries AD.

Two groups of bronzes brought in by divers represent all or part of a late Roman metal consignment, comprising lamps, censers, pitchers, bowls, a steel-yard, etc.

Kapitän & Fallico, 1967.

**PLEMMIRIO B**

**834**

Map 11

Italy

36° 59' N. 15° 20' E. On a rocky slope at the foot of cliffs near the SE. point of the Plemmirio peninsula. Depth: 22-47 m.

Amphoras and iron bars.

c. AD 200.

The wreck, partly excavated by D.J.L. Gibbins, was scattered over a wide area down the underwater slope, but there were some dense concentrations of material. The cargo included amphoras of forms Afr. 1 and Afr. 2A; the remains of some 40-50 have been raised, and they cannot originally have numbered more than 200 or so. Afr. 2A outnumbered Afr. 1 amphoras 3 to 1. One Afr. 1 amphora contained olive-pits, encrusted to its inner wall. The Afr. 2A amphoras were pitched inside; one was stamped [ ]PP, and another bore a dipinto, perhaps reading **ECTTERE**. The Afr. 1 amphoras had pottery stoppers; the Afr. 2A amphoras, to judge from a stopper found lying loose, were stopped with a crude bung of clay. The cargo also included about a ton of iron bars, of two sizes, (1.0 m and 0.5 m long), straight, of rectangular cross-section.

The accommodation area of the ship was represented by 25 roof-tiles (both tegulae and imbrices), three or four bricks, two square stone blocks, and a pottery 'vaulting tube'; all or some of these items could have belonged to a cooking structure (a galley) of some kind. In this area were found various amphoras (including one of Tripolitanian form and a pear-shaped amphora from Mauretania or Tunisia), coarseware cups, jugs and plates, and soot-blackened cooking-ware. There were also two glass vessels, four lamps (two African, and two probably Italian), a lead fishing-weight and two bronze arrowheads. Other finds, more unexpected, were equipment apparently belonging to a doctor, comprising two bronze scalpel handles, the bronze handle of an iron cautery, and a stick which may have been for tightening tourniquets. Some of the iron concretions found on the site may be, not cargo, but tools, fittings or anchors of the ship; small pieces of lead sheathing and some iron nail concretions represent the hull, and a sounding-lead its equipment. Some wood fragments and fibrous material (straw packing ?) have also been found.

Parker, 1981a; Gibbins & Parker, 1986; Gibbins, 1988; 1989; 1991; unpublished.

**PLEMMIRIO C**

**835**

Map 11

Italy

36° 59' N. 15° 20' E. At the tip of Capo Murro di Porco, 220 m E. of wreck B; partly on an underwater shelf. Depth: 35-50 m.

Amphoras. Mid 6th century BC.

A Greek amphora (now in the Musée Borély, Marseilles) was found less than 200 m W. of Capo Murro di Porco by J-Y. Cousteau and F. Dumas in 1953, together with two other amphoras, some concretions and a pile of stones (perhaps ballast). This may be the same site at which G. Kapitán found fragments of archaic Corinthian A and B amphoras in 1976, and at which a local diver claims to have found Black-Figure pottery. Exploration of the area by D. Gibbins (1987) located the much-looted remains of a wreck with amphoras resembling the 'Graeco-Massiliot' amphoras of Le Dattier, and further investigation has subsequently confirmed that Corinthian amphoras of both types are present.

Gibbins, 1987; Wilson, 1988: 116.

Information: B. Basile; G. Kapitán; D.J.L. Gibbins.

**PLITHARIA** 836 Map 1 Greece

38° 15' N. 20° 39' E. At Plitharia, in Sami bay, on Kefallinia (Cephalonia). Depth: 7 m.

Amphoras. Late Roman/early Byzantine.

Several piles of amphora sherds, lying close to shore, appear to be a wreck group, but the material may have been caught in a fishing-net elsewhere and dumped at this point. No details of the amphoras have been published.

Stavrolakes & Edgerton, 1974.

**PLOČICE** 837 Map 8 Croatia

44° 32' N. 14° 30' E. (approx.). At Pločice, said to be near Mali Lošinj (Lošinj island); detailed location and depth not reported.

Roof-tiles. Roman period.

No details have been reported of a wreck with a cargo of tiles, but an underwater photo shows what must be Roman tegulae.

Vrsalović, 1974: 240 & fig. 29.

**PLOUMANAC'H** 838 Map 15 France

48° 54' N. 3° 27' W. At Les Sept Îles, 5 miles off the N. coast of Brittany; between Malban and Bonnot islands. Depth: 10 m (at high water).

Lead ingots. 3rd-4th centuries AD ?

A cargo of over 200 lead ingots, weighing 20 tons, was discovered off Brittany in 1983 and has been excavated by L. Le Tiec and M. L'Hour, though some parts of the site, which could conceal small finds, remain to be dug. The ingots, of which 197 have been recovered, are of irregular fabric, evidently cast in hollows in the ground: 80% are quadrangular, 18% flat or circular and 2% bell-shaped or lunate. Some have a moulded cartouche, in which can sometimes be read the letters **MIVS**. They also bear incised inscriptions, which consist of Roman personal names, abbreviations and numerals, rather coarsely cut, and sometimes numerals in a finer style. They range in weight from 27 to 150 kg, and are difficult to fit to a single unit of weight, though the heavier ones seem to be weighed in pounds of 300-320 g. Analysis of the lead suggests the ingots came from Britain. Since they do not resemble typical Romano-British ingots of 1st-2nd century date, they might be pre-Roman; however, the presence of definitely Roman names such as **CLEMENTINI** and **CIVILIS** indicates they are more likely of mid or late Empire date. L'Hour suggests they may have been made in connexion with Count Theodosius' campaigns of AD 367; however, the letters **AL** (sometimes in ligature) which are found on many of the ingots look like a technical term rather than an abbreviation of ala (his suggestion), whereas the personal names suggest attribution to a centuria or turma as in other kinds of military inscription. The tall **B**, often in ligature with **R** or another letter, which in several cases follows **C**, could possibly stand for C(lassis) Br(itannica). The supposed tribal names Brig(antes) and Icen(i) which might be read on some ingots, if they are correctly transliterated, are also likely to be a personal name, to judge by the other examples in the cargo. Other material from the site does not fix the date: there were a substantial number of roof-tiles of Roman type, and both parts of a hand-mill of sandstone (not attributable to a specific geological source). No remains of the ship have been found.

Pollino, 1984: 13-21; DRASM, 1985: 75-6; Kainic, 1986; L'Hour, 1985; 1987a; 1987b.

Information: M. Dean.

**POINTE BACON** 839 Map 5 France

43° 34' N. 7° 8' E. SE. of Antibes; at the foot of La Boutte reef. Depth: 7-15 m.

Amphoras. 4th century BC.

An amphora cargo lay partly scattered on rock, partly buried in sand. The amphoras were mostly Massiliot, type 2 of Benoit (1965a), with one Corinthian. There was also pottery, including fragments of bucchero. The material has been fully published, but no detailed site survey appears to have taken place, and intrusive material has been found.

Tchernia, 1969: 467-8; Mercier, 1972; Liou, 1973: 603-4; Clergues, 1973: 116-7; Joncheray, 1976f: 55-6; Pollino, 1983: 33.

See also Le **Dattier**.

**POINTE DE LA GALÈRE** 840 Map 5 France

43° 1' N. 6° 24' E. On the N. side of Port-Cros; scattered over rocks. Depth: 8-15 m.

Tiles (?). c. AD 1-50 (?).

A dozen rounded tiles may represent a scattered cargo; coarse pottery and an amphora (cf. Haltern 70) indicate a wreck of the earlier 1st century AD.

Pomey et al., 1989: 36.

**POINTE DEBIE A** 841 Map 5 France

43° 16' N. 5° 18' E. 'Pointe Debie 1', on the E. slope of Pomègues island. Depth: 28 m.

Amphoras. 1st century AD.

A wreck, much damaged by trawling, was declared in 1981; it had a cargo of Dr. 7-11, Beltrán 2B, Tarraconensian Dr. 2-4 and Gaulish amphoras, with a single handle of a Dr. 20.

Pomey et al., 1989: 14-5.

**POINTE DEBIE B** 842 Map 5 France

43° 16' N. 5° 18' E. Off Frioul island, Marseilles bay; 200 m from a similar wreck at La Luque A. Depth: 16 m.

Tiles. c. AD 225-250.

A well-preserved but now looted cargo of roof-tiles was named 'Frioul' by Frost and Dumas. More recent re-examination of the wreck (by then named 'Pointe Debie') produced a sestertius of Severus Alexander (AD 222-235).

Frost, 1963: 218-9; Dumas, 1972: 148; Liou, 1975: 581.

**POINTE DU BLÉ** 843 Map 5 France

43° N. 6° E. Said to be situated between Toulon and Île du Levant; detailed location and depth not reported.

Amphoras. c. 100-25 BC.

A wreck of Dr. 1B amphoras has been briefly reported.

Carrazé, 1976b: 154 & pl. III.

**POINTE DU BROUIL** 844 Map 5 France

43° 10' N. 6° 35' E. Off Pointe du Brouil (or Dubreuil), Cavalaire bay. Depth: 32 m.

Amphoras and fineware. c. 140-130 BC.

A cargo of Transitional amphoras and black-gloss pottery (similar to Camp. B), probably from N. Campania, was excavated by the DRASM in 1981-2. A consignment of hazelnuts was also on board. Lying on the hull were coarseware, fine-wall ware, a Camp. A plate, lead weights, two Roman asses, and part of a balance. The hull showed traces of a severe fire, which was doubtless the cause of sinking.

DRASM, 1983: nos 237-243; 1985: 98-100, no. 426; Pomey et al., 1989: 28.

**POINTE GRENIER** 845 Map 5 France

43° 9' N. 5° 40' E. Near St Cyr-sur-Mer; detailed location and depth not reported.

Amphoras. c. 150-25 BC.

A wreck of 'Italic' amphoras has been listed without details.

Benoit, 1962: 169, no. 20.

**POINTE LEQUIN A** 846 Map 5 France

43° 1' N. 6° 13' E. On the N. side of Porquerolles island, in two depressions. Depth: 6-15 m.

Amphoras & pottery. Late 6th-early 5th century BC.

Three superimposed wrecks at Pointe Lequin are under excavation by L. Long. The earliest had a cargo of Massiliot amphoras, and Attic and 'pseudo-Attic' (perhaps Italian) pottery.

Morel, J.-P. in Rouillard & Villanueva-Puig, 1989: 138 & 144; Pomey et al., 1989: 32-4. A recent (unpublished) report by G. Volpe distinguishes two wrecks, one late 6th century, with Corinthian A and other amphoras and Attic pottery, the other a few decades later, with Massiliot amphoras.

**POINTE LEQUIN B** 847 Map 5 France

43° 1' N. 6° 13' E.

Amphoras & pottery. c. 200-150 BC.

The second wreck at Pointe Lequin has a cargo of Graeco-Italic amphoras, with a few Punic amphoras and a consignment of Camp. A plates, cups and lamps.

DRASM, 1985: 50, nos 126-8; Pomey et al., 1989: 32-5.



**POINTE LEQUIN C**                                 **848**                                 Map 5                                 France

43° 1' N. 6° 13' E. 20 m SE. of wrecks A & B.

Amphoras.   c. AD 50-70 (?).

The third wreck at Pointe Lequin has a cargo of Tarraconensian Dr. 2-4 amphoras. Other finds include Gaulish and Dr. 7-11 amphoras and Arretine pottery, datable to the Neronian period.

Miró, 1988: 365; Pomey et al., 1989: 35.

**POINTE MOUSSURE**                                 **849**                                 Map 5                                 France

43° 11' N. 6° 40' E. Near Pointe Moussure, W. of Cap Camarat. Depth: 24 m.

Amphoras.   c. 150-100 BC.

A Dr. 1A wreck was discovered in 1974. Two amphoras have been published, but no other material or information.

Liou, 1975: 596-7.

**POINTE POMÈGUES**                                 **850**                                 Map 5                                 France

43° 15' N. 5° 17' E. At the SW. point of Pomègues island (Marseilles bay). Depth: 20 m.

Amphoras.   c. 100 BC.

A large ship, laden with Dr. 1A amphoras from central or southern Italy, sank at the beginning of the 1st century BC. The wreck also contained coarse-ware, Camp. A & B pottery, a lamp, and a bronze pan with a swan terminal.

Lequément, 1985: 117; DRASM, 1983: nos 266-9; Pollino, 1984: 61.

See also **Caveaux** and **Pomègues**.

**POMÈGUES A**   **851**                                 Map 5                                 France

43° 16' N. 5° 18' E. In the Calanque de l'Âne, on the E. side of Pomègues island (Marseilles bay). Depth: 3-7 m.

No cargo.   3rd century AD.

Part of a ship's hull was found by accident in 1975, cleared and recorded. The wood was partly overlain by ballast of small, black basalt pebbles. Finds included fragments of at least twelve amphoras, among which was a Gaulish amphora (type Laubenheimer G4); nuts were also found, lying on the hull. Ship-board items included a pottery medallion, a lamp, and three coins; of these last, one was a sestertius of Antoninus Pius (dated AD 145-161), and another a middle bronze of Philip I (AD 245-9), struck at Laodicea in Syria. A bronze

disc was probably part of a pulley. The hull (of which the keel was missing) was of typical shell-first construction, using treenails; it was pitched internally. The planking and frames were of Bosnia pine, a fragment of ceiling was of fir, and there were treenails of cypress, olive and pine. Widespread carbonization indicated that the ship had been destroyed by fire.

Gassend, 1978a.

**POMÈGUES B** 852 Map 5 France

43° 15' N. 5° 17' E. Off Pomègues island; 80 m SW. of Cap Caveau. Depth: 52 m.

Amphoras. 2nd or 1st century BC.

A brief report refers to a wreck of Dr. 2-4 amphoras, bearing graffiti (**CANTISX** on neck, **ON** on body). From the same site is said to have come a Campanian cup, form Lam. 27. It is highly unlikely that these finds were in fact from the same wreck, since Lam. 27 cups are datable to the 3rd or 2nd century BC, but western Dr. 2-4 amphoras are not known to pre-date the mid 1st century BC.

Benoit, 1960: 41.

See also **Calanque de l'Âne, Caveaux, Pointe Debie and Pointe Pomègues.**

**POMMEROEUL A-F** 853-858 Map 15 Belgium

50° 27' N. 3° 43' E. Five Roman boats were found, silted up, in the former river-harbour at Pommeroeul (between Tournai and Mons) and excavated in 1975. A sixth, in the bend of the R. Haine nearby, was destroyed unrecorded. Finds from the 1975 excavations included pole ferrules and boathooks, stone weights or anchors, and a possible sounding-stone. Of wrecks A-E, four were abandoned c. AD 50-150, the fifth c. AD 150-225.

**A.** A fragment of a boat, comprising two planks and two rib fragments. The planking had been repaired with iron plates.

**B.** Extended logboat, found before the official excavations. 1 m wide; the log section was reinforced with L-shaped ribs.

**C.** Boat made up of a log (with added pieces) amidships, and, at one end, log-derived L-shaped chine-timbers, plus other planks (cf. **Zwammerdam B**, etc.). This boat had originally been 11½ or 12 m long and 0.98 m wide; it was reinforced by ribs and iron nails.

**D.** Barge, almost 3 m wide, originally 18-20 m long. Made up of L-shaped chine-timbers with inserted strakes, caulked with cord, and reinforced with L-shaped ribs in pairs. There was a gangplank (for punting) along the starboard gunwale. In the stern was a cabin, of oak and pine planking.

**E.** Part of a barge, similar to D, but with the bottom planking nailed together; the chine-timbers were heightened by an extra strake.

**F.** Dugout, approx. 15 m long, almost completely filled with pottery, destroyed by canal works in 1976. Date, etc., unknown.

De Boe, 1978.

**POMONTE** **859** Map 7 Italy

42° 43' N. 10° 5' E. 1 mile SW. of Pomonte, at the SW. point of Elba; material brought up by fishermen. Depth: approx. 100 m.

Amphoras and pottery. 1st century BC-1st century AD (?).

A large quantity of vases, jugs and amphoras (said to be 1st century BC or AD), together with pieces of timber, is reported to have been found by fishermen. No details are known.

Zecchini, 1971: 186; 1982: 81 ('probable wreck').

**POMORJE A & B** **860-861** Map 1 Bulgaria

42° 33' N. 27° 39' E. Near Pomorje; detailed location unknown.

**A.** Amphoras. 5th-6th centuries AD (?).

**B.** Tiles. 5th-6th centuries AD (?).

Two Byzantine wrecks have been summarily reported.

Lazarov, 1985: 138.

### **Pompeii (Italy)**

The area of Pompeii by the R. Sarno was occupied by sailors and fishermen, whose net-weights, netting needles, anchors, boat-fittings, etc., were recovered in 19th-century excavations, but there are no useful records of boats as such.

Sogliano, 1901.

**POMPOSA** **862** Map 8 Italy

44° 38' N. 12° 10' E. At Bosco Spada, 2 km NNW. of Pomposa; silted and found in a drainage canal.

No cargo. Medieval or post-medieval.

Only scanty information is available of a sewn boat, found and destroyed without record in 1922. A witness estimated the boat as 50 m long by 10 m beam, which (even allowing for some exaggeration) represents a large vessel indeed. No dating evidence was reported, though the timbers (thought to be oak and pine)

appeared old. A good deal of rigging was found with the boat, suggesting (as one would suppose from her size) that she was propelled principally by sail.

Alfieri, 1968: 207; Bonino, 1968: 209; Berti, 1986b: 24.

**PONTE D'ORO** **863** Map 7 Italy

42° 56' N. 10° 34' E. On the beach of Ponte d'oro, between Piombino and Torre del Sale (E. of the promontory of Piombino); depth not reported.

Amphoras. Mid 1st century AD (?).

Material from off Ponte d'Oro includes Dr. 2-4, Haltern 70, Dr. 7-11, Camulodunum 186 and Dr. 20 amphoras which could all have formed part of a single cargo (cf. **Chiessi**, **Port-Vendres B**, etc.).

Massa, 1985.

**PONTELAGOSCURO** **864** Map 8 Italy

44° 53' N. 11° 37' E. A lagoon boat, found in clay-digging near the mouth of the R. Po.

No cargo. Late Roman or early medieval.

A broad, flat boat was found in a clay-pit in 1953; a portion 7 m long was saved. The planks were originally assembled with wooden treenails. There was no associated dating evidence.

Berti, 1986b: 24-5 (with refs).

**PONZA A, B & C** **865-867** Map 9 Italy

40° 52' N. 12° 58' E. (approx.). At uncertain locations on Isola di Ponza; depth not reported.

A. Graeco-Italic amphoras. c. 300-250 BC (?).

B. Graeco-Italic amphoras. c. 175-150 BC (?).

C. Dr. 1B amphoras. 1st century BC.

No details are known of these wreck sites on Ponza.

Gianfrotta, 1986: 218-9.

See also **Ponza Porto** and **Secca dei Mattoni**.

**PONZA PORTO** **868** Map 9 Italy

40° 53' N. 12° 57' E. In the harbour of Isola di Ponza. Depth: 11 m.

No cargo.

1st-2nd centuries AD (?).

Dredging works in the harbour in 1984 cut through and partly destroyed the timbers of an early Imperial ship. The wreck extended over an area of approx. 30 x 10 m.

Gianfrotta, 1986: 219-222.

**POPULONIA**

**869**

Map 7

Italy

42° 59' N. 10° 29' E. In the channel area of the ancient port of Populonia. Depth: shallow.

No cargo.

1st-2nd centuries AD.

A brief report states that an early Imperial wreck was found in 1974 in the channel N. of the breakwater at Populonia. Part of a floor timber was recovered.

Excavation in another underwater area found timbers which were at first thought to be from an Etruscan ship, but were in fact the remains of a quay or breakwater.

McCann & Oleson, 1974: 401; McCann et al., 1977: 286-8; Lamboglia, 1974: 170-5.

**POROS**

**870**

Map 13

Greece

37° 31' N. 23° 29' E. Close to cliffs on the N. side of Cape Dana (Poros); on a steep slope. Depth: 10-25 m.

Amphoras.

c. 500-480 BC.

Although scattered, this deposit was clearly a wreck; the main area of debris measured 18 x 23 m, and more lay under sand at the foot of the slope. The main type of amphora is not exactly paralleled, though it has some resemblance to early 5th century Samian amphoras. Other amphoras (though not raised or illustrated in the publication) are probably Chian, of late 6th-early 5th century form. Unfortunately the survey was left unfinished, and it appears that no further work has taken place at the site.

Stavrolakes & McKernan, 1975.

Porquerolles: see **Giens, Gros Mur, Jaumegarde**, etc.

Port-Cros: see **La Palu & Pointe de la Galère**.

**PORT-DE-BOUC**

**871**

Map 4

France

43° 23' N. 4° 59' E. At the entrance to Port-de-Bouc, near Les Saintes-Maries-de-la-Mer; discovered under more than 6 m of sand by a dredger. Depth: shallow.

Stone and other cargo. 2nd-1st centuries BC (?).

Material brought up from this site included a Corinthian capital, a Hellenistic sarcophagus, a lead anchor-stock, and some of the ship's frames. The date is far from certain.

Benoit, 1952b: 258-60; Diolé, 1954: 169.

**PORT-LA-NOUVELLE** 872 Map 4 France

42° 43' N. 3° 36' E. (approx.). About 35 miles SE. of Port-la-Nouvelle; in deep water.

Amphoras. c. AD 1-250.

A trawler brought up three amphoras and fragments of others, all of form Dr. 20, which must represent a wreck.

Gallet de Santerre, 1964: 481-2. (Mistaken identification by Fonquerle, 1972: 62).

**PORT-MIOU** 873 Map 5 France

43° 12' N. 5° 30' E. W. of Cassis; in sand, at the foot of cliffs. Depth: 30 m.

Amphoras, pottery and lamps. c. AD 400-425.

Though no timbers were found, and the only description of the site states that the material was scattered without obvious pattern, it is clear that this was a shipwreck. Over 50 pieces of t.s. chiara D and 17 lamps, also of N. African origin, were recorded; of the amphoras which were also in the wreck, only one has survived and been published (a cylindrical amphora). The site is well dated to the first quarter of the 5th century, possibly the second quarter, by the pottery.

Tchernia, 1969: 483; Deneauve, 1972; Liou, 1975: 585; Williams, 1981; Tortorella, 1981.

**PORT-VENDRES A** 874 Map 4 France

42° 31' N. 3° 6' E. 'Port-Vendres I', in L'Anse Gerbal; close to shore. Depth: 5-6 m.

Amphoras. c. AD 400.

The well-preserved shipwreck, though damaged by dredging, was completely excavated by Y. Chevalier and the DRASM; the hull was raised without dismantling the keel. Harbour debris of later periods overlay the wreck deposit, and some

of the material originally published as from the wreck is in fact intrusive. The cargo had consisted of amphoras of forms Almagro 50 and 51C; many were still stopped with corks, and inside were fish-bones, all of Sardina pilchardus (22-25 cm long) except for two Belone belone, which is normally found alongside sardines. There were Latin graffiti on some of the amphoras, which rested on dunnage of heather and vine branches, and were held upright by wooden frames.

Shipboard items included several amphoras: one was flat-bottomed, in a grey fabric, which is hard to parallel (cf. Robinson, M 230; or, perhaps more likely, the flat-bottomed amphoras from **Sud-Lavezzi A**); other, fragmentary amphoras (of more or less cylindrical form) were also found. There was at least one lamp, some pottery, and 68 small bronze coins, closing AD 383-392; one (of Constantine, dated AD 313-317) was found in the mast-step. Nautical equipment included a bone marline-spike, a wooden carpenter's rule, needles (some with an eye, some without), a fish-hook and a fishing-weight. Personal items found comprise pins, a brooch, part of a bone flute, three gaming dice and eight counters.

The hull was well-preserved, and is being studied in detail. The keel was very heavy (35 cm tall x 28 cm wide); several frames were bolted to it, but most were left unattached. The limber holes still had, passing along the ship, a rope to help sweep out the bilge. About 30 wooden rings mixed up with ropes are now understood to have belonged to a chain-pump like that from Los **Ullastres** (Foerster, 1984). Other rigging pieces found include a large, 6-sheaved block (probably from the yard hoist), a 9-sheaved block (perhaps mounted on deck as a rope-guide) and a 3-sheaved block (probably from one end of the yard). There was also a belaying-pin. Treenails and copper nails were used to fasten the garboards to the keel; the planking was fastened to the frames by treenails. The tenons which assembled the planking were spaced at intervals of 6 to 15 cm, and the seams were caulked with tow. Internal features included a thick ceiling, comprising alternate stringers and planks, and the positions for stanchions (of which two actually survived in part). The ship's maximum beam was approx. 8 m, and the overall length 18-20 m; she could have carried 70-75 tonnes of cargo. With a draught laden of some 2.2-2.3 m, she could have ascended the Tiber to Rome, or used most small coastal ports. The hull was symmetrical fore-and-aft; like that of La **Luque B**, it appears to represent a western Mediterranean development in the direction of skeleton construction, though not so marked as in the **Yassi Ada B** ship. Though full interim reports have been published, a major report is to appear in due course.

Gallet de Santerre, 1964: 475-6; Chevalier, 1968; Chevalier & Santamaria, 1972; 1973; Chevalier & Liou, 1974a; 1974b; Liou, 1974b; 1975: 571-3; Martin, 1977; Gassend, 1980; 1982: fig. 29; DRASM, 1983: nos 400-425; 1985: 78; Carre, 1983: 64 & 159.

#### **PORT-VENDRES B**

**875**

Map 4

France

42° 31' N. 3° 6' E. 'Port-Vendres II', situated 35 m from shore at the S. entrance to the harbour of Port-Vendres; the wreck, discovered in 1972, was buried under modern debris and sea-grass. Depth: 6-7 m.

Amphoras, pottery, ingots and glass.

c. AD 42-48.

Excavation of this rich Claudian site by D. Colls continued till 1984; a monograph interim report has been published. Several dozen Dr. 20 amphoras with 21 stamps from 11 potteries form an important group; so do 15 or more amphoras of form Haltern 70, unstamped, and some of form Dr. 28. All three forms were

labelled with painted inscriptions; the first two had pottery stoppers, the second and third were lined with pitch. Altogether the names of eleven shippers can be made out, some of them on both Dr. 20 and Dr. 28 amphoras, thus establishing that both types came from Baetica. Five different olive-oil producing estates are named on the Dr. 20 amphoras. The Haltern 70 amphoras contained defrutum. Pottery on board included 'red-varnish' and fine-wall ware of southern Spanish origin, possibly being carried as part of the cargo; the cargo also included 18 tin ingots, all inscribed. Two copper and three (inscribed) lead ingots were also presumably part of the cargo. A number of glass fragments includes two bowls, similar to those found at **Cavallo A**, which may also have been exports from Spain.

Shipboard items included a touch-stone, a lamp (together with three lamp fragments), some two dozen pieces of terra sigillata (Arretine and S. Gaulish), coarseware and vessel-glass. The S. Gaulish terra sigillata was new, and must have been acquired from a supplier in Spain, not from a dealer in Gaul. Metalware includes a tin cup, several bronze skillets, plates and pots, and two strigils (with maker's marks). An Iberian bronze coin of Iltirida (Ilerda) suggests contact with NE. Spain, though there is no need to posit a call en route. About ten amphoras of form Beltrán 2A, with painted inscriptions, may include part of a cargo consignment; they contained numerous fish-bones (identified as mackerel, Scomber colias) which were found adhering to the lining, confirming that such amphoras conveyed fish-sauce. One amphora bore the graffito **PSC**, which was also found on several of the coarse pottery vessels, and must indicate the name of an individual, presumably the ship's master; this amphora must have been, not cargo, but part of the stores for use on board. Some almonds found on the site doubtless also represent food eaten on board. A bone spoon and a boxwood box containing five fish-hooks complete the list of personal equipment so far reported.

Few details of the remains of the hull have been published. Several frames survived, together with copper nails, lead sheathing, a pulley and a yard (?). The ship appears to have been carrying three iron anchors when she sank. Abundant pieces of heather probably represent dunnage. She was evidently a large ship.

The date of the wreck is firmly established by the stamp of L(ucius) Val(erius) Aug(ustae) L(ibertus) a com(mentariis), which appears on twelve of the tin ingots, and cannot be earlier than AD 41/2, when his mistress, the empress Valeria Messalina, received the title Augusta. Other indications (e.g. the shape of the Dr. 20 amphoras) are that the wreck cannot be more than a few years later than this date. The conjunction of amphoras and ingots, especially the tin ingots, is an important document of trade at this period.

Colls et al., 1975; 1977; Mantas, 1980; Parker & Price, 1981; Colls & Lequément, 1980; Amar & Liou, 1984: nos 124, 172, 199, 205, 213, 220 & 245; DRASM, 1985: 67; Liou & Pomey, 1985: 551; Hesnard et al., 1988: 92; Martínez, 1989.

Information: B. Liou.

**PORT-VENDRES C**

**876**

Map 4

France

42° 31' N. 3° 6' E. 'Port-Vendres 3' (or 'III'); partly overlying wreck B.

Amphoras.

Mid 2nd century AD.

A cargo of Gaulish amphoras has been excavated by D. Colls. The amphoras, of form Laubenheimer G4, in many cases bear a graffito on the shoulder; one retained its cork stopper. There was also a pear-shaped amphora from Etruria,



whether cargo or stores. About 30 tangled iron blades (80 cm long) were found; these might be swords, or other forged bars, but some at least are very probably barrel-hoops. Shipboard items include terra sigillata and S. Gaulish coarse-ware, a stamped lamp, several glass bottles and a Luna marble mortar. Four coins (of Hadrian (2), Faustina the Elder and Faustina the Younger) date the wreck to the mid 2nd century. Unusual finds were the foot of a bronze vase, with a winged figure, and a 12 cm long figurine of an African Black Rhinoceros (perhaps of Gallic make). Some timbers found at the site are now known to be 17th or 18th century, contrary to an earlier report which assigned them to this wreck.

Liou & Marichal, 1978: 179; DRASM, 1983: nos 359-65; 1985: 71-2; Laubenheimer, 1985: 265; Liou & Pomey, 1985: 551-3; Manacorda, 1987: 48; Colls *et al.*, 1985; 1988.

**PORT-VENDRES D**

**877**

Map 4

France

42° 31' N. 3° 6' E. 'Port-Vendres 4'; in the S. part of the harbour. Depth: 4 m.

Amphoras and dolia. c. 50 BC-AD 25 (?).

A deposit of Pascual 1 amphoras is thought to be a wreck. Amphoras stamped **AM**, **CHR** and **S** (retrograde) + **TH** were found. There was also a dolium with a circular clay bung, secured by lead; the lead is inscribed (in Greek) dipso, 'I am thirsty'.

Corsi-Sciallano & Liou, 1985: 114; Liou & Pomey, 1985: 553; Liou, 1987b: 274.

**PORT-VENDRES E**

**878**

Map 4

France

42° 31' N. 3° 6' E. 'Port-Vendres 5'; in the harbour entrance. Depth: 16 m.

Amphoras. c. 50 BC-AD 25 (?).

A wreck with incomplete amphoras, probably of form Pascual 1, was discovered in 1984; a later report mentions Dr. 2-4 amphoras as well. Other finds were fragments of roof tiles, an oil lamp and some lead sheathing. This is perhaps the wreck 'La Moresque' listed by Miró.

Liou, 1987b: 274; Miró, 1987: 261; Pomey *et al.*, 1989: 2; Martínez Maganto *et al.*, 1989: 47.

**Port-Vendres: other finds**

Amphoras, anchor-stocks, etc., were reported from unspecified locations near Port-Vendres in Gallia, 12 (1954): 410 and II Congr. Arch. Sottomarina: 199-218.

**PORTICELLO**

**879**

Map 11

Italy

38° 14' N. 15° 40' E. On the Italian side of the Straits of Messina; on a rock and sand bottom, 200 m from shore. Depth: 33-37 m.

Amphoras, bronze statues, lead ingots, etc.  
c. 425-400 BC (?).

The cargo is mainly known from material recovered by police from looters, who had removed most of it before archaeologists arrived on the scene. The wreck was excavated by D. Owen and C.J. Eiseman; the final report has now been published. The amphoras were from Mende, from somewhere else in the Bosphorus region (perhaps Byzantium), from S. Italy ('West Greece'; perhaps Locri Epizephyrii) and from the Punic world (W. Sicily, according to Empereur & Garlan). Some were pitched internally, and, according to the looters, some were actually full of pitch when found. Wine was produced at Mende, and may have been the contents of the Mendean amphoras. There were originally more than 20 lead ingots, but only two now survive; one is loaf-shaped and bears a stamp ( $\Sigma\text{H}$  in ligature, impressed six times), probably a producer's mark. Analysis suggests that the ingots, as well as the ship's lead patching or sheathing, originated in the Laurion mines of Attica. Also part of the cargo (and found among the amphoras) were some small pots, about 10 cm in diameter, which are thought to have carried ink in either paste or liquid form.

Fragments of at least three life-size statues were found; it seems probable that they were originally intact, though one fragment, of a foot, retains part of a lead attachment by which (for a time, anyway) the figure had been mounted on a base. The statues were one draped and two undraped male figures; the surviving head, at first thought to be a philosopher and perhaps even Socrates, is more likely a mythological being, just possibly Chiron with the young Achilles and other youthful heroes. Rather than the 4th century, as earlier proposed (e.g. by Eiseman, 1980: 153), the stylistic date of these statues (according to Ridgway) is between 450 and 420 BC, most closely 440-430 BC.

Shipboard equipment included lead bars which formed part of two anchors; three bronze arm casings were also found. Analysis of the lead showed it probably did not originate in Attica. There was also a large lead ring. An iron awl with a wooden handle was found in the stern area; so, too, was a wooden bobbin or toggle which was perhaps originally attached to a sail. In the stern, too, were found fishing-weights, as well as four small cake-ingots and 122 nuggets of lead and silver (15-25% silver) which were found together in a small area and had probably originally been in a basket or bag. Few domestic utensils were found - three (perhaps four) black-gloss cups, a mortarium, a jug and several cooking-pots; there were also two black-gloss lamps, two whetstones, a small wooden bowl and just one sheep/goat bone. These finds came mostly from the N. end of the site, indicating the stern; the anchors were found in the centre and at the S. end, presumably the bow.

Little survived of the ship's structure, but some details have been established. A fragment of a strake shows that the hull was closely tenoned; the planking tenons were fixed by treenails. Strakes and frames were fastened by clenched copper nails. Unclenched copper nails were also found. The copper nails were distributed over an area of seabed some 26 m long, and the hull has accordingly been estimated (using comparative data from Kyrenia) at about 17 m long, with a capacity of about 30 tons burden. Pieces of lead sheet were found, probably from patches rather than a complete sheath. An unusual detail which was preserved is a wooden cleat, 21 cm long. Three samples of wood were dated by  $C_{14}$ ; one date is some 1,000 years too late, but the other two are thought to indicate that the ship was built in the mid-late 5th century BC (Eiseman & Ridgway, p. 25). The date of the wreck is by no means well established. The excavators prefer a late 5th or early 4th century date (cf. Eiseman & Ridgway, p. 33), though the Greek amphoras could be as late as c. 375 BC (C.G. Koehler, pers. info.); however, the lamps, the cup-skyphos and the two 'bolsals' (cups)

are not later than the late 5th century, even c. 430-425 BC (Gill, 1987; Cerdá, D. in Arribas *et al.*, 1987: 470). If the dating of Greek amphoras based on rubbish deposits at Athens and Corinth is perhaps too late, one might think that the date of the Porticello wreck could be placed fairly close to the stylistic date of the sculptures, say in the years 425-415 BC.

Eiseman & Ridgway, 1987. Cf. Gill, 1987 & 1988; Empereur & Garlan, 1987: 108. See also: Owen, 1970; 1971; Eiseman, 1973; 1975a; 1975b; 1979a; 1979b.

**PORTO AZZURRO A**                                **880**                                Map 7                                Italy

42° 45' N. 10° 24' E. In the harbour of Porto Azzurro (Elba); in shallow water not far from the N. side of the harbour.

Amphoras and pottery.                                c. AD 250-300.

A wreck of the mid-late 3rd century AD lay under a 90 cm thick layer of mud and sherds. A survey by the CSAS in 1976 and 1977 found ship's timbers in situ, with, lying on them, Afr. 2D amphoras and t.s. chiara. The full survey report (by F. Pallarés) is unpublished, but has been drawn upon by the later authors cited. Bombing, dredging and ships' propellers have fragmented and redeposited a good deal of material in the harbour, but this wreck at least is certain.

Magrini, 1976; Gandolfi, 1982: 409; Tortorella, 1981: 361; Zecchini, 1982: 97-127; Pallarés, 1983c; 1983f.

**PORTO AZZURRO B**                                **881**                                Map 7                                Italy

42° 45' N. 10° 24' E. In the harbour of Porto Azzurro; closer to the quay than wreck A.

Amphoras and other material.                                c. AD 50-100 (?).

Material recovered from Porto Azzurro included a substantial quantity of amphoras (Dr. 10, Dr. 2-4, Tripolitana I, etc.), lamps, and Italian and S. Gaulish terra sigillata, datable in the latter half of the 1st century AD. Given the disturbed nature of the site, this cannot be definitely classed as a wreck deposit, but Zecchini (drawing on unpublished reports by M. Chioffi and F. Pallarés) makes a good case for thinking that it could be. Possibly the wreck, photographed in 1963 and later destroyed, which was briefly reported by Lamboglia, was this site. The coins mentioned by Lamboglia may be identified with a sestertius of Agrippina the Elder (AD 37-41) reported by Zecchini.

Lamboglia, 1974: 179; Zecchini, 1982: 97-127; Pallarés, 1983c; 1983f.

**PORTO BADISCO**                                **882**                                Map 10                                Italy

40° 4' N. 18° 29' E. At Porto Badisco, near Otranto; the wreck, sometimes called 'La Pietra Mesola', lies close to the rocky coast. Depth: 33-38 m.

Amphoras and mill-stones.                                c. 60-40 BC.

The ship appears to have hit the coast and sunk intact; the bottom is rocky, and of the hull only the keel survived, held down by concreted amphoras, mill-stones and anchors. The amphoras included Apulian and Lam. 2 forms. A heap of mill-stones (not recorded in detail) was clearly also part of the cargo. The cargo covered some 300 m<sup>2</sup>, of which about half was surveyed by N. Lamboglia in 1973. Two anchors were still in situ, one iron (about 4 m long), the other lead-stocked. The keel was fastened to the floors by at least one metal rivet, but no detailed drawings of it have been published.

Lamboglia, 1974: 163-5; Capodarte et al., 1974: 73; Tchernia et al., 1978: note 19.

**PORTO CESAREO** **883** Map 10 Italy

40° 15' N. 17° 53' E. Off Porto Cesareo; detailed location and depth not reported.

Amphoras. 12th-13th centuries AD.

A wreck with amphoras resembling Günsenin forms 1-3, but probably of western origin, has been summarily reported.

D'Andria, 1979: 226 & pl. C.

Porto Cesareo: see also **Torre Chianca**.

**PORTO CHELI** **884** Map 13 Greece

37° 18' N. 23° 11' E. Near Porto Cheli (Limin Kheliou) in the Peloponnese. Depth: 4-7 m.

Amphoras. 6th century AD (?).

Ballast stones and amphoras were mingled in a pile; the amphoras are of globular form. Also found was part of a jug in coarse grey ware.

Unpublished.

Information: D. Wood; P.R. Sealey.

**PORTO CRISTO A** **885** Map 3 Spain

39° 32' N. 3° 20' E. At the mouth of Porto Cristo (Majorca); the wreck lay ensanded on a beach, in shallow water.

Lamps. c. AD 50-70.

The cargo included many different kinds of mould-made pottery lamps, from the Italian factory of C. Clodius (Bailey, 1978: 93). The contents of the ship were almost entirely dispersed after its discovery; plates, pots and small amphoras were also present, but may have been shipboard equipment, not cargo. Some bronze keys and coins (including a sestertius of Caligula) were also found;

so, too, were a Dr. 2-4 amphora, a barbotine-decorated beaker, and S. Gaulish terra sigillata. The hull was well-preserved, to a length of 20-30 m; no details are recorded, except that it was sheathed in lead. It appears that some of the material attributed to **Conillera** by Falcon-Barker came from this site.

Mascaró, 1962 (cf. 1971); Domergue, 1966a; 1968.

Information: D.M. Bailey.

**PORTO CRISTO B** **886** Map 3 Spain

39° 32' N. 3° 20' E. In E. Majorca; exact location not reported.

Amphoras. c. AD 25-100 (?).

A cargo of Haltern 70 and Dr. 20 amphoras has been summarily reported.

Colls et al., 1977: 37.

#### **Porto Cristo: other sites**

The cargoes of at least three other Roman ships lie in the harbour of Porto Cristo, according to O. Frey (1970), who gives only summary information. In view of the sheltered nature of the harbour, these are perhaps rubbish deposits rather than wrecks.

**PORTO ERCOLE A** **887** Map 7 Italy

42° 23' N. 11° 12' E. SW. of Porto Ercole (Etruria); detailed location and depth not reported.

Amphoras. c. 150-100 BC (?).

A wreck with a cargo of Dr. 1A, Apulian, Punic and Greek amphoras, investigated by N. Lamboglia, has been only briefly reported. Finds also included a lead anchor-stock decorated with knucklebone signs.

Rendini, P. in Martelli et al., 1982: 43-4.

**PORTO ERCOLE B** **888** Map 7 Italy

42° 22' N. 11° 13' E. SE. of Porto Ercole islet. Depth not reported.

Amphoras. c. 150-100 BC (?).

A much-looted wreck, 30-33 m long, had a cargo of Dr. 1A amphoras (presumably 2nd century BC, pace Rendini). Other finds included a stone mill, and two bronze lampstands, doubtless part of the ship's furniture. A lead anchor-stock, and copper (as well as lead) sheathing, 'from the prow', were also found.

Papò, 1964; Kapitän & Fallico, 1967: 96; Rendini, P. in Martelli et al., 1982: 43-4.

### **Porto Ercole**

A Roman dolium, stamped **CASSIVS** | **CAHI C S F**, found off the Tuscan coast by fishermen, could represent a wreck.

Rendini, P. in Martelli et al., 1982: 53; Gianfrotta & Hesnard, 1987: 289.

### **Porto Ghermeno (Greece)**

Two supposedly pre-Roman amphoras were brought up by fishermen off Porto Ghermeno in the E. part of the Gulf of Corinth.

Touchais, 1987: 527 (from press reports).

### **PORTO LONGO** **889** Map 1 Greece

36° 45' N. 21° 42' E. In Porto Longo, Sapienza island (near Methone), towards the S. end of the harbour. Depth not reported.

Amphoras (?). c. AD 400-650 (?).

Visual search of Porto Longo produced finds 'probably from three wrecks' of which one was Byzantine (Throckmorton, p. 39). The site is no. 14, 'Byzantine potsherds' in the list published by Frey.

Throckmorton, 1970b; Frey, 1972.

Porto Maurizio: see **Imperia**.

### **PORTO PAGLIA** **890** Map 6 Italy

41° 8' N. 9° 32' E. (approx.). Near Porto Cervo (NE. Sardinia); detailed location not reported. Depth: shallow.

Dolia (?). 1st century BC-1st century AD ?

Some 100 fragments of a large dolium stamped **L.F.P** were recovered in 1978. Also on the site were found Roman pottery and an iron anchor. These remains most likely represent a wreck, though its main cargo (if any) may be yet to be identified.

Boninu, 1986: 59.

**PORTO PALO**                                        **891**                                        Map 11                                        Italy  
36° 39' N. 15° 8' E. (approx.). Near Porto Palo (Sicily); detailed location and depth not reported.

Amphoras.                                        c. 150-1 BC.

A wreck of Lam. 2 amphoras was recently discovered near Porto Palo.

Unpublished.

Information: B. Basile (Giardini Naxos, 1991).

**PORTO PÍSTIS**                                        **892**                                        Map 6                                        Italy  
39° 32' N. 8° 26' E. (?). In W. Sardinia, location not determined. Depth: 6 m.

Lead ingots.                                        AD 117-138.

A cargo of lead ingots was found in 1987; several were saved, but at least 40 are said to have been looted. The ingots were inscribed **IMP.CAES.HADR.AVG**, with their weight on the side.

Agus, 1990: 454-5 & pl. IV.

**PORTO SANTO STEFANO**                                        **893**                                        Map 7                                        Italy  
42° 26' N. 11° 7' E. (approx.). Off Porto Santo Stefano, on the N. side of Monte Argentario; detailed location and depth not reported.

Amphoras.                                        Date unknown.

Almost nothing is known about a wreck from which some amphoras were raised in 1963.

Rendini, P. in Martelli et al., 1982: 43.

Porto Santo Stefano (Sardinia): see **Capo Carbonara**.

**PORTO VENERE**                                        **894**                                        Map 7                                        Italy  
44° 2' N. 9° 50' E. In Porto Venere, Luni; close to land, off Locanda S. Pietro. Depth: 4-8 m.

Tiles (?).                                        Late 3rd-early 2nd century BC.

A detailed survey of the flat seabed revealed a mound, approximately 1 m high, and, beside it and extending under it, a dense scatter of tiles. These comprised tegulae and imbrices of large module, and also antefixes decorated with a palmette design of 'Romano-Etruscan' type. The date is based principally

on parallels for the antefix design. No excavation of the site has taken place, and the tiles might have been part of the ship's structure; however, they are more appropriate to a temple, and may in fact have been on their way to adorn a temple in the area.

Lamboglia, 1965; Pallarés, 1977a: 34-5; Bernardini, 1984.

### **Portoferraio (Italy)**

Two 1st century AD ships, said by Lamboglia (1974: 184) to have been located at Portoferraio (Elba), have not been reported elsewhere. For a wreck in this vicinity, see **Capo Enfola**.

### **PORTOMAGGIORE**

**895**

Map 8

Italy

44° 40' N. 11° 50' E. (approx.). Near Portomaggiore; found in a silted-up branch of the R. Po.

No cargo (?).

c. 500-250 BC (?).

A dugout, discovered in construction work in 1907, was associated with human skeletons and painted pottery, thought to be Attic. Unfortunately no details of the boat or of the finds survive.

Alfieri, 1968: 191-2.

### **POSILLIPO**

**896**

Map 9

Italy

40° 45' N. 14° 13' E. (approx.). Off Posillipo (Napoli); detailed location not reported. Depth: 5 m.

No cargo (?).

Greek or Roman period.

Press notices refer to the discovery of 'an ancient galleon' off Posillipo. Remains of the wooden hull, with bronze nails, and of pottery and shipboard utensils were found.

Gandolfi, 1985b: 666.

### **POVILE**

**897**

Map 8

Croatia

45° 7' N. 14° 49' E. (?). Near Novi Vinodolski. Depth: 19 m.

Amphoras.

Late 3rd-4th centuries AD (?).

Various reports have been published which refer to a late Roman site at Povile, 'near Novi Vinodolski'. Investigations at various times have produced cylindrical amphoras and what seems to be a globular amphora, as well as over 25 amphoras, said by Matejčić to be of forms Afr. 2A and 2C. Her report illustrates an Afr. 2B and a cylindrical amphora, and does not describe the site



as a wreck; however, the number of amphoras found suggests that there may be an African cargo at this site, as well as stray amphoras.

Dautova-Ruševljan, 1970 (nos VI, VIII & IX); Vrsalović, 1974: 53 & 240; Matejčić, 1976: 353-5.

**POZZINO**

**898**

Map 7

Italy

43° 0' N. 10° 30' E. (approx.). In Baratti bay (q.v.), 200 m from the coast; under a thick bed of sea-grass. (Sometimes identified as 'Baratti B', without reference to a site 'A'). Depth not reported.

Amphoras, pottery, metal, glass and other cargo.  
c. 120-80 BC (?).

A rich cargo was discovered in 1974, but not reported till after excavations (under various directors, including E. Riccardi and E. Ciabatti) began in 1982. The cargo amphoras were of form Dr. 1A, perhaps of Campanian manufacture; there was also at least one Rhodian amphora, and numerous lagynoi, one bearing a monogram stamp. There was also a great quantity of Camp. A pottery, many fusiform unguentaria, and four stacked cups of greenish glass, cast and ground. A further cargo consignment, unparalleled, consisted of collyrium and spices (not yet identified, but smelling of cinnamon, vanilla and cumin); the spices were packed in small wooden cylinders with wooden lids, fitted in groups of three into tin (or pewter) and wooden containers, and in rectangular wooden boxes, perhaps with sliding lids. 136 wooden cylinders have been found, of two varieties of box-wood. There were also cups, filter jugs and a small amphora in tin (or pewter), found associated with traces of a wooden chest. Several vine branches (*Vitis vinifera*) were found, and some olive pits and nut shells. Other finds were a silver balsamarium and the left hand of an ivory-and-wood statue, possibly of Aesculapius. A bronze cupping vessel and an iron scalpel suggest the presence of a doctor. A range of coarse pottery and a lava mortarium were in use aboard. Links with the E. Mediterranean are indicated by pieces of relief-decorated and West Slope ware. The assemblage bears a resemblance with that of **Spargi**; the date given is tentative, pending more excavation and study. The ship's hull, estimated at 15-18 m long, is well-preserved; it was of slender form, with widely-spaced frames measuring only 6 x 8 or 8 x 8 cm in section but with rather thick planking and ceiling. Two cross-beams were found. The assembly treenails were pierced with copper nails; the external lead sheathing was damaged, and pieces of used lead sheathing (folded up) were found on board. A cavity in the ceiling amidships, which may have housed the foot of the mast, shows axe-blows, possibly indicating salvage; it may be, too, that the objects found, which seem to have been loaded in a confused order, are themselves salvage from another ship, wrecked previously.

Calabri, 1982; Gandolfi, 1982: 403; Ciabatti et al., 1989.

Information: G. Kapitän; F. Nicosia.

**Pozzuoli (Italy)**

Unconfirmed rumours allege that there are several wrecks off Pozzuoli and Baia, but in view of the certain submergence of large areas of ancient settlement in that area these have been discounted. See, however, **Bacoli**.

**PRAIANO****899**

Map 9

Italy

40° 35' N. 14° 30' E. (approx.). Three miles off the Amalfi coast, between Praiano and Positano; depth not reported.

Amphoras. Roman period.

Little is known of a wreck off Praiano; Roman amphoras of various forms (especially Afr. 1 and 2) have been found in the area, but none can be definitely attributed to this site.

Romito, 1989.

**PRASSO****900**

Map 13

Greece

38° 31' N. 26° 11' E. At Prasso Islands, NE. of Khios; on the NE. point of the islands, Site A of Garnett & Boardman. Depth: shallow.

Amphoras. 5th-7th centuries AD.

A 'cemented deposit' of globular amphoras (Riley LR2) was found by snorkel search.

Garnett & Boardman, 1961: 107-112, no. 38.

Another amphora deposit, Prasso Site F, is mentioned by Garnett & Boardman, but without any details.

**PREMUDA A****901**

Map 8

Croatia

44° 19' N. 14° 39' E. (?). On Premuda island, probably on the E. side. Depth: 30-60 m (?).

Amphoras. 1st century AD (?).

A wreck of Dr. 6A amphoras on Premuda was briefly published by Brusić. What could well be the same site is referred to by Orlić & Jurisić as at 'Premuda, Grebeni', with Lam. 2 amphoras, lying in 30-60 m on rocks.

Brusić, 1980: 159-60, 166; Orlić & Jurisić, 1986b: 50.

**PREMUDA B****902**

Map 8

Croatia

44° 20' N. 14° 35' E. (?). Probably at Masarine islet, on the W. side of Premuda; depth not reported.

Amphoras. 5th-7th centuries AD (?).

Globular amphoras, no doubt Byzantine, were raised from a wreck off Premuda in 1960.

Brusić, 1980: 162.



An astonishingly well-preserved ship was discovered in 1967 by G. Brambilla, though the locals had previously taken away many 'loaves' of sulphur from the wreck and used them for treating their vines. A thorough survey took place in 1969, but the ship has not been completely excavated or raised. One surviving sulphur ingot bears the stamp [M]ODEST[I]; this is not a known Sicilian stamp, and the origin of the sulphur may be closer to Elba. Also on board were amphoras, some pear-shaped (from Gaul ?), of which one was stamped MATVR[I], and others of form Afr. 1. The African amphoras, sealed with 'pozzolana' stoppers, contained fig-seeds, and had presumably been originally at least partly full of figs; one, however, held an unidentified yellow substance. There were also numerous fragments of glass, mostly colourless, which included many shell-shaped 'buttons'; these may well have been cargo.

Finds of roof-tiles showed that the ship had been provided with a cabin roof aft. Other shipboard items included a jar full of olives, lamps, a coarse-ware casserole, fine-wall cup fragments, an ivory stopper (carved with Bacchus and Pan), the imprint of a glass bottle or jug (decorated with a gilt ray and diamond pattern), and fragments of several mortaria. A larchwood box contained 10 kg of huntite (a fine white powder), probably originally magnesium before immersion in the sea; this mineral was used in antiquity as a pigment, and possibly also in medicine. Some ropes, and a coiled-up hawser, also survived.

The ship was preserved for much of her length (over 18 m), and to deck level on one side. She was lead sheathed, and fastened with treenails and copper nails; the planking was of *Picea* sp., the ceiling of fir, the frames and stringers (?) of elm. C<sub>14</sub> dates of ad 140±50 to ad 350±50 can be fitted only uneasily to the clear archaeological date. Graphical reconstruction of the hull indicates that the ship would have required ballast: a quantity of granite balls and iron slag was found in the hull, and there could have been sand ballast as well. The amphoras, coarse pottery and other items concur to fix the date of the wreck in the latter part of the 2nd century AD, probably c. AD 180. The cause of the loss is unknown; the ship sank with her bows to seaward, in the attitude of ships anchored in Procchio Bay today.

Zecchini, 1982: 133-68 & pls 37-53. See also: Fioravanti, 1973; Barbieri *et al.*, 1974; Martelli *et al.*, 1982: 68-71; Gianfrotta & Pomey, 1981: 136.

**PROCIDA** **907** Map 9 Italy

40° 45' N. 14° 1' E. (approx.). Off Procida island (near Pozzuoli); on a weed and sand bottom, 200-300 m from the rocky shore of an unspecified bay. Depth: 25 m.

Amphoras. c. 150-25 BC (?).

Dr. 1 amphoras, raised by a local diver on more than one occasion, must be from a wreck, although there is no detailed information available about the underwater site.

Unpublished.

Information: G. Kapitän.

**PUDDING-PAN ROCK** **908** Map 15 Britain

51° 28' N. 1° 9' E. Off Whitstable (Kent); the 'rock' is a shoal, 10 km NE. of Whitstable, which is 2 m deep at low spring tide.

Pottery. AD 175-200.

The cargo, of plain terra sigillata from Lezoux, included vessels of at least nine forms, with the stamps of more than 40 potters. Underwater investigations have failed to locate the actual wreck, though its general position is known. Roman tiles found in the area may also come from the wreck.

Smith, 1907-9; Hartley, 1972; Dean, 1984.

**PUDRIMEL NORTE** 909 Map 2 Spain

37° 41' N. 0° 42' W. (approx.). On the N. side of Cabo de Palos; detailed location and depth not reported.

Amphoras. c. AD 50-150 (?).

A brief report mentions a cargo of Dr. 14 amphoras, but the accompanying illustration shows one of form Beltrán 2B.

Más, 1985a: 164-5.

**PUDRIMEL SUR** 910 Map 2 Spain

37° 40' N. 0° 42' W. (approx.). Detailed location and depth not reported.

Amphoras and pottery. c. 150-50 BC (?).

A wreck with a cargo of Dr. 1C amphoras and Camp. A and fine-wall pottery has been briefly reported.

Más, 1985a: 162-3.

**PUEBLA DEL RÍO** 911 Map 2 Spain

37° 15' N. 6° 2' W. Silted in a bank of the R. Guadalquivir at Puebla del Río, 15 km SSW. of Seville; the boat lay beneath 4.4 m of alluvium.

No cargo. Medieval ?

A river-boat with pointed stern was revealed in a bank of the river in 1970. Only the keel and several planks were preserved; the boat is thought to have been about 10 m long and 1.22 m wide. At the stern was a deposit of stony material which could well have been ballast. First reports suggested the boat was Roman, but Menanteau & Pou prefer an 11th-12th century date. The remains were burnt in 1974.

Abad, 1975: 82-3; Menanteau & Pou, 1978: 185 & n. 26.

Pula: see **Nora**.

'Punic Ship': see **Marsala**.

**PUNTA ALA**

**912**

Map 7

Italy

42° 47' N. 10° 44' E. In the harbour of Punta Ala, near Castiglione della Pescaia. Depth: 2 m.

Amphoras and dolia.

c. AD 250 (?).

A Roman ship was found accidentally during harbour construction, and prompt intervention saved three-quarters of the hull for excavation by the CSAS. The cargo comprised Dr. 20 amphoras (one stamped **LCFSCVFM** retrograde) from Spain, as well as Afr. 2B-D and pear-shaped amphoras, possibly North African. Fragments of dolia were also found (one marked **LXIIXS**); the deposit on one included pollen, mostly herbaceous, and including 2.9% *Vitis vinifera*, grape vine. T.s. chiara C & D and rilled-bottom ware apparently also belonged to the cargo. Two coin hoards were found, one of them between the ceiling and the ship's bottom; the coins were sestertii, including Gordian (Rev. Astarte in temple) and Philip (?).

The ship must have been some 25 m long. She was shell-built in the traditional way with tenoned planking and alternating floors and half-frames, but the planking, frames and stringers were fastened by long, square iron rivets, driven through the assembly from outside, and clenched and covered with lead inside the hull. It appears that the heads of the rivets were sealed with a drop of tallow. The bows were slender, and the bottom apparently rather flat; the foremast step and (apparently) the foot of the foremast were preserved. Ferrandi considers that the substantial stringers (one of which was set into the frames just outboard of the centre-line) were necessary to give solidity to an only partly-decked ship. In the bows (aft of the seventh frame) a pipe, made up of terracotta sections (the so-called 'vaulting tubes') each 20 cm long and 5-6 cm in diameter, was found, lying between the frames and extending into the bilge at the end. Ferrandi interprets this as a means of collecting water from the foredeck into the bilge; the evidence of pumps in other wrecks, as well as common sense, suggests rather that the pipe served (or helped) to pump water out of the bilge and over the side. It is not clear from the published account whether the top end of the pipe was actually preserved.

Arobba, 1976; Ferrandi, 1980; Lamboglia & Pallarés, 1983a.

Information: F. Pallarés (Lipari, 1976).

**PUNTA ALTARELLA**

**913**

Map 11

Italy

37° 59' N. 12° 21' E. Off Punta Altarella, in the SE. part of Levanzo (Egadi Islands). Depth: 47 m.

Amphoras and pottery (?).

Roman period.

A Roman wreck with amphoras and pottery has been reported, without further details.

Purpura, 1986: 150, no. 64.

See also **Cala Mindola**.

Punta Bandiera: see **Capo di Torre Cavallo**.

**PUNTA BLANCA** 914 Map 4 Spain

42° 19' N. 3° 19' E. (approx.). A wreck on Cap de Creus (Catalonia); location and depth not reported.

Amphoras. c. 50 BC-AD 25 (?).

A wreck with Pascual 1 amphoras has been summarily reported. For similar wrecks in this area, see **Cala Cativa**, **Cap de Creus** and **Culip A & C**.

Nieto, 1986: 82.

**PUNTA BRACETTO** 915 Map 11 Italy

36° 48' N. 14° 28' E. On the S. side of Punta Braccetto (Sicily); in shallow water close to land.

Amphoras. Early 5th century BC (?).

A recently-found wreck produced some Corinthian type A amphoras, an askos, a lamp and a helmet of Corinthian type. The amphoras appear to be 5th century BC, rather than 6th century as first reported.

Wilson, 1988: 116.

Information: G. Kapitän.

Punta Cavallo: see **Punta della Contessa B**.

**PUNTA CERA** 916 Map 7 Italy

42° 45' N. 10° 25' E. Near Porto Azzurro (Elba); on a sandy bottom, 200 m from the bay formed by the small headland called Punta Cera. Depth: 35 m.

Amphoras. c. AD 200-275 (?).

A much-looted wreck with a cargo originally of as many as 2,000 or more amphoras at one time extended over an area not less than 16 x 14 m, or, according to one report, 25 x 10 m. The amphoras were of Afr. 2A form; some were stamped, but only one stamp (**CPC**) has survived. According to an investigation by the CSAS, this was the only form of amphora on board, but it seems there were pear-shaped amphoras and probably Afr. 1 amphoras as well. Shipboard pottery

(including a coarseware plate, a grey-ware jug and a dark-walled casserole) do not, unfortunately, provide a precise date; the wreck is perhaps earlier than the date proposed by Rossi (cf. the similar cargo of **Plemmirio B**). No equipment or hull remains (other than copper nails) were recovered.

Zecchini, 1971: 121-2 ('Capo Caldo'); Rossi, D. in Martelli et al., 1982: 83-5; Gandolfi, 1982: 409.

**PUNTA CHIAPPA** **917** Map 7 Italy

44° 19' N. 9° 8' E. Off the dangerous headland of Punta (della) Chiappa, near Portofino; a 'field of amphoras'. Depth: 45 m.

Amphoras. c. 150-25 BC (?).

No details of the wreck or its cargo of Dr. 1 amphoras have been reported, other than a brief note.

Lamboglia, 1971a: 190-1.

**PUNTA CRAPAZZA** **918** Map 11 Italy

38° 26' N. 14° 57' E. At Punta Crapazza, the S. point of Lipari; depth not reported.

Tin ingots. 3rd century AD?

A wreck with tin ingots was investigated by A. Freschi in 1990; she referred to it in an early report (unpublished) as 'Late Roman-Byzantine', but the ingots are displayed alongside Afr. 1 amphoras in the Museo Eoliano, and so may date rather from the Middle Empire in fact. The ingots are elongated, loaf-shaped, with a convex top and flat base.

Unpublished.

Information: A. Freschi; U. Spigo (Giardini Naxos 1991).

**PUNTA DE ALGAS** **919** Map 2 Spain

37° 48' N. 0° 43' W. Near San Pedro del Pinatar (NE. of Cartagena). Depth: 3-6 m.

Amphoras and pottery. c. 100-50 BC (?).

The cargo of the wreck is fairly coherent, despite the shallow site, exposed to strong swells; the cargo spread suggests that the ship measured approx. 30 m long. Excavations under J. Más have accounted for some 500-700 amphoras, a rather modest load of some 25-35 tons (contra the 150-200 tonnes calculated by Mas). The amphoras are of form Lam. 2; many are stamped in Latin with names of Greek or servile origin (eg. **PLATO**, **NICIA**, **SIRA**, etc.), and sometimes counter-stamped with a design of Victory in an oval frame. They were sealed with mortar seals, stamped **L.VIBI.L.C.L.LVC**; analysis of the mortar revealed no material of



volcanic origin such as would indicate a central Italian source. The seal held in place a stopper of terracotta; the amphoras contained a residue of an aromatic pitch-like substance derived from balsam, which it is suggested was intended for use as an additive to wine, and is distinct from the lower quality substances used to line the inside of amphoras. Large quantities of black-gloss ware were also found, apparently, therefore, part of the cargo. This is described as having characteristics of Camp. C, but transitional (i.e. to early terra sigillata). Shipboard items are reported to have included tools, though only one, a mallet, has been published. The ship's hull was lead-sheathed; some fragments of the timbers have been found, but not reported in any detail.

Más, 1970; 1977.

**PUNTA DE LA MONA**                                        **920**                                        Map 2                                        Spain

36° 43' N. 3° 43' W. West of Almuñécar. Depth: 80 m.

Amphoras.                                        c. AD 175-250 (?).

Two Dr. 20 amphoras, said to be of late 2nd-3rd century type, were trawled up off Punta de la Mona, and are thought to come from a wreck.

Molina, 1983.

For another site at Punta de la Mona, see **Cueva del Jarro**.

Punta de la Nao: see **Cádiz B, E & F**.

**PUNTA DEI MANGANI**                                        **921**                                        Map 7                                        Italy

42° 50' N. 10° 23' E. (?). In Elba; just off Punta dei Mangani. Depth: 55 m.

Amphoras.                                        1st century BC-2nd century AD.

An uninvestigated Roman wreck is said to lie in an area from which unspecified amphoras of different periods have come. This site is not mentioned in recent accounts of Elba.

Zecchini, 1971: 186.

**PUNTA DEI RIPALTI A**                                        **922**                                        Map 7                                        Italy

42° 41' N. 10° 25' E. Off Punta dei Ripalti, SE. Elba. Depth: 35-40 m.

Amphoras.                                        6th-4th centuries BC (?).

A probable wreck with scattered amphoras, probably Etruscan, has been briefly reported.

Pallarés, 1983b: 183, no. 41.

- PUNTA DEI RIPALTI B**                                **923**                                Map 7                                Italy  
 42° 41' N. 10° 25' E. Near wreck A. Depth: 40-42 m.  
 Amphoras.    c. 150-1 BC (?).  
 A probable wreck with 'Republican' amphoras and pottery has been briefly reported.  
 Pallarés, 1983b: 183, no. 142.
- PUNTA DEL DIAVOLO**                                **924**                                Map 1                                Italy  
 42° 6' N. 15° 29' E. At the S. point of San Domino island (Tremiti islands); close to **Tre Senghe**, q.v. Depth: 21 m.  
 Building stone.                                        Medieval (?).  
 A cargo of limestone blocks of varying size remains fairly intact, in four layers. No evidence of date has been reported; Ruegg suggests 'Roman or medieval', De Juliis 'probably medieval'.  
 Ruegg, 1971: no. 5; De Juliis, 1982.
- PUNTA DEL FENAIO**                                **925**                                Map 7                                Italy  
 42° 23' N. 10° 52' E. At Punta del Fenaio (or Fienaiio), the N. point of Giglio island. Depth: 60-75 m.  
 Amphoras and vaulting tubes.                    c. AD 200-325 (?).  
 Only a brief survey (by M. Bound) has been possible on a much-looted site at the N. end of Giglio. The main cargo was of Afr. 2B amphoras; there were also a large number of small terracotta vaulting tubes. Some iron nails may also have been cargo. Other finds include a lead fishing-weight (unused) and a bronze ship's nail. Hull timbers survive in situ.  
 Bound, 1987.
- PUNTA DEL MILAGRO**                                **926**                                Map 4                                Spain  
 41° 6' N. 1° 14' E. (approx.). Near Tarragona; detailed location and depth not reported.  
 Stone.    Roman period.  
 Column drums and other remains of a Roman ship were raised from this site before 1959, but no further details have been published.  
 Ripoll, 1961a: 21.

**PUNTA DEL MORTO A & B**                      **927-928**                      Map 7                      Italy

42° 23' N. 10° 53' E. At the N. point of Giglio island. Depth: 40 m.

**A.** Amphoras.                                      3rd-2nd centuries BC (?).

**B.** Amphoras.                                      c. AD 70-220 (?).

A cascade of broken amphoras in a rock gully represents at least two wrecked cargoes. One is of Graeco-Italic amphoras, the other of pear-shaped amphoras of Gallic type. There appears, however, to be no substantial deposit of amphoras like one, inscribed **X** before firing, which was earlier identified as Massiliot.

McKee, 1968: 113-8; Bound, 1988c: 192.

**PUNTA DEL VAPOR A**                      **929**                      Map 2                      Spain

36° 43' N. 3° 43' W. In the bay of Almuñécar (Granada); detailed location and depth not reported.

Amphoras.                                      1st century AD.

Amphoras of two Baetican forms (from among Dr. 7-11) were reported from a wreck here by Beltrán, but this is not confirmed by Pascual, who mentions only wreck B.

Beltrán, 1970: 408 & fig. 164. 81; Pascual, 1973.

**PUNTA DEL VAPOR B**                      **930**                      Map 2                      Spain

36° 43' N. 3° 43' W. Location as wreck A.

Amphoras.                                      3rd century BC.

A Punic amphora cargo was wrecked at Punta del Vapor, and five amphoras, Mañá type E, have been recorded. A Red-Polish plate of 3rd century form was also found. No details of the site, and only one amphora, have been published.

Pascual, 1973: 118 & fig. 11 C.

**PUNTA DEL VAPORE**                      **931**                      Map 1                      Italy

42° 6' N. 15° 29' E. On the W. side of San Domino (Tremiti islands); on sand, at the foot of a cliff. Depth: 24-25 m.

Amphoras.                                      c. 300-250 BC (?).

Only fragmentary amphoras have been published from a wreck with an early Graeco-Italic cargo. Some (if not all) of the amphoras were stamped on the handles in Latin, **ANTIP.R** and **CA.T.R**; there is said to have been a Greek stamp, too. Earlier reports suggested that the amphoras were of Lam. 2 form, but the

identification as Graeco-Italic (by De Juliis) is more authoritative. The wreck, described in 1970 as 'thoroughly robbed', yielded only a few amphoras in a more recent survey; the ship's side planking, however, remained in situ under sand.

Ruegg, 1971: no. 3; De Juliis, 1981.

**PUNTA DELL'ARCO**                                      **932**                                      Map 9                                      Italy

40° 46' N. 13° 24' E. At the S. point of Ventotene island; on a sandy bottom. Depth: 42-54 m.

Amphoras and lead ingots.                      c. 100-50 BC.

A cargo of Dr. 1B amphoras was discovered at Punta dell'Arco. There were also 14 lead ingots, apparently all marked with dolphin - **C.VTIVS.C.F** - caduceus (cf. **Punta Falcone**, **Madrague de Giens** and **Capo Testa B**). The ship's bottom, well-preserved, lies buried in the sand; copper nails were used in its construction.

Gandolfi, 1985b: 678-9; Gianfrotta, 1986: 216.

See also **Ventotene**.

**PUNTA DELLA CONTESSA A**                                      **933**                                      Map 10                                      Italy

40° 36' N. 18° 2' E. (approx.). Between Punta della Contessa and Torre Cavallo (near Brindisi); detailed location not reported. Depth: 15 m.

Amphoras.    c. 100-25 BC (?).

The presence of a shipwreck is only implicit in the published account, but seems likely. The amphoras are of form Lam. 2 (referred to as Dr. 6 in reports), and one is stamped **A-PR**. Lead anchor-stocks were also found.

Sciarra, 1973: 343-5; 1985: 145.

See also **Capo di Torre Cavallo**.

**PUNTA DELLA CONTESSA B**                                      **934**                                      Map 10                                      Italy

40° 39' N. 18° 1' E. (approx.). At Punta della Contessa; detailed location and depth not reported.

Lead ingots.    1st century AD (?).

A cargo of lead ingots was found near Brindisi; two ingots were recovered. Both of these (and, apparently, all the rest) bore the device of a crayfish, without any inscription. The origin and date of the cargo can, therefore, only be guessed at.

Sciarra, 1982: 129; 1985: Lam. II.

Punta della Falconara: see **Punta Falconaia**.

**PUNTA DELLA MADONNA** 935 Map 7 Italy

42° 48' N. 10° 10' E. In NW. Elba; detailed location and depth not reported.

Amphoras. c. 175-75 BC (?).

Dr. 1A amphoras from Punta della Madonna probably represent a wreck there.

Pallarés, 1983B: 182 no. 14 (citing G. Brambilla).

**PUNTA DI SAN FRANCESCO** 936 Map 11 Italy

38° 29' N. 14° 58' E. Off the S. headland of the main easterly bay of Lipari (Aeolian Islands); depth not reported.

Amphoras. 4th-2nd centuries BC.

A wreck of Punic amphoras (Mañá A 3/4) is known mainly from finds brought in by Club Méditerranée divers. An inspection of the site by D. Frey found some contamination with Roman and later material. One of the earlier finds was an amphora (op. cit., infra, fig. 31) which C. Albore Livadie considers an example of the 1st century AD form Richborough 527, and, with mention of some more fragments from the site, has been published as a form specimen by Arthur (1989b); however, neither the colour nor the inclusions nor the external finish match that form, and, though the present writer has not been able to find a parallel, it must in fact be a Punic amphora. This rather unusual site would repay further examination.

Bernabò-Brea & Cavalier, 1985: 52-3; Arthur, 1989b.

Punta di Torre Cavallo: see **Capo di Torre Cavallo**.

**PUNTA ENTINA** 937 Map 2 Spain

36° 45' N. 2° 5' W. (?). Said to be between Punta de la Media Naranja and Cabo de Gata (Murcia); the place-name has not been traced, assuming it is not Punta de las Entinas (sv. **Gandolfo**) which lies well to W. of Cabo de Gata. Depth not reported.

Amphoras. c. AD 1-150 (?).

Only a summary report has been published of a wreck with amphoras of form Dr. 14.

Domergue & Más, 1983: 915.

**PUNTA FALCONAIA****938**

Map 7

Italy

42° 49' N. 10° 21' E. On the N. coast of Elba, E. of Portoferraio. Depth: 20-35 m.

Amphoras. 2nd-3rd centuries AD (?).

A completely robbed wreck of pearshape amphoras ('Dr. 30') has been briefly reported.

Pallarés, 1983b, no. 63 (citing G. Brambilla).

**PUNTA FALCONE****939**

Map 6

Italy

40° 58' N. 8° 14' E. (approx.). Three miles from Punta Falcone (Sardinia); on a rocky bottom. Depth: 20 m.

Lead ingots. c. 100-25 BC (?).

No details have been reported of a late Republican wreck at the NW. tip of Sardinia. 16 lead ingots have been preserved; they are of rounded shape, marked **C.VTIVS.C.F** - dolphin.

Tylecote *et al.*, 1983: 73; Lo Schiavo & Boninu, 1985: 141; Gianfrotta, 1985a: 156 & fig. 1; Boninu, 1986: 57.

Information: R.F. Tylecote.

**Punta Giutgiu (Italy)**

Off Punta Giutgiu, the SW. point of Lampedusa Porto, a survey by Aquarius revealed Dr. 1B, Dr.6 and Lam. 2 amphoras, as well as late Roman and modern material.

Panvini, 1991: 194.

**PUNTA GLAVINA A****940**

Map 8

Croatia

44° 42' N. 14° 52' E. At the S. point of Rab (Arve) island; 50 m from the coast. Depth: 16-20 m.

Amphoras. c. 100-25 BC (?).

A cargo of Lam. 2 amphoras lay a little scattered over an area 25 x 15 m, with a dense concentration in an area 10 x 6 m. A precautionary excavation in 1970 raised part of the cargo. The amphoras are of two main types, with some variations; several are stamped, e.g. **TVTIV** (on one handle) **VI[ ]** (on the other), and **Ω** (on one handle, the other illegible). No other finds or dating evidence are reported.

Dautova-Ruševljan, 1975.

**PUNTA GLAVINA B****941**

Map 8

Croatia

44° 42' N. 14° 52' E. (approx.). Somewhere near wreck A; detailed location and depth not reported.

Amphoras. Roman (early Imperial ?).

The cargo of this wreck (only briefly reported) comprised amphoras of an unusual, elongated pear-shaped form - perhaps a local development of Dr. 1?

Unpublished.

Information: R. Matejčić (Lipari, 1976).

**PUNTA GLAVINA C****942**

Map 8

Croatia

44° 42' N. 14° 52' E. (approx.). Somewhere near wreck A; detailed location and depth not reported.

Amphoras. c. 175 BC (?).

A wreck with a cargo of Graeco-Italic amphoras (similar to those of **Chrétienne C**) has been briefly reported. No details have been given, except that a lead anchor-stock was found at the site. (It is just possible that this is the same site as **Pernat B**, but the circumstantial description of the latter makes confusion unlikely).

Unpublished.

Information: R. Matejčić (Lipari, 1976).

**PUNTA JAVANA****943**

Map 2

Spain

36° 53' N. 1° 57' W. At Isleta de Punta Javana (or Punta Isleta), Almería. Depth not reported.

Amphoras. 1st-2nd centuries AD (?).

Only a summary report has been published of a wreck with a cargo of 'Imperial Hispanic amphoras'.

Domergue & Más, 1983: 915.

**PUNTA LAZZARETTO****944**

Map 7

Italy

42° 22' N. 10° 55' E. Off Punta, or Torre, Lazzaretto, also called Punta Gabbianera (or Gabbianara), on the E. side of Giglio island. Depth: 14-36 m.

Amphoras. c. 200-150 BC (?).

An area 60 x 30 m, strewn with amphora sherds, from which both amphoras and anchors have been looted, certainly contains the remains of a Graeco-Italic

amphora cargo. There is also considerable contamination with both Roman and medieval material, but it is not possible to say if this represents other wrecks at the same site.

Zecchini, 1971: 194; Rendini, P. in Martelli et al., 1982: 51.

Information: R. Hale; J. Towse; M.A. Haigh.

**PUNTA LE TOMBE** **945** Map 7 Italy

42° 44' N. 10° 7' E. Close to Punta le Tombe, at the SW. point of Elba. Depth: 50 m (?).

Amphoras. 1st century AD (?).

An uninvestigated Roman wreck, with 1st century AD amphoras nearby, is said to lie off this point. No other details have been reported.

Zecchini, 1971: 187; listed under 'stray finds' by Zecchini, 1982: 81; said to lie in 60-70 m, 1 mile from the coast, by Pallarés, 1983b: 182, no. 27.

**PUNTA LEONA** **946** Map 2 Morocco

35° 55' N. 5° 23' W. Close to Punta Leona, on the S. side of the Straits of Gibraltar; on a steeply-sloping cliff-face, caught between the cliff and a jutting rock. Depth: 44 m.

Amphoras. 3rd century BC (?).

A small deposit of Punic amphoras, form Mañá A4, was found at Punta Leona; there may be more material not yet discovered. A sketch of the amphoras suggests a date in the 3rd century BC, perhaps earlier (cf. Ramón, 1981: fig. 4. 3-4). No associated finds have been reported.

Unpublished.

Information: F.A.J. Denham.

**PUNTA LICOSA** **947** Map 9 Italy

40° 15' N. 14° 55' E. Off Punta Licosa, at the S. end of the gulf of Salerno. Depth: 30 m.

Amphoras. c. 150-25 BC.

A wreck concealed beneath 50 cm of sea-grass had a cargo of Dr. 1C amphoras (described as 'Graeco-Italic'). Lead tubing was also found on the site, and, nearby, a lead anchor stock.

Picchetti, 1989.



Punta Luccia: see **Vulcano**.

**PUNTA NERA** **948** Map 7 Italy  
42° 44' N. 10° 25' E. Off Punta Nera, Capoliveri (SE. Elba); depth not reported.

Amphoras. Roman period (?).

A wreck with amphoras of unstated form was recorded by the CSAS in 1963, and then repeatedly looted.

Monaco, G., in Fasti Archaeologici 17, 1962: 298, no. 4252; Pallarés, 1983b: 183, no. 45 (citing G. Brambilla).

**PUNTA PALOM** **949** Map 4 Spain

41° 57' N. 3° 13' E. (approx.). Near Bagur, in the bay of Sa Tuna; at a place called Coll del Gorg (or El Gorg), on the N. side of Punta Palom. Depth: 10-20 m.

Amphoras. 1st century BC (?).

The cargo of Iberian amphoras lay scattered on an underwater cliff-slope. The amphoras were of several varieties of form Mañá B3; they were probably made locally. There were also fragments of Dr. 1 amphoras, which indicate a 1st century BC date for the wreck.

Foerster, 1974a; 1974b; 1978b; Miró, 1983-4.

**PUNTA PATEDDA** **950** Map 10 Italy

40° 40' N. 17° 55' E. (?). In the vicinity of Brindisi, at Punta Patedda (not located - perhaps the same as Punta Padella, 1.2 km W. of Punta Penne). Depth not reported.

Amphoras and pottery. c. 15 BC-AD 20.

Little information is available about this shipwreck. The amphoras have not been described, but since they were apparently stamped **THEODORI** and **CAESTAI.IVCR** they were probably of Apulian or Lam. 2 form. From the wreck came bronze drinking-cups, fish-hooks, an ivory gaming die, and a pottery unguent flask (said to have borne a painted inscription in Greek, aosmos hagnos). Also found were about ten fine-wall pottery beakers; some were wheel-made, but most were of the moulded type known as ACO beakers, which in this case bore the marks of L. Norbanus of Cremona. There was also some Arretine pottery.

Following the initial discovery in 1969, attempts to find more material at this site have been unsuccessful. A pity, for it would be interesting to know more about the traffic in fine-wall ware, and, in particular, whether pottery by more than one maker was on board.

Jurlaro, 1972; Parker, 1974a; Lamboglia, 1974: 167-8; Sciarra, 1982: 128.

**PUNTA PENNE A** 951 Map 10 Italy  
40° 41' N. 17° 56' E. Between Torre Rossa and Case Bianche, near Brindisi; 1 km NW. of Case Bianche, 100 m from the coast. Depth: 12-15 m.

Amphoras. c. 150-25 BC (?).

A scattered cargo of Apulian amphoras included one stamped **DIOCLES** on a handle. No other finds have been reported.

Kapitän, 1972c; Uggeri, 1974; Sciarra, 1985: 144.

**PUNTA PENNE B** 952 Italy

40° 41' N. 17° 56' E. Near Punta Penne; 100 m from shore. Depth: 12 m.

Amphoras. c. AD 150-225 (?).

A wreck of amphoras lay scattered in relatively shallow water. The amphoras were flat-bottomed, form Pan. 41, as made at Forlimpopoli in NE. Italy, and especially frequent in the latter part of the 2nd century AD.

Kapitän, 1972c; Panella, 1974: 484; Sciarra, 1982: 125 & fig. 96; Tchernia, 1986: 258.

Information: G. Kapitän.

**PUNTA PERLA** 953 Map 7 Italy

42° 45' N. 10° 24' E. S. of Porto Azzurro (Elba). Depth: 30-35 m.

Amphoras. 1st century BC-AD (?).

Scattered amphoras of unstated form are thought by Pallarés to be a probable wreck.

Zecchini, 1971: 187; Pallarés, 1983b: 184, no. 46.

**PUNTA POLVERAIA** 954 Map 7 Italy

42° 47' N. 10° 6' E. 150 m off Punta Polveraia at the W. end of Elba. Depth: 25-50 m.

Amphoras. 1st century AD (?).

A probable wreck at Punta Polveraia produced Roman amphoras of unstated form, and two iron anchors (raised in 1962).

Zecchini, 1971: 187-8; Pallarés, 1983b: 182, no. 22.

**PUNTA POZZOLANA****955**

Map 11

Italy

36° 49' N. 11° 58' E. On the N. side of Pantelleria island; 80 m off the rocky coast. Depth: 20 m.

Amphoras. 2nd century BC (?).

A brief survey by N. Lamboglia in 1973 revealed many fragmentary amphoras, concreted to the rocks, and evidence for more under the sand lower down. A variety of amphora forms was noted, as at **Cala Gadir**; the wreck is thought to be of the same period.

Lamboglia, 1974: 160.

**PUNTA PRIMA****956**

Map 4

Spain

41° 48' N. 3° 4' E. 3 km NE. of San Felú de Guixols; on the Laja La Llosa, off Punta Prima (or Punta Rojiza). Depth: 18 m.

Amphoras. c. AD 70-100.

A probable wreck with a cargo of Dr. 10 amphoras has been briefly published. Two lead anchor-stocks (of different types) came from the same site, though they may not have been part of the wreck. Also from the wreck came a t.s. hispanica bowl, form Drag. 37 with almond-shaped rim. This form is found in late 1st-early 2nd century deposits on land; its apparent association here makes this a late find of Dr. 10 amphoras.

Esteva & Pascual, 1967; Pascual & Esteva, 1971.

**PUNTA RAISI****957**

Map 11

Italy

38° 15' N. 13° 6' E. (approx.). Off Punta Raisi (or Rais), W. of Palermo; in very deep water.

Amphoras and pottery. 1st-3rd centuries AD (?).

Fishing-boats have brought in amphoras and pottery from a site in deep water; the amphoras (apparently of form Panella 44-47) are probably of Roman Imperial rather than Byzantine date (cf. **Scialandro B**).

Purpura, 1986: 146, no. 40.

**PUNTA SALINA****958**

Map 4

Spain

42° 3' N. 3° 12' E. At the tip of Punta Salina, near Estartit; scattered on a rocky cliff-slope. Depth: 30m.

Amphoras. Mid 2nd century BC (?).

There were two kinds of cargo amphoras in this wreck, Graeco-Italic and Iberian. The Graeco-Italic amphoras were of at least two varieties, rosin-

lined; the Iberian amphoras, form Mañá B3, were made locally (as, according to Will, the others may also have been). A small, two-handled jar of Punic type and an Iberian jar were also found. The wreck is placed in the mid-late 2nd century by Miró.

Foerster & Pascual, 1971; Miró, 1983-4: 177. Possibly referred to by Benoit, 1965a: 56 ('San Felíu de Guixols').

**PUNTA SARDEGNA** **959** Map 6 Italy

41° 13' N. 9° 22' E. Said to be off Punta Sardegna in NE. Sardinia; detailed location and depth not reported.

Amphoras and stone columns. Early Roman Imperial (?).

A summary, unspecific report of a wreck refers to tons of sherds, 2,000 years old, and, a little way off, columns of Capo Testa granite. It is not clear if an underwater photo of broken amphoras is of this site.

Loppel, 1978: 56.

**PUNTA SCALETTA** **960** Map 7 Italy

42° 15' N. 11° 6' E. At the N. point of Giannutri island - often referred to as 'Giannutri' (but see also **Cala Scirocco**); on a sloping cliff-face, in a rocky bay. Depth: 33 m.

Pottery. c. 140-130 BC.

The cargo (excavated by N. Lamboglia in 1963) consisted of Camp. A black-gloss pottery (mostly plates, dishes, cups and bowls, together with some unguentaria) which lay in a layer up to 30 cm thick on the slope when found. The pottery had been stacked in piles; there may have been straw between each pot, though this is denied by Lamboglia. Typologically, it can be dated around the decade 140-130 BC; this date is confirmed by the 13 coins found at the site, which include one silver and three bronze coins of Neapolis, one bronze victoriolate, and one medium bronze of Ptolemy VI Philometor (181-146 BC).

Shipboard items included a tibia (shawm) of ivory, part of a lava mill, several roof-tiles, a stone ball, a lead horn, and an iron dagger. There were eight anchors, four iron and four lead-stocked. Also on board were some amphoras, of a very early type of Dr. 1A (classed as Graeco-Italic by Tchernia, 1986), and at least one of Apulian form. The coins thus provide important confirmation for the typological dating of 2nd century BC pottery and amphoras.

The ship's hull (built of oak) had come to rest on its starboard side, which was preserved to deck level. Unfortunately the timbers were not raised; the published plans show that the frames were of varied spacing and width, perhaps because the topsides and sterncastle were built differently from the main part of the hull. Fragments of the steering-oar outrigger were preserved, and a reconstruction of this assemblage has been published by Ferrandi (an isolated beam was previously interpreted by Lamboglia as part of a steering-oar). At the bow, at least two thicknesses of planking were observed. The hull was lead-sheathed.

Lamboglia, 1963; 1964b; Picozzi, 1974; Ferrandi, 1980; Morel, 1981: 63-4.

**PUNTA SCARIO A****961**

Map 11

Italy

37° 54' N. 12° 26' E. At the N. end of Isola Lunga, near Marsala; in sand, near the beach. Depth: 2-6 m.

Roof-tiles.

1st century AD (?).

A cargo of tiles lay on the remains of a ship, not far from the Punic wrecks of Marsala. This was certainly a very large wreck; only a brief investigation has been made. The tiles bore a circular Latin stamp, **TI.CL.FELIC. EX OFFICIN(A)**; there were floor-tiles, tegulae and imbrices, all stacked in piles. The stamp (Campanian?) may be earlier than the published date.

Kapitän, 1970; Purpura, 1986: 152, no. 75.

Information: H. Frost; G. Kapitän; M. Steinby.

**PUNTA SCARIO B****962**

Map 11

Italy

37° 54' N. 12° 26' E. Near wreck A; 500 m from the Punic ship. Depth: 6 m.

No cargo.

c. 225-150 BC (?).

A pile of ballast-stones on the sandy bottom off Isola Lunga was trenched by H. Frost; no remains of the ship were found, but a spearhead, probably of Greek type, came from within the pile. Nearby were an iron object, thought to be a corvus or grappling-iron, and a wooden anchor with a hole to insert the (missing) lead stock.

Frost, 1972; 1981: 16-18, 127 (fig. 63) &amp; 137.

**PUNTA SCARIO C****963**

Map 11

Italy

37° 53' N. 12° 26' E. The 'Edgerton' wreck, 200 m WNW. of the Punic Ship. Depth: shallow.

Amphoras.

1st century BC.

A cargo of Dr. 1B amphoras lay in sand; fragments were scattered as far as the Punic Ship, but the sub-bottom sonder survey showed that there was a sizeable deposit of amphoras buried in situ. Two Lam. 2 amphoras, found inshore of the site, may come from a wreck - perhaps this one.

Frost, 1981: 158 &amp; fig. 176; Falsone &amp; Bound, 1986: 164.

**PUNTA SCARIO D****964**

Map 11

Italy

37° 53' N. 12° 26' E. 1 km S. of the Punic Ship. Depth: shallow.

Amphoras.

c. 150-75 BC (?).

Sand dredging in 1969 revealed a wreck with early Dr. 1A amphoras. Finds included a stopper and part of a coarseware jar.

Kapitán, 1970; Frost, 1981: 282 & 292.

**PUNTA SCIFO A**

**965**

Map 1

Italy

39° 0' N. 17° 11' E. Near Crotone; the wreck lies several hundred metres from the coast, by a rocky reef among sand. Depth: 4-7 m.

Stone.

Early 3rd century AD.

The wreck was discovered and partly salvaged by commercial divers in 1908-9; some items have been brought ashore at other times, too. The cargo consisted of pavonazetto (purple-and-white) and white marble from Synnada (Docimium) in Phrygia, and some grey-and-white marble from Proconnesus in the Hellespont. The stone had been cut into columns (of pavonazetto), basins, blocks, capitals, bases, and even a statuary group of Cupid and Psyche. Consular dates of AD 197 and 200 cut on some of the columns and blocks provide a date for the wreck. The identification of the surviving marbles, and detailed study of them by P. Pensabene, raise questions about the ship's route. The Synnada marble might have been transported to Nicomedia, and there loaded aboard a freighter together with some pieces from Proconnesus; alternatively, the Synnada stone could have gone down the R. Meander to a port such as Miletus for transshipment. In the cargo wrecked at Punta Scifo, there were not only roughed-out pieces, but also half-finished and finished pieces, emphasizing that both provincial and Roman sculptors may be represented in works found at Rome even in the same imported stone.

The underwater site was described by the early 20th century divers, who said the blocks were spread over an area 50 x 50 m, 3 m thick, and in two sections, as if the ship had broken in two (cf. other marble cargoes, especially **Marzamemi A**). The pieces they raised were estimated to weigh over 150 tons; the largest raised was a rectangular block of approx. 22 tons, but an even larger piece was left on the bottom. Fragments of the ship's planking (of oak) and a frame (?) held treenails driven in and fixed by large iron nails; there were also fragments of lighter planking in another wood (fir?), fastened by tree-nails. Further work in 1983 by Aquarius revealed that the hull was 30-35 m long, and produced shipboard items, some of high quality, such as a bronze lamp with a base decorated with three dolphins. Some plaques of slate and marble could have been a sample selection to help with ordering. The earlier divers reported some broken amphoras.

Orsi, 1911; 1921; Lamboglia, 1974: 158-9; Pensabene, 1978; Donarini & Griva, 1983; Gandolfi, 1985b: 668; Mocchegiani, 1986: 164.

**PUNTA SCIFO B**

**966**

Map 1

Italy

39° 0' N. 17° 11' E. Nearer to Punta Scifo than wreck A; detailed location and depth not reported.

Amphoras.

3rd-2nd centuries BC.

A stone anchor-stock was found concreted to Roman amphoras of unstated form in a single dive by the CSAS.

Lamboglia, 1974: 159.

**Punta Secca, Lipari (Italy)**

A supposed 6th-century BC wreck mentioned by Lamboglia (II Congr. Int. Arch. Sottomarina (1971): 15) has not been confirmed in later reports and is probably a confusion with some other site.

**PUNTA SECCA A & B**    **967-968**    Map 11    Italy

36° 46' N. 14° 30' E. At Palmento, just W. of Punta Secca in S. Sicily; on the sandy shore, probably within an ancient harbour. Depth: 2-3 m.

No cargo.    c. AD 650-700.

Two well-preserved hulls were found exposed near the beach; from one came a 7th century Byzantine coin. It appears that both the hulls were mostly destroyed by souvenir-hunters.

Kapitän, 1972c.

Information: G. Kapitän.

**PUNTA SOTTILE A & B**    **969-970**    Map 1    Italy

35° 29' N. 12° 38' E. At the SE. tip of Lampedusa island, in sandy areas among sea-grass.

**A.** Amphoras.    c. 300-150 BC. Graeco-Italic amphoras with terracotta stoppers.

**B.** Amphoras.    c. 150-1 BC. Lam. 2 amphoras with terracotta stoppers; also remains of the hull, with lead sheathing.

Panvini, 1991: 194-6.

**PUNTA STILO**    **971**    Map 1    Italy

38° 26' N. 16° 35' E. Near Punta Stilo, Calabria; 100-150 m from the beach, NE. of Punta Stilo light. Depth: 5-7 m.

Stone.    6th-4th centuries BC ?

At least ten fluted column-drums of sandstone are known of a cargo which has yet to be thoroughly surveyed. Other stone blocks have been seen at the site, but no other finds or dating evidence have been reported. The column-drums are not unlike those of the nearby temple at Caulonia, but this resemblance can provide only the most tentative date for the shipwreck.

Casson, 1968; Gandolfi, 1982: 406.

Information: G. Kapitän.

**PUNTAS, LAS** 972 Map 2 Spain

36° 44' N. 3° 41' W. South of Almuñécar. Depth: 60-70 m.

Amphoras. c. AD 90-140.

A wreck with Dr. 20 amphoras is known from trawlers' finds. One amphora, probably from this site, is stamped **AGRICOL**.

Mendoza, 1979; Molina, 1983.

**QAWRA** 973 Map 12 Malta

35° 57' N. 14° 25' E. South of Qawra Point, Malta. Depth: 40 m.

Amphoras. c. AD 200-275 (?).

A widely-scattered deposit of Roman amphora fragments included a handle, stamped **O**, and an Afr. 2A neck. This appears to represent a 3rd century AD African cargo.

Scicluna, 1965; Parker, 1976: fig. 1, no. 5.

Rab: see **Punta Glavina**.

**RAF RAF** 974 Map 1 Tunisia

37° 11' N. 10° 12' E. On a sand and rock bottom near Raf Raf. Depth: not reported.

Amphoras. Late 2nd century BC (?).

Some material was recovered from an apparently scattered wreck in 1973. The amphoras included at least two of form Dr. 1C and one of Lam. 2, as well as two Punic amphoras, both of type Maña C but with differing length of neck (cf. **Cala Gadir**), and a one-handled flask. There were also a Punic amphora with collar-rim, and an ovoid amphora with a double bead-rim. Except for the last two types of amphora, this cargo assemblage can be paralleled in other wrecks such as **Cavalière** and **Colonia de Sant Jordi A**.



Unpublished.

Information: R.A. Yorke.

**RANDELLO**

**975**

Map 11

Italy

36° 51' N. 14° 27' E. At Randello, located between Camarina and Punta Braccetto, on the S. coast of Sicily; the wreck lies approx. 40 m from the water's edge, on firm sand. Depth: 2-3 m.

Amphoras.

Early 4th century AD (?).

A small ship, carrying a cargo of Almagro 50 amphoras, originating from the W. coast of Portugal, was wrecked on an exposed beach. The amphoras contained the remains of sardines. The cargo can scarcely have exceeded 150-200 amphoras, even allowing for salvage; there is no trace of any other cargo. The remains of three or four iron anchors, all incomplete or damaged, were found. Practically nothing (apart from some copper nails) remained of the ship; a few sherds of N. African amphoras suggest an early 4th century date.

Wheeler & Locker, 1985; Parker, 1989.

Information: G. D'Andrea; S.J. Keay.

**RAS ACHAKKAR**

**976**

Map 2

Morocco

35° 44' N. 5° 56' W. (approx.). On the N. side of Ras Achakkar, about 13 km SW. of Tangier; at the foot of a reef which can be seen at low tide. Depth: not reported.

Amphoras.

Roman period.

Numerous amphoras have been raised from the site, together with what is described as a 'Roman bushel tap'.

Ponsich, 1964: 262.

**RAS EL BASIT**

**977**

Map 1

Syria

35° 52' N. 35° 48' E. Near the ancient site known as Ras el Basit, 25 km S. of the mouth of the R. Orontes; detailed location and depth not reported.

Mortaria.

Mid 3rd-mid 4th century AD (?).

A cargo of large mortaria has been briefly reported. Some bore stamps, including **ALEXAN** | **DRILADA** (in Roman characters), and were no doubt made locally, at Ras el Basit.

Hayes, 1967: 342; Frost, 1969: 19; unpublished report.

**RATINO** 978 Map 6 France

41° 22' N. 9° 14' E. At Ratino reef, Bonifacio strait (Corsica); the known remains lie in a gully, 50 m S. of the reef. Depth: 6 m.

Amphoras. c.AD 325-350 (?).

Three amphoras of Afr. 2B type, found together in 1958, probably represent a wreck.

Zevi & Tchernia, 1969: 207; Bebko, 1971: no. 300.

**RATONNEAU** 979 Map 5 France

43° 17' N. 5° 18' E. (approx.). On the N. side of Ratonneau island, among sand and sea-grass. Depth: 25 m.

Amphoras. c. 200-140 BC.

A much-looted wreck, discovered by F. Carrazé in 1971, has a cargo of slender Graeco-Italic amphoras like those of La **Ciotat A**.

Pomey et al., 1989: 14.

**REDONA, NA** 980 Map 3 Spain

39° 10' N. 2° 59' E. NE. of Na Redona (or Rodona) island (Majorca). Depth: 33-35 m.

Amphoras and ingots of copper and tin.  
1st century AD.

Almost nothing is known of a once well-preserved wreck which lay in sand and sea-grass. There were at least 600 amphoras on board; just one has been published, of form Camulodunum 186A. Under the amphoras were tin ingots, said to be of 'half-orange' shape, and inscribed; after breaking up the pile with dynamite, the looters managed to collect 400 ingots, which they turned into 4 tons of scrap tin. There were also flat, circular ingots, of copper (though by some reports wrongly said to be of bronze). No illustration of the ingots has been published, and probably none exists.

The wanton destruction of this rich site is just one of such events in the Balearic islands. Unfortunately, in this case it took place in the earliest years of aqualung diving, and most of the material had disappeared before archaeological enthusiasts (such as D. Cerdá and C. Veny) could do anything to make records. Even the jejune account given here is derived mainly from divers' hearsay.

Mascaró, 1962: 179; 1967: no. 1465; Throckmorton, 1970a: 215; Cerdá, 1971: fig. 35 ('Pecio de Illa Rodona'); Laubenheimer-Leenhardt, 1973: 70.

Information: D. Cerdá.

**RHAMNOUS** **981** Map 13 Greece

38° 10' N. 24° 2' E. Between Rhamnous and Cape Phanari, on the E. coast of Attica; detailed location and depth unknown.

Amphoras. Date unknown.

A 'consignment of broken amphoras' reported from the Attic coast presumably represents a wreck, though no further information has been published.

Braemer & Marcadé, 1953.

**RHAPHINA** **982** Map 13 Greece

38° 1' N. 24° 0' E. (approx.). Near Rhaphina (Rhafína), on the E. coast of Attica; detailed location and depth not reported.

Amphoras. 1st century BC (?).

Two amphoras, now in an American collection, are said each to have been found in a shipwreck near Rhaphina. One is Coan, the other of uncertain type; both can be dated in the first century BC, and thus they may well derive from the same wreck (pace Hoffmann).

Hoffmann, 1971: nos 206-7.

Rhodes: see **Rhodos**, also **Akandia**, **Camirus**, **Kavo Vodi**, **Lindos**, **Pefkos**.

**RHODOS** **983** Map 13 Greece

36° 26' N. 28° 14' E. (approx.). In or near the harbour of Rhodes; detailed location and depth not reported.

Amphoras. Greek Classical period (?).

A wreck which was found by fishermen was subsequently investigated by the Greek underwater archaeology inspectorate, without any report of their findings.

Catling, 1983: 60.

**RHÔNE DELTA** **984** Map 4 France

43° 20' N. 4° 52' E. (?). At a location described only as 'towards the Rhône delta' or 'near the Camargue coast'; on a soft, muddy bottom. Depth: 17 m.

Stone blocks and sculpture. c. 20 BC (?).

An oyster-dredge brought up a colossal head of Augustus in Luna marble. The head measures 0.7 m high, and belongs to a statue which must have been 3-4 m tall. From the same area (a known net-fastening) came granite blocks, Dr. 2-4

amphoras and fragments of dolia. The marble head was new at the time of loss, and belongs stylistically with representations of Augustus dating from the 20s BC. Although there is at present no certainty that this site represents a wreck, the homogeneity of the material reported strongly suggests it.

Brentchaloff & Salviat, 1989.

**RIACE**

**985**

Map 1

Italy

38° 23' N. 16° 32' E. Near Riace Marina (Calabria); the remains of the supposed wreck lay under sand among rocky outcrops, 150 m from shore. Depth: 6 m.

Works of art.

1st century AD ?

Two male bronze statues were found in 1972 by S. Mariottini while snorkeling not far off the beach at Riace Marina. The subsequent conservation and exhibition of the statues caused both public and scholarly interest. The statues are both of 5th-century BC type, but not of exactly identical style; it has been argued by some scholars that they are in fact Hellenistic or Roman, but the general weight of technical details is against this. Tenons of lead in the statues' feet show that they had been removed in antiquity from their bases, and thus were probably spolia lost in transit from Greece to Rome.

Successive investigations of the site (by N. Lamboglia, F. Pallarés and A. Freschi) produced a small further statue fragment (a shield-grip), 28 lead rings (certainly nautical equipment, perhaps the brailing-rings from a sail), the lead lid of a jar (probably Roman: cf. **Sécanion**), a fragment of a Roman ship's keel, an iron grapnel anchor (probably not ancient) and some amphora fragments. This is not conclusive evidence for an actual shipwreck at the spot, but, especially in view of the fact that there are dangerous rocks close by, the supposition is certainly possible (as argued by Lamboglia and by Mocchegiani). Concreted to the statues were several amphora sherds; one of these was a Dr. 2-4 body sherd (cf. Type 6 of Panella & Fano (1977), probably Coan of the 1st century AD) and another which might be Rhodian. An amphora neck found at the site is of unidentified E. Mediterranean origin, and appears to have 2nd-4th century AD parallels. None of the sherds from the site is obviously of local manufacture, and most have at least the possibility of an Aegean origin; this must tend to strengthen the shipwreck interpretation. However, the date of loss of the statues remains unresolved, with consequent difficulties for their identification, since one cannot be sure whether or not they were still in position when Pausanias wrote his account of Greek monuments in the 2nd century AD. The statues probably represent heroes as victors in an armed race; when they were found, they were popularly associated with Saints Cosmas and Damian, patrons of Riace, whose arrival by sea is celebrated there annually. Their powerful visual effect, revealed by the conservators at Florence, provoked widespread interest in Italy and drew attention to the nation's underwater cultural heritage.

Vlad Borrelli & Pelagatti, 1984 (with various contributions and references); Mocchegiani, 1986: 170.

**RIOU A**

**986**

Map 5

France

43° 10' N. 5° 23' E. Wreck 'Riou 1', on the S. side of Riou island; 50 m off the island. Depth: 43 m.

Pottery. c. 200-190 BC.

An unusual cargo, consisting, apparently, only of black-gloss pottery, has been briefly reported. The pottery, which included plates and cups, was probably made in S. Etruria or Latium, and can be dated in the first years of the 2nd century BC.

Benoit, 1956: 29, no. 8; Lequément & Liou, 1975; Morel, 1981: 62 & F 1124a 4; DRASM, 1985: 49-50.

#### **Riou, site B**

No report has been published of a second site at Riou, implicit in the name 'Riou 3' (C).

**RIOU C** 987 Map 5 France

43° 10' N. 5° 22' E. Wreck 'Riou 3'; at the foot of a cliff on the NW. tip of Riou. Depth: 14-15 m.

Amphoras. c. 120-90 BC (?).

A cargo of Dr. 1A and Dr. 1C amphoras has been much looted. Some of the Dr. 1C amphoras (probably one-third of the cargo) are stamped **XAP** (retrograde). The Dr. 1A amphoras include some stamped **ΠΙ** and **D**; one has a stopper marked **LYKAITHOU**, as at **Maïre D**. There was also a cargo consignment of Camp. A plates. Shipboard finds included pottery, a lamp (used), a wooden awl and an iron engraving-tool. The ship, which can only have been of modest size, was badly destroyed by looting; the hull was lead-sheathed. A block and part of the pump tubing were found.

Carrazé, 1971b; 1975: 36; Charlin et al., 1978: 45; Amar & Liou, 1984: 157; Long & Ximénès, 1988.

**RISAN** 988 Map 1 Yugoslavia

42° 32' N. 18° 42' E. Near Risan, in the gulf of Kotor (Montenegro); depth not reported.

Amphoras. Date not reported.

An amphora wreck near Risan has been excavated by Kotor Maritime Museum, but no report has been published.

Information: N. Cambi (Lipari, 1976).

**ROCCA DI SAN NICOLA A** 989 Map 11 Italy

37° 6' N. 13° 52' E. W. of Licata (Sicily); close to the NW. side of San Nicola islet. Depth: 8-9 m.

No cargo. 15th century AD.

No structure or cargo survives from a late medieval ship, armed with bombards and cannon. Finds include lead shot and pottery (some of it decorated ware).

Freschi, 1986.

**ROCCA DI SAN NICOLA B & C** 990-991 Map 11 Italy

37° 6' N. 13° 52' E. A few metres to the W. and NW. of wreck A. Depth: 8-9 m.

No cargo. 4th-5th centuries AD.

Two groups of late Roman/Byzantine anchors, together with some fragments of 5th-century pottery, appear to be all that is left of two ships wrecked on the rocks of San Nicola islet. A detailed study of the site concluded that the groups of anchors were best explained in this way.

Freschi, 1986.

**ROCHE FOURAS, LA** 992 Map 5 France

43° 11' N. 6° 41' E. At La Roche Fouras islet (off Cap Camarat); 150 m SW. of the islet. Depth: 17 m.

Amphoras. c. 150-100 BC.

The wreck lay in a depression in the rocky bottom. The cargo was of a type of Dr. 1C amphoras; most were stamped (PAP, ST, SVR and D[ ]). Some retained their cork stopper, over which was a seal marked L.ASVI M.F round a motif. Part of the hull was excavated and studied in detail. The choice of wood used in its construction is unusual: the keel was of pine, while the frames were of oak or some other hardwood. There was no mast-step or keelson in the preserved area of the hull (but no suggestion that this was an extremity of the ship either). Floors (not fastened to the keel) alternated with half-frames, and both were joined to the planking by treenails alone; the treenails joining the first five planks on each side passed obliquely through the frames. The garboard strakes were deeply carved almost into a C-shaped section.

Carrazé, 1975: 34 & 43; Liou, 1975: 597-8; Joncheray, 1976c; Joncheray & Rochier, 1976.

**ROCHELONGUE** 993 Map 4 France

43° 15' N. 3° 28' E. 500 m off the point of Rochelongue (or Rochelongues), W. of Cap d'Agde; on a bottom of rocks and sea-grass. Depth: 6-8 m.

Copper ingots and bronze objects.

Mid 6th century BC.

A large bronze hoard, spread over an area 25 x 14 m, was excavated by A. Bouscaras (1964-71). Objects had worked their way down through the patches of sand (in places 1.2 m deep) to the rocky substrate; lighter objects were spread inshore relative to heavier, and many objects had been substantially eroded. However, the objects were found grouped by category, as if they had originally been packed in bags. There were at least 800 kg of copper ingots (the heaviest weighing over 11 kg); the 1,700 bronze objects (some new, some unused but with faults of manufacture, others broken) comprised mostly axes, harness fittings and decorative items, with a small number of weapons. Parallels can be found in NE. Spain, W. France, NE. France and NW. Italy. Although no traces of a ship were found, the hoard can only be explained as the wreck of a small vessel which conveyed an itinerant coppersmith.

Bouscaras, 1964b; 1964c: 5-14; 1965; 1966; 1968; 1972; Arnal et al., 1970; Bouscaras & Hugues, 1972; DRASM, 1985: 41-2.

**ROCHES D'AURELLE, LES**

**994**

Map 5

France

43° 27' N. 6° 56' E. Off Les Roches d'Aurelle (NE. of St Raphaël). Depth: 72 m.

Amphoras, pottery and tiles. c. AD 80-100.

A wreck, lying in deep sediment in very deep water, was partially excavated under A. Pollino in 1979. A concreted tumulus of amphoras, 8-9 m long, protruded 0.7 m from the bottom. There were some 60 pear-shaped Gaulish amphoras, of two types (Laubenheimer G5 and a squatter type dubbed G2); all were pitched internally, but may have been empty, as no stoppers were found. There were also approx. 1,000 coarse pottery vessels, comprising bowls, mortaria and jugs in orange-slipped Lorgues ware, jugs, jars, cups and dishes from Fréjus, and hand-made oxidized jars from an unlocated pottery in the same area. In the bottom of the ship was stacked a load of tegulae and imbrices, some 250 in all, of a fabric closely similar to the Frejus pottery. One tile was a chimney-tile. None of the cargo items showed signs of use; all must have been loaded at Fréjus. A Dr. 20 amphora was found on top of the wreck-mound; other shipboard items were a figured lamp, a fine-wall cup, and a Drag. 37 cup from La Graufesenque. The ship cannot have exceeded 12-15 m long. The great depth of the site (the deepest to be excavated using compressed air) has prevented complete examination of this interesting example of a Roman coaster.

DRASM, 1983: no. 83; 1985: 71 & 101-2, no. 438; Laubenheimer, 1985: 295-9; Berato et al., 1986; Pollino, 1987.

Roghi: see **Panarea**.

**Roquetas del Mar (Spain)**

A site N. of Roquetas del Mar (Almería) has produced a mixture of amphora types, though the remains of a wreck may be among them. There are several of form Dr. 14, a Dr. 38, and a globular (early Dr. 20 ?) amphora, as well as an (earlier) Dr. 1 and a post-Roman jar.

Pascual, 1973: 108-110; Beltrán, 1970: 458-9.

**ROQUETES, LES**                                      **995**                                      Map 4                                      Spain

41° 29' N. 2° 22' E. Between Vilasar de Mar and Premiá de Mar (Barcelona); detailed location and depth not reported.

A wreck, supposedly of 14th-16th century AD date, has been summarily reported from Les Roquetes.

Serra-Ràfols, 1961a.

**ROVINJ**    **996**                                      Map 8                                      Yugoslavia

45° 5' N. 13° 37' E. (approx.). At an unknown location, possibly near Rovinj; probably in deep water.

Amphoras.    c. 50 BC-AD 100 (?).

A wreck of amphoras similar to Dr. 6B lay in mud somewhere off the Dalmatian coast, and was reported briefly by a diver, together with a photo of one amphora. A similar amphora, with similar encrustations, now in Rovinj Museum, suggests that the wreck lay near there, though Vrsalović makes no mention of a wreck in this area. The amphoras are presumably of Istrian origin; no exact parallel, and thus no close date, is known to the writer.

Balenović, 1965; Vrsalović, 1974: fig. 113.

**RUNCORN**    **997**                                      Map 15                                      Britain

53° 20' N. 2° 44' W. A group of ingots, found in the R. Mersey in 1697.

Lead ingots.    c. AD 80-90 (?).

Twenty lead ingots, with marks of Vespasian, Titus and Domitian, are probably the remains of a sunken shipload, but nothing else can be said of the wreck.

Harmand, 1960: 417; Tylecote, 1962: 84-7; Roman Inscriptions of Britain 2403.33 & 36; Britannia 22 (1991): 319.

**SAGUNT**    **998**                                      Map 1                                      Spain

39° 40' N. 0° 12' W. Off the Grau Vell (the ancient port) of Sagunt (Saguntum); depth not reported.

Amphoras.    c. 25 BC-AD 75 (?).



A probable wreck of Dr. 7-11 amphoras was found in a survey off the Grau Vell in 1987. Nearby was an anchor stock, probably associated, inscribed **MAE LALI** retrograde (twice).

Aranegui, 1991; Bertó, 1991: 71-4.

Saint Cyr: see **Pointe Grenier**.

**SAINT GEORGE'S BAY**                      **999**                      Map 12                      Malta

35° 55' N. 14° 29' E. In St George's Bay, Malta. Depth: 18 m.

Pottery.                                      Date unknown.

A relatively coherent cargo of pottery lies, partly on rocks, partly on sand. The pottery, some of which was pitch-lined, has not yet been identified.

Unpublished.

**SAINT GERVAIS A**                      **1000**                      Map 4                      France

43° 25' N. 4° 56' E. 'Saint Gervais I', near Fos-sur-Mer; approx. 1 km SW. of Pointe Saint Gervais. Depth: 6-7 m.

Lead ingots and iron bars.              c. AD 140.

A wreck with a metal cargo was found near the ancient port of Fossae Mariana. The ship and cargo had been broken into two sections lying 30 m apart; some of the ship's hull survived in each section. The cargo included iron bars, which measured 55 x 3.1 x 2.7 cm; they were associated with lead ingots, one stamped with the name of Hadrian (AD 117-138), three others with that of Antoninus Pius (AD 138-161). Also found was a S. Gaulish terra sigillata plate of the 2nd century.

Monguilan, 1977; Liou, 1983; DRASM, 1983: no. 31; Jézégou, 1984: 6; Monguilan, 1987.

**SAINT GERVAIS B**                      **1001**                      Map 4                      France

43° 25' N. 4° 56' E. 'Saint Gervais II'; detailed location and depth not reported.

Wheat and pitch.                              c. AD 600-625.

The first ancient cargo of corn to be discovered was excavated in 1978-9 by M-P. Jézégou. Corn was found everywhere on the site; it was *Triticum* sp., mixed with *Agrostemma githago* L. (Corncockle), its parasite, and, though difficult to identify, could be *Triticum turgidum* L., Rivet wheat. This free-threshing wheat, better suited to biscuits than to bread, was widely grown in the ancient world. In the after part of the hull were re-used amphoras filled with pitch

(vegetable tar, derived from conifer resin). Pitch was a well-known product of SW. Gaul, and this part of the cargo had probably been collected there; the corn had come from further afield (Italy, Africa or Spain) and was shipped on from SW. Gaul towards Arles (not in a corn-growing area) via Fos.

Shipboard stores included some N. African t.s. chiara D, but also orange-painted and orange, lead-glazed pottery with E. Mediterranean parallels. Two grey-ware pitchers bore Greek graffiti, and one of the three shipboard amphoras was from Gaza. These eastern characteristics match historical evidence that, from the mid 5th century on, western commerce (at least in S. Gaul) was in the hands of Jewish and Syrian merchants. Probably also associated with the ship were two Merovingian brooches.

The ship was skeleton built, with almost no joints between the planks (of pine and fir), except at the ends of the ship, and even then irregularly spaced. There were traces of caulking between the planks (this was not known by Basch, 1986: 194). All the floors and some of the half-frames were fastened to the keel by long iron bolts; this skeletal structure was of elm. The planking was very thin (2 cm); there was no external sheathing. The planks did not fit the frames well: some were left extra thick, so as to meet the frames, and in places extra pieces of wood were added to take up gaps. The hull was assembled with both iron nails and oak treenails below the waterline, treenails alone above it. The evergreen oak wales, not integrated with the ship's side, were fixed to it and the futtocks with iron nails and boxwood treenails. The mast-step rested on stringers, themselves nailed to the floors, as were the fixed ceiling planks (of cypress). The ship had a deep, pointed cross-section, and a fairly fine bow, but a full stern; she was obviously capable of deep-sea navigation. The hull does not exactly resemble any other ancient ships; the closest parallel is the **Cavalière** ship, but that had a rather less full stern. On this basis, the beam of 6 m at the mainframe should imply (at a beam/length ratio of 2.5-3.0) a length of 15-18 m and a depth in the hold of 2 m; the calculated tonnage would thus have been 41-49 metric tons. Legal sources suggest a decline in the tonnage of ships during the 5th century, and the capacity of the Saint Gervais ship (6,000-8,000 modii) was much less than grain-supply ships of the Roman Empire (10,000-50,000 modii).

The ship's pump was well-preserved. Just aft of the pump were some broken stone slabs, probably the remains of a galley hearth. Other finds were a barrel, a wooden sail-ring, a bone marline-spike and an auger.

The construction of the Saint Gervais ship is more 'advanced' than the 'mixed' technique of **Yassi Ada A**, even though she is earlier. The new technique saved not only wood, but, more importantly, skilled labour.

Main account: Jézégou, 1983. See also: Jézégou, 1980; Tortorella, 1981: 369 & 375; Lequément, 1985: 111 & 117; Carre, 1983: 202; Rieth, 1983: 20; Foerster, 1984.

**SAINT GERVAIS C**

**1002**

Map 4

France

43° 25' N. 4° 56' E. 'Saint Gervais 3'; in Anse Saint Gervais, Fos-sur-Mer. Depth: 4 m.

Amphoras.

AD 149-154.

The ship sank in harbour, and, since only broken amphoras have been found, the unbroken amphoras will have been salvaged in antiquity. The main cargo was of Dr. 20 and Beltrán 2B amphoras from southern Spain; there were also pear-shaped amphoras from Gaul (Laubenheimer G4), stamped **QCA**. Most of the Dr. 20 oil amphoras are stamped, with stamps **L.S.A.R**, **Q.IAL** and **QIMPFN**; all preserve

painted inscriptions. Stamps and inscriptions together show that the olive-oil came from near Astigi (modern Écija) on the r. Genil, and can be dated between AD 149 and AD 154. Several estates, whose produce was bought and loaded aboard by several different merchants, are represented; the control-mark **R** (with a cross-bar) found on Dr. 20 amphoras imported to Rome is missing, suggesting that they were always intended for a destination in Gaul. After leaving Baetica, the ship must have put in at a port in Narbonensis and there taken aboard the Gallic wine amphoras before making a final call at Fos (Fossae Mariana), presumably en route for the lower Rhône. One of the Beltrán 2B amphoras bears the painted inscription **VIN(VM) R(VBRVM ?) AVR(ELIANVM ?) | VET(VS ?)**, and they may all have contained wine. The Gaulish amphoras no doubt also contained wine; one bears the painted label **PICATVM** (resinated wine).

Shipboard material included a basket which contained nine glass unguentaria, some still holding the remains of a cosmetic. The hull (excavated by J-M. Gassend, 1983-6) was preserved to an extent of 17 x 6 m; part of a concave stem, the steps for two masts, and a pump-well were among the features preserved. The heavy garboards, keel and keelson testify to a strongly-built ship, which was planked up to the seventh strake before the three key floors were bolted to the keel.

Brentchaloff & Lequément, 1978: 230; Liou, 1980; 1987a: 70 & 82; Lequément, 1985: 112 & 117; DRASM, 1983: nos 372-7; 1985: 64-5; Amar & Liou, 1984: nos 101, 154, 192 & 194; Carre & Jézégou, 1984: 129; Gassend et al., 1986: 24-5; Zevi, 1989: 7-8; Pomey et al., 1989: 12-13.

**SAINT GERVAIS D**                                 **1003**                                 Map 4                                 France

43° 25' N. 4° 56' E. 750 m W. of Saint Gervais. Depth: 6 m.

Amphoras.   c. AD 50-150 (?).

A scatter of broken amphoras was found in 1983; they are of forms Dr. 20 and Beltrán 2B. The ship's side was also preserved, with lead sheathing.

Pomey et al., 1989: 13.

**SAINT HONORAT**                                 **1004**                                 Map 5                                 France

43° 30' N. 7° 3' E. On the W. edge of the 'Tourelle des Moines' reef, S. of Saint Honorat (Îles Lerins). One amphora lay on top of the reef, the rest at 18-20 m deep.

Amphoras.   c. AD 160-200.

The cargo of the 'Tourelle des Moines' wreck was composed entirely of Dr. 20 amphoras. There were three varieties; the first bore the stamps **LIT** and **LI.YT**, the second **.A** (in relief, without a frame), **[L]AEP**, **AC.N** and **[ ]ON.V[ ]**. The third variety, represented by a single amphora, was unstamped. Unfortunately much of the cargo and an anchor-stock were looted. No remains of the ship were found. The amphora-stamps can all be placed in the period from AD 160 to AD 200.

Pollino, 1976; 1983: 45-7 & pls 31-3.

**SAINT HOSPICE****1005**

Map 5

France

43° 41' N. 7° 21' E. Reported as lying 100 m off Pointe Sainte Hospice (E. of Nice). Depth: 40 m.

No details have been reported of a wreck (Roman ?) said to have been found off Pointe Sainte Hospice.

Benoit, 1960: 54; Fonquerle, 1972: 56.

**SAINT PAUL'S BAY****1006**

Map 12

Malta

35° 58' N. 14° 24' E. (approx.). In St Paul's Bay, Malta; partly overlain by boulders. Depth: 15 m.

Amphoras.

6th-2nd centuries BC (?).

A heap of broken amphoras, not thoroughly surveyed, may represent a wreck. The amphoras appear to be of Punic form, but have not been more closely identified.

Unpublished.

Information: J. Langford.

**SAINT PETER PORT****1007**

Map 15

Channel Islands

49° 27' N. 2° 32' W. In the mouth of Saint Peter Port harbour, Guernsey. Depth at low water: 8 m.

No cargo (?).

c. AD 280-290.

A Roman ship, damaged by modern ferry-boats, was discovered by R. Keen in 1982 and excavated by M.H. Rule in 1984-5. Pottery of the 1st-2nd centuries AD was found in the vicinity, but the wreck is firmly dated by finds from within the hull, especially 43 coins, including radiates. The bottom of the ship was covered with pitch (melted in a fire and then solidified), which preserved a good deal of wheat (the last cargo ?), complete with tailings, as harvested. There were also some roof-tiles, pottery, etc. The hull was of very thick oak planks, fastened to frames by iron nails. There was no keel, but, instead, a composite keel-plank, 1 m wide at the maximum, 10 cm thick. Items of the ship's equipment included some sail cringles, and five pulleys (probably all part of the pump). The ship, estimated to have been some 25 m long, may in general terms be compared with **London (Blackfriars)**, and both ships may have been built in the lower Rhine region. The timbers of the Saint Peter Port ship have been raised and are being conserved for eventual display.

Keen, 1986.

Information: M. Dean; R. Keen; P.R.V. Marsden; M.H. Rule.

Saint Raphael: see **Dramont**, etc.

**SAINT TROPEZ A****1008**

Map 5

France

43° 16' N. 6° 38' E. From the harbour of Saint Tropez. Depth: 6 m.

Marble.

2nd century AD ?

Twelve large pieces of white Luna marble (column drums, bases, a slab and an architrave) were lifted in 1951. Their weight was estimated at 200-230 tonnes, and a further large drum was not recovered. No nails or other remains of a ship were found, though the stone was raised in an emergency operation, not an excavation. The size of the columns has suggested, since the time of their salvage, that they were intended for the rebuilding of the Capitolium of Narbonne (restored in 149, after being destroyed by fire, by the shipper Sex. Fadius Secundus Musa), but this is only surmise.

Benoit, 1952b: 244; 1956: 1; Diolé, 1954: chap. 6; Perret, 1956; Gianfrotta, 1981a.

**SAINT TROPEZ B****1009**

Map 5

France

43° 16' N. 6° 40' E. In the bay of Saint Tropez; 250 m SW. of Rabiou beacon. Depth: 30 m.

Amphoras.

c. 25 BC-AD 75 ?

A wreck of Dr. 2-4 amphoras, with at least one ovoid amphora as well, has been briefly reported.

Benoit, 1960: 45 & fig. 14; Carrazé, 1970f: 42.

**Saint Tropez: other sites**

An amphora wreck (of unstated kind) is said to have been found at 110 m deep by coral divers in 1970 (Joncheray, 1972c: 12).

A site at La Moutte is too vaguely reported to be defined as a wreck (Benoit, 1958: 28; 1960: 45).

See also **Cap Camarat**.

**SAINTE MARGUERITE****1010**

Map 5

France

43° 1' N. 7° 1' E. At the W. end of Île Sainte Marguerite, near Cannes; on a muddy bottom. Depth: 50 m. (The site is named Sainte Marguerite B by Pollino (1983), but no wreck A has been reported).

Amphoras.

c. 100-50 BC (?).

The site, as discovered in 1974, had been almost completely destroyed by a big ship's anchor or the like which had been dragged across it. A trench, 25 x 5 x 0.6 m, showed it had been a large, well-preserved wreck. Some Dr. 1B amphoras and a Dr. 1A (?) neck were recovered; one amphora bottom is stamped (with a letter (?) and a palm (?) branch). In the trench, remains of the ship

were visible, including planking, frames, stringers, ceiling, and lead sheathing.

Pollino, 1983: 41-2 & pl. 24; cf. Joncheray, 1976d: pl. IV. 43.

**SAINTE MARIES-DE-LA-MER A, LES 1011** Map 4 France

43° 27' N. 4° 25' E. On the beach W. of Les Saintes Maries-de-la-Mer; the ship sank in an old branch of the Rhône, now represented by the Etang des Launes.

Amphoras. c. 100-25 BC (?).

A number of amphoras on the modern beach represent a cargo lost at an ancient mouth of the Rhône. Some seals were preserved; they read **L.POMPON ML** and **CN [ ]POMP**. A published drawing shows an amphora of uncertain type, perhaps Dr. 1B.

Gallia, 6 (1948): 213; 11 (1953): 110.

See also **Grand Radeau**, approx. 4 km to the west.

**SAINTE MARIES-DE-LA-MER B, LES 1012** Map 4 France

43° 25' N. 4° 25' E. (approx.). Off Les Saintes Maries-de-la-Mer. Depth: 10-15 m.

Works of art (and possibly other cargo).  
1st century BC (?).

A bronze satyr, 0.51 m high, was brought up in a trawl in 1967. The same trawling run also produced some amphoras (of unknown form) and 'stones' - possibly column-drums; it is not clear why recent publications have discounted these as constituting a wreck.

Valaison, 1970; Tchernia, 1969: 492; DRASM, 1983: no. 157; 1985: 73.

**SAINTE MARIES-DE-LA-MER C, LES 1013** Map 4 France

43° 25' N. 4° 24' E. Four miles off Les Saintes-Maries-de-la-Mer. Depth: approx. 18 m.

Copper ingots. 2nd century AD ?

An ancient shipwreck was fouled by a trawl following a storm; the fisherman, with the help of a diver, recovered two copper ingots from the site. The ingots were both flan-shaped, with a central mark **V** applied to the hot ingot, and weighed 88 kg; unusually for Roman copper ingots, the inscription incised cold on the edge of the larger flat face includes a numeral (**CCLXIX**) which represents the weight of the ingot in Roman pounds. Personal names and other letters can also be read at the edge; there appears to be no incised inscription in the main field of the ingot (as, for instance, at **Planier B**), but these

ingots are perhaps of similar date to those. No other finds are reported from the site.

Maréchal, 1986; 1987b.

**SALAKTA** 1014 Map 1 Tunisia

35° 20' N. 11° 4' E. Off Salakta (ancient Sullectum), S. of Mahdia. Depth: 4-5 m.

Marble blocks. Early 3rd century AD (?).

Visiting divers discovered a wreck lying in sand which contained carved marble blocks. These included parts of an architrave and a pilaster which appear to be of the Severan period, in white marble with grey markings; there were also some plain slabs or blocks. The marble lay on the frames and planking of a ship; no small-finds are reported, and it is possible that the wreck is not in fact ancient. The remains are still in situ.

Unpublished.

Information: L. Nowicz.

**SALERNO** 1015 Map 9 Italy

40° 39' N. 14° 46' E. (approx.). To the S. of Salerno; exact location not stated.

Stone blocks. Date unknown.

A cargo of blocks of grey limestone has been briefly reported, without further information.

Gianfrotta & Pomey, 1981: 222.

**SALIAGOS** 1016 Map 13 Greece

37° 2' N. 25° 6' E. (approx.). On the E. side of Saliagos, between Paros and Antiparos. Depth: 2-3 m.

No cargo (?). Roman period.

A small pile of ballast stones, together with Roman coarse pottery, was seen in shallow water at Saliagos in the 1960s.

Unpublished.

**SALINES, SES** 1017 Map 3 Spain

39° 18' N. 3° 0' E. Near Colònia de Sant Jordi (Majorca); precise location and depth unknown. The site has also been referred to as 'Colònia de Sant Jordi B', and probably lay in shallow water, not far S. of **Colònia de Sant Jordi A** (Cerdá, 1980). It has been claimed (by Guerrero & Colls) that the site is fictitious, and that the material published as from 'Ses Salines' in fact came from **Cabrera E**; however, neither the amphoras nor the ingots found at Cabrera E are exactly paralleled by the 'Ses Salines' material. That a search by Guerrero & Colls of Colònia de Sant Jordi bay failed to locate the site is hardly surprising, since the wreck was already known (and looted) prior to 1961, and in 1980 was described (by Cerdá) as completely stripped by looters.

Amphoras and lead ingots. c. AD 70-80.

The main cargo of this wreck comprised a large number of south Spanish amphoras, some of Dr. 7-11 form, the rest Dr. 20. Apparently none bore stamps or retained any contents; some traces of painted inscriptions were visible, but could not be read. There were also originally about 50 lead ingots, of truncated pyramid form; five different names appear in the mould-marks on the upper surface of the surviving ingots, and there are counter-stamps, **IMP.CAES** or **VESP.AVG**, on one side. The counter-stamps refer to the reign of Vespasian, as is confirmed by an ingot, with mould-mark (like some from this wreck) **P.AEMILI GALLICI**, counter-stamped **NER AVG**, **N FLAE IVL** and **ACARSP** and with incised numeral **VIIII**, from Pompeii (Domergue, 1984: 210). The Ses Salines ingots, too, were marked with an abbreviated indication of their weight.

No shipboard pottery or other finds have been reported, apart from an iron helmet (apparently of legionary type), an iron sword-blade, and an iron bar with a ring at one end and three hooks at the other (possibly a steelyard?). There were also two iron rings or hoops, and an iron anchor. Some bronze vessels were said to have been found, but nothing is known of these. The hull is represented by some lead-sheathed wood and bronze nails, together with an object of bronze and iron which is perhaps a keel-bolt.

The importance and interest of this wreck, especially the lead ingots, make its loss particularly sad.

Veny, 1969-70 (superseding earlier accounts); Parker, 1974b; Cerdá, 1980: 12-13; Guerrero & Colls, 1982: 6-8.

Salis, Anse de la (Antibes): see **Pointe Bacon**.

**SALOU** 1018 Map 4 Spain

41° 2' N. 1° 10' E. (approx.). Off Cape Salou (Catalonia); detailed location and depth unknown.

Amphoras. Mid 1st-end of 2nd century AD (?).

Three Dr. 20 amphoras, lacking their rims, were brought up by a fisherman in 1935, and doubtless derive from a shipwreck. The body profile published suggests a date neither early nor late in the development of the form.

A wreck off Salou is said by Beltrán to have been discovered 'recently' and to contain both Dr. 20 and fish-sauce amphoras; this is perhaps a reference to the same find.

Vilaseca, 1954; 1958: 237; Beltrán, 1970: 488.



**SAN BARTOLOMEO**

1019

Map 7

Italy

43° 53' N. 8° 5' E. (approx.). At San Bartolomeo al Mare (Imperia); detailed location and depth not reported.

Cargo not reported.

1st century BC.

A short reference to a mission undertaken by Carabinieri divers in 1982 says that very interesting items belonging to the equipment of an 'important' 1st century BC shipwreck were recovered.

Griva, 1983: 63.

See also **Diano Marina**.

**San Felú de Guixols (Spain)**

This name is mentioned in a list of Etruscan wrecks by Benoit (1965a: 56). It is possibly a reference to **Punta Salina**. For shipwreck material in San Felú de Guixols Museum, see **Margarida** and **Punta Prima**.

**SAN FERREOL**

1020

Map 2

Spain

37° 48' N. 0° 44' W. Named for the day it was located; the wreck lies close to the beach of La Manga del Mar Menor, scattered on the inshore side of a reef. Depth: 4-5 m.

Amphoras, pottery and colorants. c. 110-80 BC (?).

Excavation by J. Más revealed a cargo of Dr. 1B amphoras and Camp. B pottery, lying protected by weed growth in gullies up to 2 m deep. The amphoras, of at least three varieties, generally resemble those of the **Madrague de Giens** wreck, but are mostly unstamped; one stamp has been published, but it is not easily legible. The amphoras were stopped with corks and seals; the seals have epigraphic marks. In some cases the marks comprise several small stamps applied successively to the seal, which appear to read **SIC** (repeated), **EI** (repeated) and **Q EI CC O S**; some may be anepigraphic. There is also at least one seal, too worn to read, stamped twice with a semi-circular stamp (Más, 1985b, fig. 19). The Campanian ware is mostly of two forms (Lamboglia 1 and 7), though quite a range was found; comparisons suggest a date early in the 1st century BC, cf. **Grand Congloué B**. A large number of blue-grey balls, at first sight like gaming pieces, included a percentage of copper in their makeup and were probably pigment (cf. **Planier C**).

Shipboard material included a selection of Greek and Roman amphoras, comprising Chian, Rhodian, Dr. 2-4 (apparently with a Greek stamp), Lam. 2 and ovoid forms. There was some grey tableware, fine-wall cups and a range of cooking and storage pottery, some lamps and fusiform unguentaria and a mosaic-glass plate. Personal items comprised a surgeon's instrument case of wood and bone (but without instruments), a stone palette, a decorated bone comb, a strigil, a needle-case and a bone pin. Only fragments of the hull survived; it was lead-sheathed.

Blánquez, 1982: 59-60; Más, 1985b.

**SAN NICOLA****1021**

Map 11

Italy

37° 56' N. 12° 20' E. At San Nicola, on the N. side of Favignana (Egadi Islands); at the edge of sand and sea-grass. Depth: 14 m.

Amphoras.

Early Imperial period.

A variety of amphoras has been reported from San Nicola; the majority are of the early Roman Empire (including Dr. 20 and Dr. 28), and these probably represent the remains of a wreck of this period.

Purpura, 1986: 150, no. 70.

San Nicola (Sicily): see **Rocca di San Nicola**.

San Pedro del Pinatar: see **Los Escullis, Punta de Algas, and San Ferreol**.

**SAN PIETRO****1022**

Map 10

Italy

40° 18' N. 17° 40' E. At San Pietro in Bevagna, SE. of Taranto; 110 m from the beach. Depth: 3-6 m.

Marble sarcophagi.

AD 200-250 (?).

A total of 23 sarcophagi were found at the site. Some had been left double by the Roman workmen; some had a lid (to fit a different sarcophagus) still attached. The marble, a fine, crystalline white stone, may have come from Aphrodisias in Asia Minor. Some of the sarcophagi are of the type with round ends and projecting bosses common in the 3rd century.

Other finds included tile and amphora fragments (datable to the first half of the 3rd century), 'late Roman pottery', a lead ring, and a sheet of lead. Parts of two elm frames were also found, with square holes where iron nails had been.

Ward-Perkins & Throckmorton, 1965.

**SAN VINCENZO A****1023**

Map 7

Italy

43° 5' N. 10° 32' E. At San Vincenzo, N. of Populonia bay (Etruria); the site lies 50 m from the shore. Depth: shallow.

Iron objects and slag.

c. AD 1300 (?).

A survey in 1978 revealed a cargo of slag and iron concretions. No pottery was found, and the dating evidence is not stated.

Romualdi, A., in Martelli *et al.*, 1982: 55.

**SAN VINCENZO B**

1024

Map 7

Italy

43° 3' N. 10° 31' E. (approx.). Between Baratti and San Vincenzo; detailed location not reported. Depth: shallow.

Amphoras. 3rd century BC-1st century AD (?).

The remains of a ship with amphoras of unstated type, pottery, a pair of mill-stones and a lead anchor-stock have been briefly reported. This might be a confusion with other wrecks in the same area (cf. Il **Pozzino**).

Gandolfi, 1985b: 677.

**SAN VITO**

1025

Map 11

Italy

38° 10' N. 12° 46' E. At Tonnara del Secco, E. of San Vito (W. Sicily); exact location and depth unknown.

Amphoras. Graeco-Roman period.

Fragments of amphoras, etc., may belong to a wreck off Tonnara del Secco, reported by fishermen but not yet located.

Purpura, 1986: 147, no. 52.

**SANCAK BURUN**

1026

Map 13

Turkey

37° 0' N. 27° 57' E. At Sancak (or Sanjak) point, on the N. coast of Kerme Gulf; on a sandy slope. Depth: 36 m.

Amphoras. Late 1st century BC-1st century AD.

The cargo consists of a heavily concreted deposit of early Imperial Rhodian amphoras. Hull timbers are also present.

Bass, 1974, site 1; 1975, site G (no. 18).

**SANCTI PETRI**

1027

Map 2

Spain

36° 24' N. 6° 13' W. 'El Pecio del Cobre', on the W. side of Sancti Petri island, near Cadiz; on a rock and sand bottom. Depth: 6-9 m.

Lead and copper ingots. Mid-late 1st century AD.

A load of lead and copper ingots has been partly excavated by O. Vallespín; the cargo, of total weight some 2 tonnes, and spread over an area 27 x 20 m, was all that could be found at the site. Eighteen lead ingots, of prismatic shape, weighing on average 60 kg, have been raised; they have a single, long cartouche on their upper surface, but no inscription, except for the numeral **XVII** on one. Their shape and size suggest a comparison with **Lavezzi A** (mid-late 1st century AD). The 28 copper ingots raised bore no inscription; their weight varied from

13 kg to 84 kg. They are of two types, bun-shaped (cast in a mould) and cake-shaped (cast in the furnace). A small lead anchor-stock was found 100 m away.

Blánquez, 1982: 68-70, 74, 76-7; Vallespín, 1986.

**SANGUINET** 1028 Map 15 France

44° 26' N. 1° 5' W. Near the submerged Gallo-Roman settlement of Losa, in the Étang de Sanguinet (Landes). Depth: 4-6 m.

No cargo. Mid 2nd century AD (?).

Close to the underwater excavations of a Roman settlement was found an oak dugout, 3.73 m long, with shaped ends and upstanding reinforcements in the bottom. The boat is thought to date from the middle of the 2nd century AD.

Coupry, 1979; Meynard, 1982.

Sanjak: see **Sancak Burun**.

**SANT ANTONI** 1029 Map 3 Spain

38° 59' N. 1° 15' E. (?). Off Sant Antoni (San Antonio Abad, Ibiza); detailed location and depth not reported.

Amphoras. c. AD 1-50 (?).

A cargo of Dr. 9 amphoras, thought to be late Republican or early Imperial, has been briefly reported. No details have been published; the site is said to be 'in the area of Sant Antoni, opposite Conillera'.

A Dr. 9 amphora is on view in a local hotel, together with other material from underwater sites in the vicinity (writer's observation).

Blánquez, 1982: 36.

See also **Conillera** and **Cap Negret** (neither site is referred to by Blánquez, *cit.*). Material seen by the writer at Sant Antoni includes a pair of encrusted amphoras, form Dr. 1C derivative (cf. **Grand Congloué C**), which very likely came from a wreck, though no corroborative information is available.

Sant'Andrea: see **Capo Sant'Andrea**.

**SANT'ANTIOCO A** 1030 Map 6 Italy

38° 57' N. 8° 25' E. (?). At Sant'Antioco (Sardinia); detailed location and depth not reported.

Amphoras and pottery. AD 275-300.

A cargo of 'Africana grande' amphoras and 't.s. chiara D' pottery has been only briefly reported by Gianfrotta & Pomey.

A reference to the fineware cargo of **Fontanamare A**, not far away, as of 'unspecified type' raises the possibility that there has been some confusion of site.

Gianfrotta & Pomey, 1981: 166 & 179.

See also **Sulcis**.

**SANT'ANTIOCO B** 1031 Map 6 Italy

38° 57' N. 8° 25' E. (?). Location and depth not reported.

Building stone. Roman period (?).

A 'transport ship', with a cargo of stone blocks, has been summarily reported.

Zara, 1984.

**SANTA CATERINA DI NARDO** 1032 Map 10 Italy

40° 8' N. 17° 59' E. At 'Punta dell'Aspide', near Santa Caterina di Nardò; 300 m from the coast. Depth: 22-24 m.

Amphoras. Mid 2nd century BC.

A survey by 'Aquarius' in 1982 revealed a heap of amphoras, 15 x 5 m in extent, belonging to a local type of the Graeco-Italic form. The central area had been looted. At the E. end, excavation exposed the keel and part of the lead-sheathed hull planking, establishing that this was the stern. A metal-detector survey found a strong reaction at the W. end, indicating that there were anchors still on board at the bow. Two layers of amphoras were found; they were of two varieties, closed with a terracotta stopper sealed over with pitch and mortar. Also found were many black-gloss plates, two white-painted vases and some coarse pottery, establishing a definite date for the wreck.

Laviano, 1983; Cortese, 1986; De Juliis, 1986; Freschi, 1988.

**SANTA CESAREA** 1033 Map 10 Italy

40° 2' N. 18° 28' E. Said to be at Santa Cesarea Terme (Lecce); exact location not reported.

Cargo not reported. Date not reported.

While surveying **Porto Badisco** in 1972, the CSAS team carried out further exploration in the same area, 'identifying a second wreck at Santa Cesarea Terme'.

Lamboglia, 1972b: 450.

**SANTA MARIA****1034**

Map 6

Italy

41° 17' N. 9° 23' E. At Santa Maria island, NE. Sardinia; under the lighthouse at the E. point, Punta Filetto. Depth not reported.

Amphoras. 3rd century AD (?).

A shipload of amphoras was seen here by R. Ferrandi and G. Roghi in 1959-60. From a sketch and a description of the amphoras, it seems likely that they are of Afr. 2A form, datable presumably to the 3rd century.

Unpublished.

Information: R. Ferrandi (courtesy of G. Kapitän).

**Santa Maria: another site**

Several marble blocks found in the sea near Punta Filetto are doubtless from a wreck, but it could be of any date.

Boninu, 1986: 59.

**Santa Marinella (Italy)**

Off the point of Santa Marinella, between Santa Severa and Civitavecchia (Tuscany), material raised from possible wreck sites includes fragments of dolia, one bearing the stamp **M.CALICIVS | DIOPHANT.F.**

Gianfrotta, 1982; Gianfrotta & Hesnard, 1987: 289.

**SANTA SEVERA****1035**

Map 7

Italy

42° 0' N. 11° 57' E. Off Santa Severa (not far from ancient Pyrgi); on a sandy bottom, 200 m from the coast. Depth: 3-5 m.

Amphoras. 50-25 BC (?).

Despite looting, much information about the heavily-concreted wreck has been collected by P.A. Gianfrotta. The main cargo was of Dr. 1B amphoras, thickly pitched internally, stamped **DAM, EVTA, HERM, OPEL, PILIP** and **L.LENTIV.P.F.** All these stamps, except the last, have been found on the closely similar amphoras of the contemporary **Dramont A** wreck; they are widely distributed in land finds, which must reflect a keen demand for the wine they will normally have contained. This may have been Falernian, from the Minturnae area of Campania. Other amphoras from the site include an Apulian amphora and a bifid handle from a Dr. 2-4 amphora. The main cargo was, however, of Dr. 1B amphoras. It appears that one Dr. 1B amphora, when found, contained olive-pits. Remains of the ship and her equipment include copper nails and tacks, a wooden pulley and a large lead ring.

The 'L. Lentulus P. f.' named on some of the amphora-stamps may be L. Cornelius Lentulus Crus, consul 49 BC, whose properties in Campania doubtless produced wine. This may be the same Lentulus whose ships transported to Italy







43° 19' N. 5° 4' E. (approx.). 'Sausset 1', between Cap Couronne and Aragon island (W. of Sausset-les-Pins). Depth: 33 m.

Amphoras. 6th century BC.

A much looted wreck of Massiliot amphoras was found in 1981. Part of an Etruscan amphora was also found. The hull was partly preserved, but has not been studied in detail; at one point, some lead appears to have been run into a chink as a repair.

Pomey *et al.*, 1989: 25-6.

**SAVELLETRI**

**1043**

Map 10

Italy

40° 52' N. 17° 24' E. To the N. side of the small harbour of Savelletri or San Velletri (near Fasano); on the landward side of a reef which lies 80-110 m offshore. Depth: 4-5 m.

Amphoras. 280-250 BC.

The fragmentary amphoras lay in sand-filled pockets of the rocky bottom, 50-80 m from shore. The reef beyond, which must have been the final cause of wreck, rises to 2 m below the surface. The cargo comprised Corinthian amphoras of types A and B; also on board were a Greek amphora of undefined type and two amphoras (one probably Graeco-Italic) with triangular-section rim. A dolium rim, some household ware and a terracotta disc were also found; so, too, was a lead horn, though in view of the scattered nature of the site its association with the wreck is not certain. This is the latest known Corinthian shipwreck, datable by the form of the amphoras to the period after the fall of Gela, and perhaps as late as the middle of the 3rd century BC.

Kapitän, 1972a; 1973a; Koehler, 1978: 237; 1979: 21, 40, etc.

Information: C.G. Koehler.

**SAVUDRIJA**

**1044**

Map 8

Croatia

45° 29' N. 13° 30' E. Near Savudrija point (Istria). Depth: 22 m.

Amphoras. c. 140 BC-AD 20 (?).

An excavation which raised 700 items has been only briefly reported. No illustrations or other details are provided; the published date is apparently derived from the form of the amphoras, said to be of 'Graeco-Italian' type, and is variously stated by Vrsalović.

Vrsalović, 1974: 21, 53, 238 & 240.

**ŠĆEDRO A**

**1045**

Map 8

Croatia

43° 5' N. 16° 40' E. Near Šćedro, on the S. side of Hvar island. Depth not reported.

Amphoras. 4th century AD (?).

Only a brief report of this site has been published; the exact date and the form of the amphoras are not stated.

Vrsalović, 1974: 240, no. 11.

**ŠĆEDRO B** 1046 Map 8 Croatia

43° 5' N. 16° 40' E. (approx.). Off Šćedro; detailed location and depth not reported.

Amphoras. c. 75-25 BC (?).

A wreck of Lam. 2 amphoras can be seen in an underwater photo, illustrating an article which gives a vague account of several sites round Šćedro. Another photo shows a lead anchor-stock.

Popovic, 1978.

**SCIACCA** 1047 Map 11 Italy

37° 29' E. 13° 5' E. (approx.). At 'C. da Foggia' (not found), 1 km from the coast near Sciacca (Sicily); depth not reported.

Cargo not reported. Roman period.

A Roman wreck, preserved under mud, has still to be investigated.

Panvini, 1991: 197.

**SCIALANDRO A & B** 1048-1049 Map 11 Italy

38° 6' N. 12° 41' E. At Scoglio Scialandro (or Giolandio), near Punta Barone (W. Sicily). Exact location and depth unknown.

A. Amphoras. Mid-late 2nd century BC (?).

B. Amphoras. 1st-3rd centuries AD (?).

Finds of amphoras from Scialandro rock (some from considerable depth, it seems) probably represent two wrecks. One is Roman, with what seems to be a variety of Dr. 1A amphoras; the other, said to be Byzantine by Purpura, but probably of the Roman Empire period has squat, ring-footed amphoras of form Panella 44-47 (cf. **Punta Raisi**).

Purpura, 1986: 147, no. 55.

**SCOGLIETTO** 1050 Map 7 Italy

42° 49' N. 10° 19' E. Off the N. coast of Elba, near Portoferraio. Depth: approx. 72 m.

Amphoras. Date unknown.

Not much is known of a 'field of amphoras', apparently much looted, in very deep water at Scoglietto.

Pallarés, 1983b: 181, no. 7 (citing G. Brambilla).

**SCOGLIO BUSINCO** 1051 Map 6 Italy

40° 50' N. 8° 11' E. (approx.). In the sea off Scoglio Businco, between Capo Mannu and Isola dei Porri in NW. Sardinia; exact location and depth not reported.

Lead ingots. Mid-late 1st century BC (?).

In 1966-7 seven lead ingots with rounded backs were raised from this site. Five are unmarked; two have one mould-mark (illegible) and, on a long side, the counterstamp **CERDO**. Apparently part of the ship's hull survives. The site has sometimes been confused with **Punta Falcone**, q.v.

Contu, 1967; Lo Schiavo & Boninu, 1985: 141; Boninu, 1986: 55.

**SCOGLIO DELLA FORMICA A** 1052 Map 11 Italy

38° 5' N. 13° 33' E. Near Solunto (Porticello, Sicily); on a sandy bottom. Depth: 53 m.

Amphoras. 2nd century BC.

A wreck with Punic amphoras is known mainly from material acquired from divers. The amphoras are of three kinds, Mañá C2 and two varieties of an unclassified, rimless form. Some crumpled bronze sheathing is also said to have come from the site.

As well as the Punic amphoras, two Roman amphoras, form Dr. 21/22, have been published (by Tusa) as perhaps coming from this site; this seems impossible chronologically, and is not supported by Purpura in his catalogue.

Tusa, 1961: 73-4; 1971: 265-7; Purpura, 1986: 143.

Information: G. Kapitän.

**SCOGLIO DELLA FORMICA B** 1053 Map 11 Italy

38° 5' N. 13° 33' E. On the N. side of La Formica. Depth: 57 m.

Pottery, lamps and iron objects (?).  
9th-11th centuries AD.

A Saracen wreck has been reported from Scoglio della Formica. Finds include filter jugs, lamps and iron objects; whether these were cargo is not certain. There are said to be remains of the hull.

Purpura, 1986: 143.

Scoglio Scialandro: see **Scialandro**.

**SCOGLITTI** 1054 Map 11 Italy

36° 52' N. 14° 25' E. (approx.). Off Scoglitti (S. Sicily); exact location and depth not reported.

Cargo not reported. Roman period.

The 'wreck of a Roman ship' was found by a survey ship in 1984; only a summary report has been published. Byzantine and medieval finds are mentioned in the same report.

Gandolfi, 1985b: 674-5.

**SCOLE A, LE** 1055 Map 7 Italy

42° 21' N. 10° 55' E. At the foot of a reef, S. of Giglio Porto (Tuscan Islands). Depth: 45-52 m.

Amphoras. c. AD 365-380.

A perfectly-preserved cargo of cylindrical amphoras was discovered in 1961, and soon stripped. Only brief accounts have been published, but information from divers indicates that the ship's hull is still in situ, and that a hoard of coins (both silver and bronze, and numbering approx. 500 coins) was found in some kind of box. The amphoras had cork stoppers, and extended over an area as much as 33 m long, according to some reports. The note by Rendini appears to imply that amphoras of more than one form, and both lead-stocked and iron anchors, were found, but this has not been confirmed by other sources. No pottery or other small-finds are reported; the coins apparently close with Valens (AD 364-378).

Olschki, 1961; Sarra, 1962; McKee, 1968: 106-9; Vallintine, 1970; Rendini, P. in Martelli et al., 1982: 50-1.

**SCOLE B, LE** 1056 Map 7 Italy

42° 21' N. 10° 55' E. Between Le Scole and the main island of Giglio. Depth not reported.

Amphoras (?). Date unknown.

A very badly-broken up wreck close to shore has not been studied.

Unpublished.

Information: R. Vallintine.

**SCOPELLO** 1057 Map 11 Italy

38° 4' N. 12° 49' E. At Guidaloco, Scopello (W. Sicily). Depth: 35 m.

Amphoras. Republican period.

A wreck with 'Italic' amphoras and lead rings has been summarily reported.  
Purpura, 1986: 157.

#### **Scopello: other finds**

Punic pottery and amphoras of the 3rd-2nd centuries BC, recently reported from Scoglia Fungia, Scopello, are not stated to be a shipwreck.

Purpura, 1986: 157.

**SEC, EL** 1058 Map 3 Spain

39° 28' N. 2° 31' E. Near the islet of El Sec, in the mouth of Palma bay (Majorca); on a sandy bottom. Depth: 31-33 m.

Amphoras, bronze utensils, ingots, pithoi, pottery and grinding-stones.  
360-340 BC.

A classical Greek wreck in Palma bay, already much looted, was partly excavated by F. Pallarés together with C. Enseñat in 1970; a full report on the excavated material has been published by Arribas *et al.* (1987). The site was originally marked by an enormous concretion, 12 x 9 m in extent and 3 m high, which had formed around a consignment of bronze (and also perhaps copper) kettles or cooking-pots; unfortunately, an attempt (by the Navy) to free the concretion with explosives resulted in the destruction of nearly all the bronzes. The rest of the cargo extended to the edges of an area 40 x 30 m, under a sealing layer of coarse sand and gravel. To the S. of the bronzes lay rectangular lever-mill stones and pottery; to the W., large amphoras; to the E., smaller amphoras; in the centre and to the N., bowls and metal fragments. The N. part had been most badly robbed, and in places only the ship's timbers remained. The timbers showed that the ship lay N.-S., but the bow and stern have not been identified. Some timbers were burnt; fire may have been the cause of wreck. Although the circumstances of recovery of information about the site were certainly less than ideal, the view that there is more than one wreck present, or that there was serious contamination (as argued by more than one contributor to Rouillard & Villanueva-Puig, 1989), seems unsupportable (and is well refuted by Cerdá, *ibidem*).

The bronze vessels comprised a large number of small kettles with twin handles and bellied buckets with a single plain handle; there were also an unknown quantity of other items, such as a column-krater with decorated handles and foot, a pitcher, a box, a candelabrum and some dishes, which could have been

intended for presentation to influential natives. The likely origin of the bronzes is Etruria, Campania or southern Italy. The cargo amphoras are from a wide range of sources, including Mende, Thasos, Sinope, Corinth, Samos, Panticapaeum (?), Chios (?) and Rhodes (?), Sicily, and Malta or elsewhere in the Punic world. Such a collection must have been assembled first at a Greek port (e.g. Piraeus) and then reassembled at a Punic port, probably Carthage, for transshipment on (to Spain or Gaul), though a single transshipment at Syracuse is also possible. There were also about twelve large pithoi. Twenty upper and about ten lower stones of lever-mills were packed on edge at the foot of the hold, and many pierced stones (moulds ?) were reported in an early account (Fernández-Miranda, 1971). There were also two large 'Morgantina' or 'Pompeian' type rotary mills, the earliest firmly dated examples. Most of the lever-mills are of stone from Pantelleria; one is from Nisyros in the Aegean, and one of the rotary mills is of stone from Mulargia in Sardinia. There was a substantial amount of Attic fineware, including Red-Figure vases. About one-third of the painted vases were bell-kraters, one-half stemless cups, and the rest skyphoi and squat lekythoi. All are noticeably of small size. The kraters are by the Black Thyrsus painter, the skyphoi by the Fat Boy Painter Group, and the cups by the Vienna 116 Group. The relationship of these painters is not certain; they could all have worked in one workshop. Similar assemblages (representing the same kind of cargo) have been found (on land) at Olynthus, Santa Agata dei Goti, Enserune, and in Spain; the chief western entrepôt for distribution must have been Ampurias. In addition to the Red-Figure decorated pottery, there were hundreds of vessels in plain black-gloss ware, in 19 forms, including lamps. Some of the coarseware may also have been cargo; there was a range of forms, including jars made at Ebusus (Ibiza). In fact even the 'Greek' shapes may have been made outside Greece.

There were quite a few graffiti on the pottery. One, incised on a plate in the potter's workshop, reads **YMHONIONZOI**, perhaps for *hēmionion soi*, 'a fish-plate for you'. The others were all post-firing graffiti, and include numbers (10 (?), 35 and 40), indicating how many items were in a lot. There are also brief Greek inscriptions (such as **A**, **ΦI**, **ΑΠ** and **XA**) which are no doubt abbreviations of names; some are written retrograde, unusual in the 4th century BC - perhaps an indication that they were scratched by someone whose native language was not Greek. Other graffiti are in Punic, and are certainly personal names: *m'b* (= *mlkb'd* or *mlqrt'bd*), *b'h* (= *b'hlm*), *k'* (= *klb'lm*), *'tn* (= *'bdtnt*), *nmt* (= *n'mt*), *'r* (= *'bdmlqrt*, *'bdrsp* or *'bd'sgrtrt*) and *gt* + caduceus. Not enough of this pottery was recovered from an excavated context to say anything of the lading, but it seems likely that each name is that of a merchant to whom a group of pots belonged.

Some fragments of vines (with earth adhering) were evidently also being carried for trade. There were at least three copper ingots, and, among remains of ropes, bags and baskets (probably of esparto) were some which retained impressions of some rectangular or prism-shaped ingots; these, and other, smaller ingots or weights, may have been of silver. There were numerous beads (of amber and chalcedony) and counters (of wood, amber and shell); some of the counters are perforated, and could have belonged to a bead-frame. A bone plaque, engraved with a figure scene, was doubtless part of a box; a marble statuette and part of a bronze figurine and three gold rings were among other finds, presumably personal property. Other finds include a slingshot, a needle, and remains of olives, almonds, hazels and pistachios.

The ship's hull was very closely and strongly framed; the frames are 25-28 cm wide, 23 cm apart, and (unusually) are less thick than they are wide. The hull was lead-sheathed; a lead tube of rectangular section presumably belonged to a pump, and some bronze sheet of unknown use was also found. A stone anchor-stock from the site is the latest dated example of this kind of stock.

The makeup of the cargo reveals the importance of Punic merchants in the W. Mediterranean; the luxury goods and domestic equipment sought by the Iberians

were supplied principally by traders from Carthage and W. Sicily. The date of the wreck can be clearly established by the Red-Figure pottery, the black-gloss lamps and some of the Punic pottery, which all indicate the years leading up to c. 350 BC; a date shortly after the middle of the century, however, is regarded as possible by Morel (1981) and Guerrero, and likely by Koehler. The wreck of El Sec is of especial importance, as the earliest well-preserved classical shipwreck to have been archaeologically excavated, even in part.

Main accounts: Pallarés, 1972; Arribas *et al.*, 1987. Rouillard & Villanueva-Puig, 1989, include a synoptic version of Arribas *et al.*, as well as wide-ranging discussion of the site. See also: Cerdá, 1971; Fernández-Miranda, 1971; Pallarés, 1974; Morel, 1975; 1981: 62; Gianfrotta, 1977: 289; Koehler, 1979a: 47; Parker, 1979b: 18-21; Guerrero, 1986: 149-156; Williams-Thorpe & Thorpe, 1990.

Information: D. Cerdá.

### **SECANION, LE**

**1059**

Map 5

France

43° 32' N. 7° 6' E. 'L'epave du Sécanion' (or Séquanion), off Juan-les-Pins; 200 m E. of the Sécanion buoy, on the slope of a reef which rises to 5 m below the surface. Depth: 26 m.

Roof-tiles.

c. 10 BC-AD 40.

A well-preserved cargo of 'several hundred' tegulae and imbrices lay among sea-grass near Juan-les-Pins. The tegulae were more numerous; they were stacked in three rows. They were marked with a triangular signature (not a Greek delta), similar to one found on the tiles of Les **Mèdes A.** The imbrices were laid flat, head-to-toe. An early Dr. 20 amphora and a sestertius of a Roman moneyer of 23-17 BC date the wreck in the early Julio-Claudian period. Other shipboard items found were a mortarium, a coarseware pitcher and a lead lid, 15 cms in diameter. The tiles rested on bedrock, and the ship's hull was not preserved.

Clergues, 1973: 120-2; Pollino, 1983; Joncheray, 1987a: 72-80.

Information: F. Carrazé.

### **SECCA DEI MATTONI**

**1060**

Map 9

Italy

40° 54' N. 12° 53' E. Between Ponza and Palmarola islands; at the foot of a reef which rises to 2 m below the surface (and caused the loss of a modern brick cargo, hence its name). Depth: 30 m.

Amphoras and pottery.

c. 100-50 BC.

A well-preserved wreck has been partly excavated by S. Bertuzzi. The amphoras are of forms Dr. 1B and 1C, and of a third form (not illustrated in the preliminary reports), either a type of Lam. 2 or spheroidal. Many of the Dr. 1 amphoras, packed in place with straw, retained their cork stopper, held in place (unusually) by both a clay lid and a mortar sealing; one mark on a sealing has been read, bearing the name of Aulus Saufeius. There was also a considerable load of black-gloss pottery, comprising cups, plates, jugs and unguentaria of

brown or grey clay. Both the amphoras and the pottery are probably of Campanian origin; the amphoras could have contained wine produced on Ponza itself. It is not clear whether a spheroidal amphora, illustrated in a brief notice announcing the discovery, really came from this site. The ship's hull was preserved, but has not yet been studied.

Gianfrotta, 1986: 219; Picozzi, 1988a; cf. Archeologia Viva, 5. 4 (1986): 6; Bertuzzi, 1988.

**SECCA DEL BAGNO** 1061 Map 11 Italy

38° 28' N. 14° 53' E. At an isolated rock, 500 m off the W. coast of Lipari island; the wreck, lying on a steep slope, is partly covered by fallen rocks. Depth: 50-60 m or more.

Amphoras. c. 200 BC (?).

A much-looted wreck of Graeco-Italic amphoras, lying at the limit of safe compressed-air diving, was explored in 1962-3. Eight amphoras (six Graeco-Italic, one small Graeco-Italic, and one of unidentified Greek form) were raised. The Graeco-Italic amphoras (of Will type D) are very similar to those of **Grand-Congloué A**, and can thus be dated at the very beginning of the 2nd century BC or a little later. A lead anchor-stock (1.49 m across) decorated with two 'bosses' (shells ?) on each arm was also found.

Will, 1982: 352; Bernabò-Brea & Cavalier, 1985: 65-6.

Information: G. Kapitän.

**SECCA DEL MIGNONE** 1062 Map 7 Italy

42° 10' N. 11° 44' E. (approx.). On Mignone reef, N. of Civitavecchia. Depth not reported.

Pottery. 13th century AD.

Nothing definite is known of a site which has produced much pottery, including glazed bowls of Arabic or S. Italian origin.

Gianfrotta, 1981c: 84.

**SECCA DEL PALO** 1063 Map 7 Italy

42° 49' N. 10° 19' E. (?). On Elba; detailed location and depth not reported.

Amphoras. c. 150-25 BC (?).

Many Dr. 1 amphoras, broken, have been reported, without further detail.

Pallarés, 1983b: 181, no. 5 (citing G. Brambilla).



**SECCA DELLA CROCE****1064**

Map 7

Italy

42° 23' N. 10° 54' E. Off the NE. point of Giglio island. Depth: 30-40 m.

Amphoras.

1st century AD ?

Only a summary mention has been published of a wreck with Roman amphoras, possibly of Dr. 2-4 form.

Bound, 1988c: 192.

Information: M.A. Haigh.

**SECCA DI CAPISTELLO****1065**

Map 11

Italy

38° 26' N. 14° 57' E. 200 m from La Secca di Capistello ('Punta Secca'), Lipari; sometimes called the 'Schlagger Wreck' after the archaeologist who died diving on the site in 1969. Depth: 55-88 m.

Amphoras and pottery.

c. 300-280 BC.

The wreck lies on a 45° slope; though material is scattered down the slope in a 20 m wide strip, the nucleus of the cargo and part of the hull are well-preserved where they were held by a large projecting rock at 60 m depth. In 1976-7, D. Frey and D. Keith of INA carried out a limited excavation using trainee commercial divers on an oxygen-helium mixture. The main cargo comprised Graeco-Italic amphoras, Will type A1; the great majority were stamped with abbreviated Greek names, Pare (the most frequent), Pist, Charēs, Par, Biō, Diō, Pop and Euxenou. Some amphoras were recovered with cork stoppers, sealed with pitch, still in place; samples of their contents have revealed olive, pistachio and grape pips, as well as unidentified fibres. These amphoras were very likely made in Sicily. There were also some Punic amphoras, type Mañá Clb, probably cargo, too. A considerable quantity of black-gloss pottery included cups, lamps and 'fish-plates'. The origin of this pottery is not definitely established; the rosette stamps on some of the cups resemble those of the 'Atelier des Petits Estampilles', and there are parallels with the black-gloss products of Ischia, but to a number of specialists the pottery appears to be, not of Italian origin, but from Carthage or a Punic city in Sicily.

Few shipboard items have been excavated; they include a small pottery pitcher, several small lead weights, and a wooden toggle. Three lead bars may have been components of anchors, and a grooved stone, too, may have served as an anchor or a sound; a broken iron anchor was also found, though its association is not certain (but see **Montecristo A** for another early iron anchor). The amphoras lay on brushwood dunnage, and there were ballast stones on board.

The ship was evidently larger than the (contemporary) **Kyrenia** ship, with thicker timbers; copper nails (clenched internally) were used to fix planking to frames, and iron nails have been found. No lead sheathing was observed; the hull was pitched internally.

There may be other wrecks in the vicinity; a Dr. 1 amphora has been seen on the slope, and a late Roman amphora was raised in 1962.

Blanck, 1978; Frey *et al.*, 1978; Keith, 1979; Morel, 1981: 62 & 297; Guerrero, 1986: 159; Bernabò-Brea & Cavalier, 1985: 53-64.

Information: H. Blanck; D. Frey; G. Kapitän; R.G.M. Piercey.

Secca di Capo Graziano: see **Capo Graziano**.

Secche del Campese: see **Giglio Campese**.

**SECHE DI UGENTO A & B**                      **1066-1067**                      Map 10                      Italy

39° 49' N. 18° 9' E. On the Ugento shoal, near Capo Santa Maria di Leuca (S. of Gallipoli). Depth: 6-8 m.

**A.** Amphoras.                                      c. 50 BC-AD 100 (?).

**B.** Amphoras.                                      Mid 2nd-late 1st century BC (?).

A survey of the Secche di Ugento by G. Roghi in 1959 found two concentrations of broken amphoras, the scattered remains of two shipwrecks. One (wreck A) had a cargo described as 'Greek or Rhodian' amphoras, more probably Dr. 2-4; the second (wreck B) was of Dr. 1 amphoras.

Roghi, 1959: 315-6; Desy, 1983: 188.

**SECHE DI UGENTO C**                      **1068**                      Map 10                      Italy

39° 49' N. 18° 9' E. (approx.). Off Torre San Giovanni, on the approach to Ugento; detailed location and depth not reported.

Amphoras.                                      7th century AD (?).

The remains of at least one Byzantine cargo lie on the Secche di Ugento. A published amphora is globular, perhaps from Sicily or S. Italy, with the Greek graffito michail eus | taphiou.

D'Andria, 1979: 223 & pls XCIII-XCIV; cf. Milella, 1989: 540.

Secche di Vada: see **Vada**.

**SEDOT YAM**                                      **1069**                      Map 14                      Israel

32° 29' N. 34° 53' E. Close to the S. beach of Kibbutz Sedot Yam (S. of Caesarea), just S. of a reef. Depth: 2-3 m.

Amphoras.                                      5th-6th centuries AD.

A scattered deposit of Gazan amphoras (Keay form 25) appears to represent a Byzantine wreck.

Raban, 1989: 234 (citing E. Galili).

### **Sénèmes-Ponteau (France)**

A site reported by Benoit (1960: 43, no. 3) is probably not a shipwreck.

### **Senigallia (Italy)**

Several amphoras, brought ashore from the Adriatic off Senigallia over the years, may be from a wreck; none has been published.

Profumo, 1986: 42.

Sequanion: see **Secanion**.

### **SERÇE LİMANI A**

1070

Map 13

Turkey

36 34' N. 28 5' E. In the natural harbour of Serçe Limani (often spelt Liman), SW. of Marmaris; the wreck lies in deep sand, close to the steep, rocky shore. Depth: 32-34 m.

Amphoras and glass.

c. AD 1025.

The 'Glass Wreck' of Serçe Limani is one of several ships which sank in the harbour, probably owing to a sudden change of weather. The site was excavated by G. Bass and F. Van Doorninck in 1977-9; post-excavation and reconstruction are still in progress. The main preserved cargo (for there is space unoccupied) was some 3 tons of broken glass vessels and glass cullet, packed in cylindrical baskets (now vanished); the broken glass includes deformed pieces, suggesting factory waste, and rings, presumably also waste pieces. However, the broken glass includes over a hundred restorable vessels, even though the findspots of fragments on the site show the vessels had all been broken before loading a-board. Islamic glazed pottery bowls were also probably cargo, and so, too, was a basket (of which traces survived) in the stern part of the ship containing 80 intact glass vessels. Another consignment was of Byzantine amphoras, with Greek graffiti; these were lined with pitch and are thought to have contained wine. In the bows were living quarters, with fire-blackened pots, unbroken glass vessels, glass weights and wooden combs; a consignment of orpiment, glasses, glazed bowls and amphoras was associated in this area with a toilet-kit, coin-weights and cooking-pots no doubt belonging to an agent travelling with it. Another living area was located in the forward part of the after half of the hold; finds here included a bowl containing chicken-bones, a set of balance-pan weights, several iron swords and a wooden scabbard, and many lead net weights decorated with cast patterns. Other weapons found on board include an axe, 12 spears, and 50 iron javelins; these could have been for trade rather than defence. Towards the stern were found eight chessmen; in the bows, a gaming tableman (a simple disc shape). A hoard of a gold pendant and five silver rings was probably contained in a purse or bag. Identified plant remains from on board include almonds, grapes, olives, cherries and plums, and Pistacia vera and Rhus coriaria; the sumac and the (inferred) raisins may have been carried in quantity as cargo.

Shipboard items include ballast fore and aft (beachrock, chalk and limestone, and at least one mill-stone), and rigging pieces. There were eight Y-shaped iron anchors, of which one was stamped with Arabic letters; several of

them had been broken and repaired. A wicker basket contained various tools and spare nails. The ship's hull was very rounded, with a flat bottom; her water-line length was about 14 m, with a length/beam ratio of just over 3:1. The maximum cargo would be 37 tonnes, but a better working rating would be about 27 tonnes. The ship was built up with frames first, planks afterwards, but the shipwright was still working in a tradition of using planks to determine frame shapes amidships. The planks were not joined edge-to-edge. The ship was probably rigged with two lateen masts; she may have been built with special provision for carrying horses.

The weights include three dated probably to the year AD 1024/5. The weights and the complete glass vessels are of Islamic type, and a bucket bears an Arabic inscription; however, there were also Byzantine coins and seals, cooking-pots with Greek graffiti, bones from two pigs, and net-weights with Christian symbols. There is thus no definite evidence to assign ship or crew to a home area, since many items on board could have been acquired in either Byzantine or Arab ports. Lead isotope studies of glass and lead objects suggest four or five original sources in Anatolia and Persia, but study suggests that the glass and cullet were loaded at a single port, perhaps in Syria. Many aspects of the shipwreck can be matched with the picture of medieval trade provided by the Cairo Geniza archive.

Bass, 1978a; 1978b; 1979a; 1979b; 1984a; 1984b; Bass & Van Doorninck, 1978; Bass & Gölönlü, 1981; Van Doorninck, 1982; 1984b; Steffy, 1982; *INA Newsletter*, 10. 4 (1984): 1-2; Lawton, 1984; Matthews, 1985; Van Doorninck *et al.*, 1988; Haldane, forthcoming.

**SERÇE LİMANI B**

1071

Map 13

Turkey

36° 34' N. 28° 5' E. Near the entrance to Serçe Limani harbour. Depth: 34-35 m.

Amphoras and pottery.

c. 300-270 BC.

Partly excavated by C. Pulak and G. Bass in 1979-80, the wreck lies in deep sand, partly underneath a rock-fall. The cargo was over 600 amphoras of two sizes, with handle-stamps **ZHN** | **ΦΙΑΑ** and **ΝΦ[ ]**, of the 'Zenon Group'. It has been thought that some of the Zenon Group stamps are Egyptian, and that they are linked with Zenon of Kaunos, whose affairs are known from a papyrus archive; however, study of the amphora fabric by Empereur and Tuma indicates that they were made, not in Egypt, but in the Datça peninsula (near the wreck site), and are too early for Zenon of Kaunos anyway. On board the wreck there was also a stamped Thasian amphora. A minor cargo component was a consignment of small, handleless pots, perhaps for unguents; some coarseware jugs and necked jars may also have been carrying liquids as part of the cargo. The limited excavation also produced a selection of black-gloss ware, a pair of lever-mill stones and the lower stone of a hand-held rubber-mill. The hull was lead-sheathed, with fabric between the lead and the wood; a length of lead pipe could have belonged to a pump (not, however, the earliest known, as claimed by the excavators - see *El Sec*). A wooden toggle (for attaching lines to the sail?), a lead ring, and a marble ring with a double-hole becket were excavated; *inter alia*, this shows that such marble rings, used to free anchors, etc., were part of ancient ships' equipment. Remains of plants from the amphoras include fruits and capsules of *Sarcopoterium spinosum* (Thorny Burnet), a shrub used for packing and/or firewood; if this was freshly cut and brought on board for the ship's last voyage, she must have sunk in late May or early June.

Bass, 1974, site 2; 1975, site C (no. 15); Grace, 1986; Pulak & Townsend, 1987; Empereur & Tuma, 1988; Haldane, forthcoming.

**SERÇE LİMANI C** 1072 Map 13 Turkey

36° 34' N. 28° 5' E. In Serçe Limani harbour; over 100 m N. of wreck A. Depth not reported.

Amphoras and pottery. c. 150-100 BC (?).

The 'Scatter Wreck' of Serçe Limani was surveyed by INA in 1978-9. The cargo comprises Rhodian amphoras and pottery from the E. Mediterranean, apparently from Palestine.

Bass, 1981: 17.

**SERÇE LİMANI D** 1073 Map 13 Turkey

36° 34' N. 28° 5' E. Just inside the harbour mouth at Serçe Limani. Depth: 20-25 m.

Amphoras. 3rd-1st centuries BC (?).

A substantial cargo of Rhodian amphoras lies on a rocky slope; no details have been published.

Bass, 1981: 17.

**SERÇE LİMANI ZONE** 1074 Map 13 Turkey

36° N. 28° E. At an undisclosed location, 'about 35 km from Serçe Limani'; 70 m off shore. Depth: 25-36 m.

Glass vessels. Late 10th-11th century AD.

Only a brief report has been published of a recently-discovered wreck with an early Medieval glass cargo, like **Serçe Limani A**. Besides glass, other artefacts were found, and remains of the hull (including nails and caulking).

Pulak, 1985a (site 5).

**SÉRIPHOS** 1075 Map 13 Greece

37° 7' N. 24° 32' E. At the mouth of Livadhi Bay, Sériphos (Sérifos); on the E. side of a reef. Depth: 12-32 m.

Amphoras. c. 250-225 BC.

A wreck with Corinthian B amphoras lies partly on a rocky reef, partly in sand at its foot.

Touchais, 1986: 734; Kazianes et al., 1990: 225-8.

**SETE** 1076 Map 4 France

43° 14' N. 3° 56' E. (approx.). 18 miles SE. of Sète. Depth: 94 m.

Amphoras. 50-25 BC (?).

Nine amphoras of form Lam. 2 were caught in a trawl-net off Sète in 1968. Identical, they certainly represent a wreck; the profile of the amphoras suggests a date in the third quarter of the 1st century BC (later than **Planier C** or **Dramont A**).

Tchernia, 1969: 492-3.

See also **Frontignan**.

**SHAB RUMI** 1077 (Not mapped) Sudan

19° N. 37° E. At Shab Rumi, an atoll in the Red Sea, 40 km from Port Sudan; in shallow water.

Amphoras. c. 50 BC-AD 100 (?).

A number of amphoras were unexpectedly found at Shab Rumi by F. Dumas; there was no specific evidence of a shipwreck, but, failing more information about Red Sea traffic, the site is worth registering as a wreck. The amphora from the site which was shown to F. Benoit was identified as of Coan type, Roman period.

Dumas, 1972: 187-91.

**SHAVÉ ZIYYON** 1078 Map 14 Israel

32 58' N. 35 4' E. Off Shavé Ziyyon; 1 km from the coast. Depth: 9-11 m.

Terracotta figurines and amphoras.

Late 5th-early 4th century BC.

Material from this unusual wreck (but cf. **Tyre G**) is scattered over an area 1 km x 300 m, though the nuclear area of the site is denser, with a deposit up to 0.7 m thick. Several hundred figurines have been raised (from an estimated 5,000 or 10,000 originally on site), mostly very concreted. They show a goddess, with, on the base, the 'sign of Tanit', or, in some cases, a dolphin. Thirty-two types have been identified; neutron activation analysis points to a local source. There were also a large number of amphoras, 'Persian jars' (cf. Zemer nos 19-21); these, apparently, help to date the wreck to the end of the 5th century BC.

Linder, 1973.

Information: M. Prausnitz; E. Linder.

For another site near Shavé Ziyyon, see **Philadelphia**.

**SHEYTAN DERESI** **1079** Map 13 Turkey

37° 0' N. 27° 41' E. (approx.). In Sheytan Deresi ('Devil's Creek') on the N. side of Kerme Gulf; scattered at the foot of a rocky slope. Depth: 34 m.

Pottery jars. c. 1600 BC.

The site, excavated by G. Bass (1973-5), proved to be a cargo of pottery jars, probably of local origin, but showing Minoan influence, datable between 1650 and 1550 BC. No timbers were found, and only some 17 storage jars, amphoras and large jugs. 'Several baskets' of smooth stones were apparently ballast. The excavator concludes that the site represents the wreck of a small ship which, after sinking, caught on the base of the rocky slope and spilled its cargo on to the nearby sand.

Bass, 1975, site B; 1976; 1977.

**SHIANT ISLANDS** **1080** Map 15 Britain

57° 53' N. 6° 20' W. Found lying on land.

No cargo (?). Roman period (?).

The remains of what must have been a Roman ship were found on a beach at this relatively remote location in NW. Scotland in 1922.

Ellmers, 1972: 280, no. 19; Lethbridge, 1952: 139 ff & fig. 27. 2.

Shiqmona: see **Hof HaCarmel B**.

**Šibenik (Croatia)**

A wreck with at least 2,000 amphoras off Šibenik was reported by M. Nikolanci (1961: 25); no reference to the site by this name can be found in later publications, and it is probably identical with some other site, such as **Plavac** (q.v.).

**SICILIAN CHANNEL** **1081** Map 1 -

37° 10' N. 11° 20' E. (approx.). About 30 km ENE. of Cape Bon (Tunisia), between the cape and the W. end of Sicily. Depth: 530 m.

Amphoras. c. 400 BC (?).

An unmanned Italian submersible came across more than two dozen complete amphoras in offshore waters. The amphoras were spread over an area at least 50

x 35 m in extent; they lay mostly free of the bottom, and did not form a tumulus. The photos taken by the submersible's cameras and from the TV monitor do not show the amphoras quite clearly enough to determine their exact shape, or indeed if they are all the same; the form is fairly common in Sicily and was probably made there. Consideration of parallels suggests a date at the end of the 5th century BC, rather than its middle, as suggested in the published reports.

Barbieri, 1977a; Barbieri & Purpura, 1977.

An amphora of similar form was found and raised from another site, 500 m deep, 10 miles away; in this case there were no other finds or evidence for a wreck (Barbieri, 1977b).

For a possible association of Afr. 2A and 2C amphoras in the Sicilian Channel, see Purpura, 1977: 59.

**SIDI AHMAD** 1082 Map 1 Libya

32° 10' N. 15° 10' E. In the NW. part of the harbour of Sidi Ahmad, E. of Misurata. Depth: unknown.

Marble columns. Roman (?).

During underwater surveying for a new harbour in the 1970s, two long columns of white marble with green veins were found. The finders presumed that they must be Roman, probably from a shipwreck. Later searchers failed to relocate the site, but it may well be a wreck (cf., for example, **Camarina A**).

Unpublished.

Information: O. Hackett.

**SIDON** 1083 Map 1 Lebanon

33° 34' N. 35° 20' E. (approx.). At an unspecified site near Sidon, in shallow water.

Amphoras, etc. 1st century BC.

A brief note states that, at a site where a dredger had brought up timbers, many fragments of amphoras and other pottery of the 1st century BC were found.

Marx, 1974.

**SILBA A** 1084 Map 8 Croatia

44° 23' N. 14° 41' E. (approx.). One of several wrecks on Silba; exact location and depth not reported.

Amphoras. c. AD 300-425 (?).



A wreck with African amphoras (probably but not certainly cylindrical) has been summarily reported.

Brusić, 1980: 162 & 166.

**SILBA B** **1085** Map 8 Croatia

44° 20' N. 14° 49' E. At the S. end of Silba; depth not reported.

Amphoras. 1st century AD (?).

A wreck with Rhodian amphoras of the Roman Empire period has been briefly reported; the date is probably 1st, rather than 2nd, century AD.

Brusić, 1980: 162 & 166.

**SILBA C** **1086** Map 8 Croatia

44° 23' N. 14° 41' E. (approx.). On Silba; location and depth not reported.

Tiles. Roman period.

A wreck with a cargo of tegulae and imbrices has been summarily reported.

Brusić, 1980: 162.

**SILBA D** **1087** Map 8 Croatia

44° 20' N. 14° 43' E. On the S. tip of Silba; depth not reported.

Glass. Medieval period.

No details have been published of a medieval glass wreck on Silba.

Brusić, 1980: 165-6.

**ŞİLE** **1088** Map 1 Turkey

41° 11' N. 29° 38' E. Near Şile (on the Black Sea); 400 m from the coast. Depth: 6 m.

Marble. c. AD 100-125 (?).

A rescue excavation of a site discovered by divers raised part of the cargo of a ship which sank on a sandy bottom in shallow water. Two 10-foot long columns (in finished state) and a large block are of green breccia, probably verde antico from Thessaly. The rest of the marble is Proconnesian, and comprises five Ionic capitals, a column-base, two large blocks and a plaque, some items still roughly quarried, others half-finished. There are also the half-finished colossal statue of a cuirassed emperor (4.5 m high), a large female bust which

might be of the Trajanic period (early 2nd century AD), a sarcophagus lid, a stele and two bowls. The architectural fragments do not fit together, and there is probably more marble on the site. Some metal objects and timber, presumably from the ship's hull, were also found.

Mellink, 1973: 191 & pl. 38. 38; Beykan, 1988.

Sinis: see **Mal di Ventre**.

**SINUESSA A** 1089 Map 9 Italy

41° 7' N. 13° 51' E. (approx.). Off ancient Sinuessa (NW. of Mondragone); depth not reported.

Amphoras. 3rd century BC.

A wreck of Graeco-Italic amphoras, Will type A1, has been explored by local divers. The amphoras are probably not of local manufacture.

Arthur, 1991: 112.

**SINUESSA B** 1090 Map 9 Italy

41° 7' N. 13° 50' E. (approx.). Said to lie off Sessa Aurunca. Depth: 15 m.

Lamps. c. 50-1 BC (?).

An impressionistic account refers to the discovery of a concreted group of lamps, near some bricks. The lamps are not illustrated, but their description, referring to no decoration other than a cordon of beading, suggests Italian lamps of the second half of the 1st century BC. The lack of circumstantial evidence makes the site only a probable shipwreck, though the eight or so lamps raised were probably all of the same type and showed no sign of having been used.

Picozzi, 1976.

**SIRACUSA A** 1091 Map 11 Italy

37° 2' N. 15° 18' E. In the Great Harbour of Syracuse; presumably at Scoglio della Galera, and in relatively shallow water.

Amphoras. c. 450-430 BC.

A scattered wreck contained Corinthian amphoras of types A and B, datable to the third quarter of the 5th century BC. A pithos and some pottery and anchors have been found. It is possible that the site is anchorage material rather than a sunken cargo, but on balance a shipwreck seems probable.

Illustrated London News, 234. 6246 (21 February 1959): 298 ff; Baker, 1961; Koehler, 1979a: 17.

Information: C.G. Koehler.

**SIRACUSA B** 1092 Map 11 Italy

37° 2' N. 15° 18' E. In the Great Harbour; exact location and condition not known.

Amphoras. 5th–7th centuries AD.

A group of Byzantine amphoras, evidently from a wreck, was raised in the 1950s; no details of the site have been reported.

Cf. Baker, 1961.

Material seen by the writer.

**SIRACUSA C** 1093 Map 11 Italy

37° 2' N. 15° 18' E. In the Great Harbour; exact location and condition not known.

Amphoras. 5th–7th centuries AD.

A second Byzantine wreck in the Great Harbour, known to P. Gargallo and G. Kapitán as 'Porto Grande D', remains unpublished.

Information: G. Kapitán. Material seen by the writer.

**SIRACUSA D** 1094 Map 11 Italy

37° 3' N. 15° 18' E. (approx.). Outside the Small Harbour; details not known.

Amphoras. Roman period.

A Roman amphora wreck near the Small Harbour of Syracuse was discovered by E. Maiorca in 1978, but it has not been possible to get details of the site.

Information: G. Kapitán.

**SITHONIÁ** 1095 Map 13 Greece

40° 2' N. 24° 5' E. (approx.). Near the SE. corner of Cape Sithoniá; on a rocky reef between two islands. Depth: 12–15 m.

Amphoras. c. 400 BC.

Fragments of amphoras were found in 1977, strewn on a reef which rises close to the surface in places. To judge by photos (unpublished), the cargo (whether all, or just a part) was of late 5th century BC Mendeian amphoras.

This may be the site, or one of the sites, looted by a tourist, who was said to have raised 52 amphoras, mostly 4th-3rd century BC, off Sithoniá in 1981.

Touchais, 1982: 578 (from a press report).

**ŠKARDA A & B** **1096-1097** Map 8 Croatia

44° 17' N. 14° 41' E. At the NW. tip of Škarda; depth not reported.

A. Amphoras, form Lam. 2/Dr. 6. 1st century BC/AD.

B. Tiles (tegulae & imbrices). Roman period.

Only a summary report has been published of these wrecks.

Brusić, 1980: 159, 162 & 166.

**Škerki Bank**

Nothing is known of a large deposit of amphoras, discovered by a professional diver in relatively deep water between Tunisia and Sicily (Purpura, 1977: 67, note 1).

For another deep-water site off W. Sicily, see **Isis**.

**ŠKOLJIĆ** **1098** Map 8 Croatia

44° 38' N. 14° 14' E. Near Školjić rock, at the end of a shallow reef on the W. side of Uniže island. Depth: 36 m.

Amphoras. Mid 1st-2nd century AD (?).

Amphoras of more than one form were raised from a wreck in deep water: some were a derivative of Dr. 2-4, others pear-shape (of Italian origin?). Remains of the ship and her equipment included two iron anchors, and the ship's iron 'fireplace' found together with fine pottery and cooking equipment.

Matejčić, 1976: 352-3; Brusić, 1980: 159; Orlić & Jurisić, 1986a: 43.

**SKOPELOS** **1099** Map 13 Greece

39° 5' N. 23° 35' E. (?). At an unknown location off Skopelos island; depth not reported.

Pottery and amphoras. Late 12th century AD.

A group of material in Oxford appears to have been raised from a wreck off Skopelos before 1960. The pottery is 'Aegean Ware', with incised geometric or animal motifs, and sgraffito or painted ware, with a geometric design. The amphora fragments have not been published. The material is later than **Pelagós**, earlier than **Kastellórizon**.

Armstrong, 1991.

Skopelos: other sites

Two deposits on Skopelos, one early Imperial, the other Byzantine (?), were reported by S. Whitaker (1970), who added: 'their depth and location suggest they may not be wrecks but remains of an ancient settlement long since covered by the sea'.

**SOBRA** 1100 Map 1 Croatia

42° 43' N. 17° 36' E. On the S. side of Cape Pusti, in Sobra (or Sovra) bay (Mljet); 50 m from land, on a shelf at the foot of a cliff. Depth: 30 m.

Amphoras. c. AD 320-340 (?).

A large cargo of late Roman amphoras, estimated at some 1,000 originally, has been partly excavated by A. Kisić. The extent of the deposit, and the dimensions of the timbers uncovered, suggest the ship was 25 m long. At least 170 whole or fragmentary amphoras were raised. The majority are African, cylindrical, whether with everted rim (one stamped **PGT**), with almond-section rim, or of Femmina Morta type. In smaller number are Al. 50 amphoras, with yellowish-brown, friable clay. There are also consignments of pear-shape amphoras similar to Panella 46, with Greek dipinti, and three kinds of flat-based jars, some of which contained olives. Most of the amphoras were stopped with a cork, and were laid on vine twigs in the ship's hold. The ship was definitely sheathed in lead, one of the latest known examples. There were two iron anchors on board. Not many small finds were excavated: some t.s.chiara D, a cooking pot of African type and a jug which looks like a t.s. chiara derivative, i.e. all suggesting an African home port. The cargo, however, includes both African, Lusitanian, Italian (?) and Greek (?) amphoras and jars, no doubt the result of at least one trans-shipment in an entrepôt.

Kisić, 1987.

Solunto: see **Scoglio della Formica**.

**SORRES, LES, A-F** 1101-1106 Map 4 Spain

41° 17' N. 2° 0' E. Six wrecks (at least) found in sand-quarrying in the delta of the R. Llobregat, E. of Castelldefels (SW. of Barcelona). The wrecks lie on the ancient sea-bed, between 5 and 14 m below modern sea-level; loose finds indicate this was an anchorage in antiquity.

**A.** c. 150-75 BC (?).  
A wreck with Dr. 1A amphoras and iron ingots like those of the **Cap Gros** wreck; the hull was preserved. Three iron anchors were found.

**B.** 1st century BC-2nd century AD (?).  
A large heap of blocks of iron, oxidised and concreted, together with a coarseware jug (Vegas 44).

**C.** c. AD 25-100 (?).  
Dolia, Dr. 2-4 amphoras of Tarraconensian type, lead ingots weighing 43 kg and remains of the ship. The dolia have a fabric with white specks which resembles the Tarraconensian amphora fabric, so they may well be of local manufacture.

**D, E & F.** Roman period.  
No details of these wrecks have been reported. Two make up the total of five wrecks with hull preserved mentioned in the published report, and the sixth must be the cargo of tegulae also listed there.

Izquierdo, 1987.

**SOZOPOL** 1107 Map 1 Bulgaria

42° 25' N. 27° 42' E. In the harbour of Sozopol (Apollonia Pontica). Depth not reported.

Amphoras. 5th-3rd centuries BC (?).

A deposit of Heracleian amphoras, found at Sozopol, is thought to be a wrecked cargo. No details of the site have been reported.

Lazarov, 1985: 138.

**SPARGI** 1108 Map 6 Italy

41° 13' N. 9° 20' E. In the Maddalena islands (Sardinia); the wreck lies closely NW. of Secca Corsara, 500 m S. of Spargi island. Depth: 17-18 m.

Amphoras and pottery. 120-100 BC.

The large and rich cargo of the Spargi ship, discovered in 1957, was partly excavated before it was looted. Archaeological excavations have subsequently continued (since 1976, under F. Pallarés). The main cargo comprised amphoras of forms Dr. 1A and 1B; there were also some ovoidal amphoras, making up about 12% of the cargo, and quite a number of small Rhodian amphoras. (Gianfrotta & Pomey mention a Lam. 2 amphora, but this is not corroborated and may be an error). A great quantity of black-gloss pottery lay stacked in the hold. Only 400-450 amphoras, in two layers, are accounted for; since the ship was evidently at least 30 m long, the amphoras took up only one-sixth of the hold, so either a good deal was salvaged or there was a perishable cargo too.

The Dr. 1B amphoras were stamped **SAB**, and sealed with a mortar sealing stamped with the sign of a bearded head. The Dr. 1A amphoras bore stamps which Lamboglia thought were Oscan, but which Panella considers were incorrectly drawn in the first report and were in fact Latin; she suggests they came from near

Sessa Aurunca (Sinuessa) in the Ager Falernus. The date of the wreck (in the last years of the 2nd century BC) seems firmly established, despite the doubts expressed by Hesnard & Lemoine, Will and Arthur (who date it in the first quarter of the 1st century); among recent excavation finds are two coins, one from the mast-step, which (when studied) may settle the question finally. The black-gloss pottery lay nested in piles, and was certainly cargo; there are thousands of pieces. The fabric is related to Camp. B and comes from N. Campania or S. Latium; there are shallow dishes, plates (of two sizes), cups and bowls of several forms.

Other finds included several moulded glass alabaster. A number of worked or half-worked stones have been reported; these may in fact be glass counters (illustrated by Pallarés, 1986b) and belong, together with beads of glass and lapis lazuli, glass and bone pendants, amulets, buttons and pins, a ring with an engraved crystal stone (showing a ship with a helmeted steersman) and a rectangular bone box with decorated lid, to the personal belongings of those on board. Shipboard supplies included an amphora of unusual shape (a variety of Dr. 1A ?) and some fragments of an amphora apparently of form Dr. 28. Some Camp. A pottery (not more than 100 fragments) probably belongs to the ship, not the cargo. A fair selection of Greek fineware, both Megarian and from another centre such as Pergamum, indicates that the ship's port of origin was very likely Delos, which flourished as a port in the years following the pacification of Asia Minor in 126 BC. Other pottery included 'presigillata' in several different fabric varieties, fine-wall ware, lamps, red-and-black bowls, fusiform unguentaria, lagynoi, a dolium fragment, and a variety of coarseware.

Finds of marble objects included two small columns and two altars, doubtless from a shrine; a marble basin and stand probably also belonged to this part of the ship, together with a bronze candelabrum and a three-spouted bronze lamp, two infundibula (ladles), two bronze pitcher handle appliques, the bronze decoration from a niche or doorway, and a statuette. Recent finds include pieces of carved wooden furniture - a lion's head and a leg with floral ornament. Much of this shipboard material was looted between 1960 and 1964. It is thought that the shrine group came from the middle of the site, which is consistent with the sacrifice scene shown on the Torlonia relief. Whether basins (louteria) were used on board ships for washing, eating or sacrificing, or for all these, remains unclear.

Another dramatic find was part of a bronze helmet, with part of a skull attached to the interior, and (recently) a cuirass; also a spearhead (and the remains of a ?knife). Especially before the clearance of pirates from the Mediterranean by Pompey, it is not unexpected to find armour and weapons on board merchant ships; however, shipwrecks of all periods (pace Gianfrotta, 1981b) have produced such objects. Whether they were worn by private guards or (under the Empire) by Roman soldiers in charge of prisoners or state property on board. (It is, of course, also possible that small quantities of weapons were carried by way of trade, even in the Imperial period).

No fewer than five sounding-leads have been found in the wreck, according to Mocchegiani, who suggests that they represent, not the ship's equipment, but weights used by Roman salvage divers.

The hull of the Spargi ship is in poor condition; it lies on an uneven bottom, with protruding rocks. The keel has been effectively destroyed, and some copper sheathing crumpled, by a violent impact; this would have been with an attacking pirate ship, according to Pomey, or on the Secca Corsara, according to Ferrandi - one can suppose the latter, since no anchors have been found, which may imply a ship in trouble from the weather rather than one fleeing from pirates. The hull is extremely fine in section; the deep floors were, in some cases, bolted to the keel. The quality of the construction and the elegant lines emphasize the resources (and, doubtless, the profits) which were available to Roman and Campanian wine exporters of the late Republic, though it has been suggested that this was a private vessel rather than a common cargo carrier.

Roghi, 1965 (with references); 1966; Lamboglia, 1964c; Picozzi, 1977; Kapitán, 1979: 120; Ferrandi, 1980; Panella, 1980; Gianfrotta, 1981b; Hesnard & Lemoine, 1981: 251, note 32; Gianfrotta & Pomey, 1981: 141 & 339; Morel, 1981: 54; Will, 1984; 1986: 216; Mocchegiani, 1986: 127; Pallarés, 1983g; 1986b.

### **Sparviero (Italy)**

A mound of Etruscan amphoras, lying in mud at 36 m deep, SW. of Sparviero island (Tuscany), was discovered in 1972, according to a first report; subsequent enquiry failed to corroborate this, and the site must be either fictitious or located elsewhere. The single amphora deposited with the original report was probably made at Vulci and dates from the second half of the 5th century BC.

Another 'non-wreck' site off Sparviero has produced two dolia without any associated finds.

Talocchini, 1973; Bouloumié & Liou, 1976: 216, note 2; Cygielman, M. in Martelli et al., 1982: 45-8.

Spiaggia di Naregno: see **Naregno**.

### **Špinut & Split (Croatia)**

A collection of stamped Dr. 20 amphoras found at Špinut, near Split, was first published as a wreck cargo (by Cambi (1975) and Vrsalovic); later, however, it turned out that this was wrong and the group was merely a dumped deposit.

Cambi, 1975; 1983; Vrsalović, 1974: 53 & 240, no. 8.

**SPORADES A** **1109** Map 13 Greece

39° 10' N. 23° 45' E. (approx.). At an undisclosed location in the northern Sporades. Depth: 25-30 m.

Amphoras. 4th-3rd centuries BC.

A large cargo of Greek amphoras was discovered by a Greek sponge diver. The amphora tumulus measures some 30 x 20 m, and includes several forms, including Thasian.

Unpublished.

Information: G. Kapitán.

**SPORADES B & C** **1110-1111** Map 13 Greece

39° 10' N. 23° 45' E. (approx.). Close to wreck A. Depth: 40-50 m.



Amphoras. 11th-12th centuries AD (?).

Two cargoes of Byzantine amphoras lay close to wreck A, only 50 m apart, and apparently containing similar amphoras. These include pear-shaped amphoras (Günsenin Type 3) as well as other varieties. The tumulus of each wreck extends some 20 x 5 m.

For other amphora wrecks of this type, see **Syria B** and **Ždrijac**; for two broadly contemporary wrecks close together, cf. **Cabrera A** and **C**.

Unpublished.

Information: G. Kapitūn.

**STANIĆI-ĆELINA** 1112 Map 8 Croatia

43° 24' N. 16° 44' E. On a headland between Stanići and Ćelina, SE. of Omiš. Depth not reported.

Amphoras. c. 100-25 BC.

No detailed account has been given of the site of a Lam. 2 cargo in the Split area. Most of the amphoras are unstamped, but about 10 have two stamps, one on each side of the rim. Stamps reported are **ABING**, **KANI**, **MENOLA** and **PHIL.H**. A piece of lead sheathing has also been recorded.

Vrsalović, 1974: 53 & 240; Cambi, 1989: 315-8.

**STENTINELLO** 1113 Map 11 Italy

37° 7' N. 15° 15' E. Off the Neolithic settlement of Stentinello, in Santa Panagia bay (E. Sicily); approx. 600 m offshore. Depth: 9-11 m.

Amphoras and pithoi. 300-280 BC.

Two extensive areas of fragmentary amphoras and pithoi lie in what can be a sheltered anchorage. The large quantity of material and the extent of the site (at least 270 m E.-W. and up to 60 m across) suggest that there are two wrecks, separated by a sandy area 70 m across. However, the material from each part of the site is similar. The final report on surveys carried out before the bay became impossible to dive freely in (because of industrial development) is still unpublished.

The main cargo comprised Corinthian amphoras of types A and B, and a third form of amphora not yet identified. There were also several pithoi. Shipboard equipment included two terracotta louteria, some coarse pottery, and several bronze bowls and pots. The date, based on the Corinthian amphoras, can be placed in the first years of the 3rd century BC.

Kapitūn, 1976a; 1979: 101-3; Koehler, 1978: 236-7; 1979a: 21 & 39.

Information: C.G. Koehler; G. Kapitūn; A.E. Theunissen.

**STORI STONI** 1114 Map 8 Croatia

43° 10' N. 16° 23' E. In Stori Stoni (or Stari Stani) bay, near Izmetište point, Pakleni islands. Depth: 31-34 m.

Amphoras. Late 2nd-early 1st century BC.

A cargo of Lam. 2 amphoras was well-preserved, albeit partially looted; the cargo is estimated at originally 200 amphoras, which would scarcely have filled the ship, calculated to have been 15-18 m long. The amphoras bear stamps, including **VEN**, **AOLIPOR**, **CIA**, and **MI**. As well as full size amphoras, there were also two half-size, also of Lam. 2. In the bow area were found 50 amphora stoppers. The lead components of the pump were preserved, indicating the beam as 4 m. Study of the ship's timbers suggest the stern was the end where tegulae and black-gloss pottery were found.

Orlić & Jurisić, 1986b; 1987a; 1987b.

### Strasbourg (France)

Two wooden rafts, associated with late 1st-2nd century AD material, were found during canal-works at the Rhine harbour of Königshofen, near Strasbourg, in 1938. One raft, 12.15 m long, had three logs, squared, and tapered at one end; the other was 7.15 m long.

Ellmers, 1972: 106, 113 & 283.

### STRATON'S TOWER

1115

Map 14

Israel

32° 30' N. 34° 53' E. To the N. of the Roman harbour at Caesarea, close to shore. Depth: 2-3 m.

No cargo. Mid 1st century AD (?).

The hull of a heavily-framed Roman ship was found, deeply ensanded, outside the harbour area of Caesarea. The ship is estimated to have been 40 or even 45 m long, 9 m in beam; the hull, of 9 cm thick pine planks, with tenons of poplar and planking treenails of evergreen oak, was lead-sheathed. At the keel there was a second layer of planks, secured by copper nails. Broken dolia were found at the site, and it seems that they had been set in a muddy packing, containing straw, twigs and pine needles, which was found between the frames. Other finds included the bilge pump, sail rings, ropes, the legs of a folding bronze table, a silver ring and some balance-scales. A bone or ivory gaming die, with facing spots totalling seven, might be intrusive (there is a good deal of Byzantine pottery on the site). The origin of the timbers is S. Europe, perhaps Cisalpine Gaul or Liguria; a Greek numeral, **ΧΙΛΙΑΙΨΝ** (=1750), inscribed on a floor timber, must call that origin into doubt. <sup>C</sup><sub>14</sub> dates suggest the trees were felled before the mid 1st century AD. The ship sank in a natural cove which had probably been used to offload vessels bringing building materials for Herod's harbour. She is probably the heaviest ancient ship so far discovered under water.

Raban, 1981a; 1984; 1989: 184-98; Fitzgerald, 1989.

Information: A. Raban.

See under **Caesarea** for other wrecks in this vicinity.

**SUD-CAMARAT** 1116 Map 5 France

43° 11' N. 6° 41' E. (approx.). Detailed location and depth not reported.

Tiles. 1st-3rd centuries AD (?).

Little is known of a cargo of tegulae and imbrices to S. of Cap Camarat. The tegulae are stamped **LVF** (sometimes all or part retrograde), incuse in a cartouche. Part of an iron anchor was found at the site.

This is probably the site referred to as 'Cap Lardier' by Tchernia (1971b: 62, note 61).

Joncheray, 1987a: 83.

See also **Nord-Camarat**.

**SUD-LAVEZZI A** 1117 Map 6 France

41° 18' N. 9° 15' E. In the Strait of Bonifacio (Corsica); approx. 400 m SW. of Lavezzi reef. Depth: 36 m.

Amphoras. c. AD 375-425 (?).

A well-preserved wreck of late Roman amphoras of Spanish origin was discovered by commercial divers in 1974 and investigated in 1975. The cargo formed a mound 16.0 x 5.7 m, numbering not more than 450 amphoras; in the centre of the wreck there were two layers. The amphoras are mostly of form Almagro 51A, with smaller numbers of flat-bottomed amphoras, amphoras similar to Almagro 50, Almagro 51C, Beltrán 72 and Dr. 23 amphoras. At least one of the Almagro 50 amphoras was full of fish-bones, thought to be mackerel. There were no other finds, though anchors (presumably iron) and timbers were present at the site.

Liou, 1982: 437-444; 1987a: 120-3.

**SUD-LAVEZZI B** 1118 Map 6 France

41° 18' N. 9° 15' E. In the Strait of Bonifacio; approx. 400 m ESE. of Lavezzi reef. Depth: 42 m.

Amphoras and ingots of copper and lead.  
AD 10-30.

The cargo amphoras comprise Haltern 70 (of which at least one contained olives), several types of Dr. 7-11, and Dr. 20 amphoras, a Baetican assemblage comparable with **Port-Vendres B**. The amphora bottoms were carefully placed between the lead ingots. These comprised 95 ingots, arranged in 11 rows, numbering 9 ingots from port to starboard (except at the mast-step and in the first row forward); all bore the mould-mark **MINVCIORVM** and the counterstamps **AP.IVN** and **ZETH**, and graffiti indicating their weight (which averaged, in modern terms, 51-54 kg). The copper ingots, numbering 237, were stacked in piles fore

and aft of the lead; they weighed on average 20 kg and bore marks which have not yet been identified.

The wreck is dated by Arretine pottery, including a stamped piece; there was also a single Dr. 28 amphora. The ship carried nine anchors: three, of iron, lay at the stern, amidships and at the bow respectively; two more, with lead stocks, lay at the bow; and another lead stock, inscribed **AP.SE** (presumably short for the owner's name), was found forward of the ship. She is preserved to a length of 23.8 m, but part of the hull was caught on a projecting rock, so its complete dimensions have not survived.

Liou, 1982: 442-7; DRASM, 1985: 38-9.

**SUD-LAVEZZI C** 1119 Map 6 France

41° 19' N. 9° 15' E. In the Strait of Bonifacio; approx. 400 m E. of Lavezzi reef. Depth: 38 m.

Amphoras. c. AD 15-25 (?).

A cargo of amphoras, concreted to a rocky bottom, was declared in 1979; over 200 amphoras have since been excavated by the DRASM. The main amphora type was Dr. 2-4 from Tarraconensis; over half of these were stamped on the foot, or, sometimes, on the neck, with some 23 stamps (e.g. **A, AC, ALEX, CELSI, PHIL, QVAD**) of which some (from the same dies) have been found also at Chretienne H. A Pascual 1 and a Dr. 14 amphora were also found. The cargo was doubtless of wine from Tarraconensis.

Liou, 1982: 446-50; DRASM, 1983; Santamaria, 1984a: 35-6; Corsi-Sciallano & Liou, 1985: 130-44.

**SUD-PERDUTO A** 1120 Map 6 France

41° 20' N. 9° 18' E. In the Strait of Bonifacio, S. of Perduto island. Depth: 70 m.

Amphoras. c. 25 BC-AD 25 (?).

The cargo, lying on a sandy bottom, was discovered by a Naval midget submarine, which took photos and raised three amphoras. All the amphoras, whether raised or photographed, are of form Dr. 12; an Augustan date is likely on typological grounds.

Liou, 1982: 450-4.

**SUD-PERDUTO B** 1121 Map 6 France

41° 20' N. 9° 18' E. 'Sud-Perduto 2', about 800 m SW. of Perduto reef. Depth: 48 m.

Amphoras and lead ingots. c. AD 1-15 (?).

A concreted tumulus of amphoras, 16 x 5 m, was made up of various forms of Spanish amphoras of the Augustan period, generally similar to the range from La Longarina studied by Hesnard (1980). Most of the amphoras in the lower of the two layers found were of Dr. 7 and Dr. 9 forms, and many contained the remains of complete Spanish mackerel (*Scomber colias*); some Dr. 9 amphoras contained grape pips. In the upper layer there were also flat-bottomed amphoras of three types (one like Dr. 28), several Dr. 12, a 'Longarina 2' (cf. Dr. 10) and a single Oberaden 83 (early form of Dr. 20). Stacked on the mast-step at the foot of the mast were 48 lead ingots, in six layers of eight each. They bear maker's marks, including **EMPTOR SALVE**, **G.VACALICI**, **L.VALERI.SEVERI**, and **M.VALERI dolium ABLONIS** (cf. Cabrera E). Most of them are also stamped, with marks including **L.AGRI**, **C.CACI**, **PHILARG** and **P.TVRPIL GERM**. The ingots are incised with numerals, representing the difference between their actual weight and a norm of 100 Roman pounds (cf. Ses **Salines**), and, unusually, are pierced with one or more holes made by driving a nail through the lead, perhaps in the course of transportation from mine to coastal port in Spain.

Bernard, 1987; Pomey *et al.*, 1989; Bernard & Domergue, 1991.

Information: H. Bernard.

**SULCIS**    **1122**    Map 6    Italy

39° 4' N. 8° 28' E. Found in about 1933 during dredging at the harbour of Sant'Antioco (Sardinia). Silted.

No cargo.    Roman period.

A ship of classical construction, estimated to have measured 23 m long x 7 m beam, was found in the 1930s and has apparently not been preserved. Some Punic amphoras were found at the site, but these were not definitely associated with the ship. The ship is said to have been built of local pine for the 'skeleton' and the planking, oak for the keel, and turkey oak ('cerro') for the 'reinforcing pieces'. Nails, said to be iron, were driven through treenails and clenched.

Speziale, 1939; Ucelli, 1950: 250-1; Basch, 1972: 12-13.

**SUSAK**    **1123**    Map 8    Croatia

44° 30' N. 14° 18' E. At Susak island; detailed location and depth not reported.

Tiles.    Roman period (?).

A wreck with tiles, presumably Roman roof-tiles, at Susak (not to be confused with Sušak or Sušac) has been briefly reported.

Vrsalović, 1974: 53 & 240, no. 26.

**SVETI ANDRIJA**    **1124**    Map 8    Croatia

43° 1' N. 15° 45' E. Near Sveti Andrija, at the SE. point of Svetac; depth not reported.

Amphoras. c. AD 1-150 (?).

Only a brief report has appeared of an early Imperial amphora cargo, with some unspecified remains of the ship, at Sveti Andrija. The amphoras are said to be Dr. 2-4 and 'Peacock class 13', i.e. Richborough 527 (cf. **Palagruža B**).

Orlić & Jurišić, 1987c.

**SYRIA** 1125 Map 1 Syria

36° N. 35° E. (estimated). At an unspecified location off the coast of Syria. Depth: 35 m.

Amphoras and jars. 9th century AD (?).

A large tumulus of jars, each 1.7 m tall and 1.2 m in diameter, with a double lip and two handles, together with three-handled amphoras of Arab type, has been briefly surveyed by H. Frost.

Unpublished.

Information: H. Frost.

**SZÁZHALOMBATTA** 1126 Map 15 Hungary

47° 25' N. 18° 50' E. In the R. Danube at Százhalombatta (Matrica); depth not reported.

No cargo. 1st-2nd centuries AD.

A Roman boat, lying beneath a gravel bank in the river, was found during dredging. Thirty-five bronze vessels and some cooking equipment (unspecified) were recovered; finds also included 1st-2nd century AD pottery.

Thomas, E.B. in Lengyel & Radan, 1980: 391.

**TAGOMAGO** 1127 Map 3 Spain

39° 2' N. 1° 38' E. On the W. side of Tagomago islet, NE. Ibiza. Depth not reported. The wreck is referred to as 'Tagomago 1', but nothing has been reported of any other wreck here.

Amphoras. c. 500-450 BC.

The only amphoras found in this cargo were Punic amphoras (Mañá A4), which have been confidently dated to the first half of the 5th century BC. This is therefore one of the earliest non-Etruscan wrecks in the western Mediterranean.

Ramón, 1985.

**TAINARON** 1128 Map 13 Greece

36° 23' N. 22° 29' E. At Tainaron (Cape Matapan), the central peninsula of the Peloponnese; depth not reported.

Amphoras. 13th century AD.

A 'mixed wreck' includes at least one amphora of Gllnsenin form 3, according to a diver's photo.

Gllnsenin, 1990: 319 (citing V.R. Grace).

**TANGER A & B** 1129-1130 Map 2 Morocco

35° 48' N. 5° 49' W. (approx.).

Amphoras. 2nd century BC & 1st century AD (?).

Three scattered wrecks were discovered in Tangier Bay, according to Ponsich (1964: 262), and his pl. III illustrates the amphoras, which one might presume came from different sites, although the caption (evidently mistaken) attributes them to a site at Cap Spartel.

However, the map published in the same paper shows only two wrecks in Tangier Bay, but two at Cap Spartel. Likewise, in another paper (1966), Ponsich firmly states that a diving survey located two wrecks in the Bay and two at Cap Spartel. One of the latter is certainly the site described above, **Cap Spartel**, with a cargo of lead ingots. The other is probably to be identified with the amphora wreck mentioned in the 1964 paper as to the N. of Ras Achakkar, and listed in this Catalogue as **Ras Achakkar**.

Furthermore, a Roman fish-sauce cargo is briefly mentioned by Benoit, as lying at the foot of a reef in 'la rade de Tanger'. It is impossible to say whether this is Cap Spartel, Ras Achakkar, or one of the Tangier Bay sites.

The three amphoras illustrated in the 1966 paper (and correctly identified by Euzennat, 1971) are: (1) a 2nd century BC Graeco-Italic amphora (Will type E) (2) an ovoid amphora of Dr. 7-11 form (3) a Dr. 38 (or similar) amphora, too concreted to identify details. Amphoras (2) and (3) are both 1st century types, and could have come from the same wreck; both commonly contained fish-sauce. It therefore seems logical to identify (A) a 2nd century BC Graeco-Italic wreck and (B) a 1st century AD Baetican wreck in Tangier Bay, and to discount the statement of Ponsich (1964) that three wrecks were found there in favour of his 1964 map and 1966 text which unequivocally indicate that only two sites were identified.

Ponsich, 1964; 1966; Benoit, 1965a: 84.

**TARANTO A** 1131 Map 10 Italy

40° 16' N. 17° 35' E. (approx.). Near Taranto; detailed location and depth not reported.

Mill-stones. c. AD 400-650 ?

A brief report of discoveries made by P. Throckmorton between Taranto and Porto Cesareo mentions a cargo of Byzantine mill-stones. (The other sites mentioned in the same report are **San Pietro**, **Torre Chianca** and **Torre Sgarrata**).

Ward-Perkins & Throckmorton, 1965.

**TARANTO B** 1132 Map 10 Italy

40° 23' N. 17° 13' E. (approx.). Near Taranto. Depth: approx. 10 m.

Amphoras. c. 300-150 BC (?).

A rather scattered Graeco-Italic amphora wreck in relatively shallow water was surveyed by P. Throckmorton in 1968; no details are available.

Unpublished; site visited by the writer.

**TARANTO C** 1133 Map 10 Italy

40° 22' N. 17° 22' E. (approx.). Near Taranto; on the coast. Depth: shallow.

Amphoras and tiles. 1st century AD.

A line of five lead anchor-stocks, each weighing 590 kg, began a mile offshore and led to a reef near the coast where hundreds of broken roof-tiles and amphoras of Coan and Rhodian type, said to be of the later 1st century AD, were found.

Throckmorton, 1970a: 10 & 28-9; 1987: 78-80.

**TARAVO** 1134 Map 6 France

41° 42' N. 8° 48' E. (approx.). In the bay of Valinco (Corsica); detailed location and depth not reported.

Amphoras. c. 150-25 BC (?).

A wreck called 'Taravo A' with a cargo of Lam. 2 amphoras has been only briefly reported.

Fonquerle, 1972: 62 (locating the site in Ajaccio bay).

Information: W. Bebko.

**TARRAGONA** 1135 Map 4 Spain



41° 6' N. 1° 14' E. (approx.). Near the modern harbour of Tarragona, at Els Carbuncles; at the water's edge. Depth not reported.

Amphoras and pottery. 3rd-1st century BC (?).

A sunken ship yielded amphoras of unstated form, Etrusco-Campanian pottery and a small female terracotta head, according to a brief report.

Balil, 1973-4b.

### **Tarragona (Spain)**

An amphora of Dr. 7-11 form brought up off Tarragona province by a fishing-boat in 1953 may well be from a wreck, but there is no corroborative evidence.

Vilaseca, 1954: pl. II.1.

**TARTUS** 1136 Map 1 Syria

35° 54' N. 35° 53' E. (approx.). Off Tartus; detailed location and depth not reported.

Amphoras. 11th-12th centuries AD.

A briefly reported wreck contained many pear-shaped Byzantine amphoras of Günsenin form 3.

Arthur, 1989b: 88 (citing V.R. Grace).

### **Tartus: another site?**

Only a brief news item has been published of a site off Tartus, said to be a shipwreck with 1,000 amphoras, some stamped, of the 3rd century BC.

Neues Deutschland 1.10.1986.

**TCERNY NOS** 1137 Map 1 Bulgaria

43° 10' N. 27° 59' E. (approx.). Off the headland of Tcerny Nos, near Varna; in shallow water, on a reef 600-1200 m off the cape.

Amphoras. Late 4th or 5th century AD (?).

A group of tall 'spatheia' came from a wreck which has apparently not been completely uncovered. They are of form Riley LR8b.

Toncheva, 1975.

**TEKMEZAR BURNU****1138**

Map 13

Turkey

40° 37' N. 27° 30' E. At Tekmezar Burun, on the NW. tip of Marmara island.  
Depth: 6-8 m.

Roof-tiles. 13th century AD (?).

A large quantity of Byzantine roof-tiles, probably representing a cargo, was found in an INA survey. Some glazed bowls (13th century) found nearby may not be associated.

Pulak, 1985a (site 6); 1985c (site 6).

**Tel Kara (Israel)**

A wrecked cargo of plano-convex copper ingots, found S. of Kefar Gallim, is undated.

Unpublished. Information: E. Galili.

**TENEDOS****1139**

Map 13

Turkey

39° 50' N. 26° 5' E. (approx.). Off the island of Tenedos (Bozcaada); location and depth unknown.

Amphoras. 11th century AD.

A large number of amphoras of form Günsenin 1, confiscated on Tenedos and now in Çanakkale Museum, indicate a wreck there.

Günsenin, 1990: 68.

**TERRACINA****1140**

Map 9

Italy

41° 16' N. 13° 12' E. (approx.). Somewhere in the Terracina area; depth not reported.

Amphoras. c. 150-1 BC (?).

Only a summary reference has been published to a wreck of Dr. 1 amphoras near Terracina.

Gianfrotta, 1989a: 44.

**Terracina: another site (?)**

A bronze horse, hauled up off Terracina, may have formed part of a sunken cargo.

Diolé, 1954.

**TERRASINI A**

1141

Map 11

Italy

38° 9' N. 13° 5' E. Just N. of Terrasini in W. Sicily; less than 150 m from the beach of 'La Ciucca' at Mezza Praia. Depth: 3 m.

Amphoras and copper ingots. c. AD 25-50 (?).

One of two scattered wrecks lying in sand close to the shore was revealed when the construction of a mole caused a change in the currents. The southern site produced some 200 Baetican amphoras of Dr. 8, Dr. 9 and Camulodunum 186A forms, with traces of tituli picti. Copper ingots were also found; four have been published, weighing 42-62 kg, and each inscribed with two numerals which (as in comparable examples) have yet to be satisfactorily interpreted. Almost certainly from the same site came fragments of wood, copper nails, lead sheathing and tegulae; other finds which could derive from this wreck are two swords, a marble bowl, a hand-mill and an axe, embedded in a lump of pitch. Two fragments of Haltern 70 amphoras (Giustolisi, pl. XXXV) can also be attributed to this wreck, but presumably were not cargo, since the main cargo was mostly well preserved (see the illustration published by Papò).

The cargo, and other features, of this shipwreck may be compared with similar Baetican wrecks, such as **Lavezzi A** and **B**, **Port-Vendres A** and **Santo Stefano**; unfortunately the site conditions have not preserved material which could give a precise date.

Papò, 1966b; Purpura, 1974; 1986: 146-8; Giustolisi, 1975.

**TERRASINI B**

1142

Map 11

Italy

38° 9' N. 13° 5' E. Approx. 150 m NE. of wreck A; now overlain by a mole. Depth: 3 m.

Amphoras. c. 310-260 BC (?).

Graeco-Italic amphoras, some whole, and some necks with cork stoppers in place, came from a poorly preserved and recorded site to the NE. of wreck A. One amphora bears the graffito **L.AIMIILIO** in archaic Latin script. Probably to be associated with these are some fragmentary Punic amphoras, cf. Mañá B1 or C1 (Giustolisi, pl. XXIX), and an amphora similar to Mañá B3 (Purpura, fig. 20).

Purpura, 1974; 1986: 146-8; Giustolisi, 1975.

**Terrasini: other finds**

A third wreck, from which came an altar, a Corinthian amphora neck and a louterion base (published by Giustolisi and Purpura, see above), datable to the early 4th century BC, may have existed at Terrasini, according to Kapitän (1979: 101), but there is insufficient evidence to corroborate this idea.

**TERRAUZZA**

1143

Map 11

Italy

37° 0' N. 15° 19' E. Near Terrauzza, S. of Syracuse (Sicily); close to rocks awash, 150 m from shore. Depth: 4 m.

Amphoras. c. AD 200.

A badly-smashed cargo of amphoras lies in heaps on a rocky bottom. The amphoras, of forms Kapitän 1 and 2, are datable to the end of the 2nd or the beginning of the 3rd century AD. A glass bottle and some unidentifiable table pottery were found in the initial survey.

Parker & Squire, 1974.

### **Terrauzza: tile wreck**

What is probably the wreck of a cargo of post-medieval roof-tiles lies on the shoreline approx. 250 m SW. of the Roman wreck.

Information: G. Kapitän.

**TEULADA** 1144 Map 6 Italy

38° 50' N. 8° 40' E. (approx.). In Teulada bay (S. Sardinia); detailed location and depth not reported.

Amphoras (?). c. 600-300 BC ?

A 'proto-Punic' wreck has been summarily reported. See also under **Sardinia**.

Zara, 1984.

**THALASSINIES SPILIES** 1145 Map 1 Cyprus

34 52' N. 32 19' E. On the W. coast of Cyprus, scattered on reefs in an exposed situation. Depth: shallow.

Amphoras. 6th-7th centuries AD.

Amphoras of more than one date were found among very fragmented material, and could represent three ancient wrecks, according to the first report; the fuller report does not support this, but includes a group of Byzantine globular amphoras which must be part of a wrecked cargo.

Giangrande & Richards, 1985: 161; Giangrande et al., 1987: 191 & 202.

**THASOS A** 1146 Map 13 Greece

40° 46' N. 24° 42' E. Below a headland E. of the harbour of Thasos; 20 m from shore. Depth: shallow.

Amphoras. 5th-6th centuries AD (?).

Late Roman or Byzantine amphora fragments lying close to the land probably represent at least one wreck.

Bouzek, 1982: 136.

**THASOS B** 1147 Map 13 Greece

40° 46' N. 24° 42' E. (approx.). Detailed location and depth not reported.

Amphoras. 1st century BC (?).

A wreck of Lam. 2 amphoras at Thasos has been summarily reported.

Tchernia, 1986: 72.

Thau, Étang de: see **Agde D.**

**TIBOULEN DE MAÏRE** 1148 Map 5 France

43° 12' N. 5° 19' E. At Tiboulen-de-Maïre island, 10 km S. of Marseilles. Depth: 50-54 m.

Amphoras. c. AD 100.

The wreck was discovered in 1976, unlooted, but damaged by trawls. A cargo of Dr. 20 amphoras (some stamped **P.VA.FAV**) included, together with Baetican Dr. 28, Dr. 14, Beltrán 2A and 2B amphoras and Tarraconensian Dr. 2-4 amphoras, some pear-shaped amphoras from Gaul (Laubenheimer G4). The ship must have called at a port in W. Gallia Narbonensis en route from Spain. Some shipboard coarse pottery was found, and also remains of the hull, including a copper keel bolt.

Colls *et al.*, 1977: 47; Lequément, 1985: 112; DRASM, 1983: nos 81, 87 & 93; Amar & Liou, 1984: no. 185; Pomey *et al.*, 1989: 15.

**TITAN, LE** 1149 Map 5 France

43° 2' N. 6° 31' E. Off the E. tip of île du Levant (Hyères); by the Esquillades reef, E. of Le Titan lighthouse. Depth: 27-29 m.

Amphoras. c. 50-45 BC.

A beautifully-preserved tumulus wreck was extensively looted prior to its complete excavation by P. Tailliez in 1957. The cargo, in two layers only (it seems) was of Baetican amphoras, mostly form Dr. 12, with some ovoid amphoras of form Dr. 7-11. Some 700 amphoras were excavated, and the looters had previously got some 500-1,000. The Dr. 12 amphoras were closed (according to one account) by a bung of cork, and with a terracotta stopper. They contained pieces of tunny-fish (scales, bones, even heads and tails) and shell-fish shells; some amphoras smelled of olive-oil, according to the divers, so the fish may have been packed in oil, like some modern tunny. Some amphoras from the site con-

tained almonds.

Shipboard items included a Dr. 1B amphora, two lamps, a large bronze dish, a bronze ladle and a spoon, besides cooking-jars, jugs and bowls. Two wooden plates were found. There was a selection of fine-ware cups and plates, all black-gloss, Camp. B - at the time of the wreck, the red-gloss ware of Arretium had not yet reached this ship's suppliers. Two coins were found, both semi-uncial bronzes, and thus likewise pre-Augustan. Other domestic items were a mill-stone, a whetstone, two small tablets of stone (like oculist's stamps), and also some fish-hooks, attached to a tangled ball of line, encased in concretion. Mutton bones were also found, and a human vertebra.

Only the bottom of the hull was preserved. The ship was very flat-bottomed, at any rate amidships; the first three strakes (at least) were reinforced by external planking (all fastened with treenailed mortice-and-tenon joints, treenails and copper nails). At one point, the hull had been repaired by adding an extra piece between two frames. The hull was not lead-sheathed, apparently. Some lead tubing was found, and so, too, were six wooden discs, which might have formed part of a pump. An unspecified number of anchors (presumably lead stocks) were found at the site after the excavation was over. The ship cannot have been large - the preserved cargo would weigh at most 120 tons, by the present writer's reckoning, though the tumulus of amphoras at first covered an area 30 x 12 m. This can, therefore, be cited as an example of a small, coasting ship used in long-distance trade, for the cargo originated in southern Spain.

The excavator closes his report with some comments on the excavation, emphasizing the importance of archaeological direction, teamwork, and site planning. With the benefit of hindsight, one may say that the gaps in our understanding left by this excavation lie less in the field operations than in the post-excavation study and publication, both of the finds and of the remains of the ship's hull. Nonetheless, in many ways this 'amateur' excavation was more successful than some others described in this catalogue which were directed by professional archaeologists.

Tailliez, 1965; 1967: 114-57; Benoit, 1956 (esp. fig. 1. 11-14, better drawings than those in the 1965 publication); Benoit, 1958.

Tobruk: see **Ain el Gazala**.

Tolón: see **Návlion**.

#### **TORO, EL**

1150

Map 3

Spain

39° 27' N. 2° 28' E. Near Isla del Toro (SW. Majorca); detailed location and depth not reported.

Amphoras.

c. AD 1-50.

A group of Baetican amphoras, cf. Dr. 9, represents a wreck in SW. Majorca. One amphora is stamped **QF** on the shoulder. The date is based on the published amphora profiles.

Mascaró, 1962 & 1971 (photos of material); Cerdá, 1971 (drawing of four amphoras).

A Dr. 2-4 amphora in Saragossa Museum is labelled 'Palma de Mallorca'; this may be the origin of the wreck marked by Beltrán (1970: fig. 149) at Isla del Toro, though he gives no information to corroborate the existence of the supposed wreck (cf. Beltran, p. 375).

**TORRE CASTELLUCIA A & B**                      1151-1152                      Map 10                      Italy

40° 20' N. 17° 23' E. Near Pulsano, SE. of Taranto; close to the water's edge.  
Depth: -2 m.

No cargo.    Possibly 3rd century AD.

Two hulls, 35-40 m apart, were freed of sand by a storm in 1972, and subsequently concealed again. They were certainly long ships; one measured 2.4 m wide, and 17 m long, excluding the bow, which was missing. They were probably warships, though no details of any equipment have been reported; 3rd century AD pottery was found at the site, and in any case all the reports regard the ships as probably Roman. A short survey by the CSAS in October 1972 has been published only in summary.

Lamboglia, 1972b: 449; Lo Porto, 1973: 373; Ferrandi, 1980.

**TORRE CHIANCA**                                      1153                                      Map 10                                      Italy

40° 16' N. 17° 53' E. Off Torre (1a) Chianca, near Porto Cesareo (Apulia); on a sandy bottom, 100 m SE. of the tower. Depth: 6 m.

Marble columns.                                      Mid 3rd century AD (?).

A cargo (or the remains of one) of five columns and some amphoras was located by P. Throckmorton in 1964. The columns were 8-9 m long, of cipollino from Carystos in Euboea. Beneath the columns was found a lead seal marked with a Greek monogram and a star. The amphoras are derived from Dr. 43 (cf. Palma & Panella, 1968, figs 458-9).

Unpublished.

Information: P. Throckmorton.

**TORRE DELL'ORSO**                                      1154                                      Map 10                                      Italy

40° 16' N. 18° 26' E. On a reef at Torre dell'Orso, N. of Otranto (Apulia).  
Depth: 9-10 m.

Amphoras.    3rd-4th centuries AD.

A summary report describes the cargo of this wreck as amphoras of form Dr. 41 or 42, presumably Afr. 2 or cylindrical amphoras.

Gandolfi, 1982: 413.

**TORRE DELL'OVO** 1155 Map 10 Italy

40° 18' N. 17° 30' E. Near Campomarino (Apulia). Depth: 8-10 m.

Amphoras. c. 425-375 BC.

The site is known only from material raised by H. Schlüger, who did not give a detailed location. The finds are Corinthian A amphoras and 'fragments of some other Greek jars', apparently datable around the early years of the 4th century BC.

Kapitän, 1973a: 186; Koehler, 1979a: 29.

**TORRE DERRIBADA** 1156 Map 2 Spain

37° 52' N. 0° 44' W. Near Puerto de San Pedro del Pinatar - presumably near the 'Torre de la Horadada' marked on charts; exact location and depth not reported.

Amphoras. 2nd century BC (?).

A cargo of 'transitional Graeco-Italic' amphoras has been summarily reported.

Más, 1985a: 162.

**TORRE FLAVIA A** 1157 Map 9 Italy

41° 57' N. 12° 2' E. NW. of Ladispoli; near an old watchtower which has now been cut off by the sea. Depth: 5 m (?).

Marble columns. Presumably Roman period.

A cargo of marble columns is known to lie a few hundred metres N. of the tower; the wreck has yielded wood, copper nails and lead rings. From nearer the tower (according to unconfirmed reports) in the past were found three statues, two of marble and one of bronze, and some marble blocks; since a Roman villa, now partly submerged, existed nearby, it is not certain that these finds belong to the wreck.

Gianfrotta, 1981c: 72.

**TORRE FLAVIA B** 1158 Map 9 Italy

41° 55' N. 12° 0' E. From somewhere off Torre Flavia, NW. of Ladispoli. Depth: 25 m.

Amphoras. Date unknown.

A newspaper report states that an amphora cargo and remains of a hull were found off Torre Flavia.



Gianfrotta, 1981c: 88, note 18.

**TORRE GUACETO**

**1159**

Map 10

Italy

40° 42' N. 17° 47' E. In Torre Guaceto bay (Brindisi); on a rocky bottom. Depth: 3-10 m.

Amphoras. 1st century BC (?).

A wreck comprising a considerable number of Lam. 2 amphoras (Dr. 6, according to Sciarra), broken and widely scattered, has been briefly reported.

Kapitán, 1972c: 200; Sciarra, 1985: 145.

**Torre Hidalgo (Italy)**

An undated wooden hull, found in 1978 near Punta Ala (Tuscany), may well not be ancient.

Martelli et al., 1982: 46-7.

**TORRE LA SAL**

**1160**

Map 1

Spain

40° 9' N. 0° 2' E. Near Cabanes (Castellón de la Plana); widely scattered on a calcareous rock bottom. Depth: 7-9 m.

Amphoras. c. 130-110 BC (?).

A great variety of finds (including anchor-stocks as well as anchors) are spread over an area 625 x 700 m. The power of the waves is shown by two joining pieces of an amphora which were found 200 m apart. Pace Wagner, this cannot be a single scattered wreck, but must include other material; however, within the wider spread A. Fernández has been able to distinguish a wreck cargo. This consists of some 20 Dr. 1A amphoras, all full of resin (conifer resin of no specific origin) and stopped with a roll of vegetable fibres, sealed in place with mortar. The amphoras (which resemble those of **Cap Bénat D**) were found in a group, resting in hollows in the seabed. 100 m away were some Dr. 1C amphoras and a Lam. 2, which might belong; some distance away is a ballast mound, not yet investigated. No remains of any ship have been found.

Wagner, 1978; Fernández, 1983: 158-65; 1989; Guerrero, 1986: 151, note 18.

**Torre Rossa (Italy)**

W. of **Acque Chiare**, and not far from (eg.) **Punta Penne**, a homogeneous wreck of Apulian amphoras, stamped, was seen in 4-5 m depth by G. Kapitán. This may be the same as **Punta Penne A**.

Information: G. Kapitán.

**TORRE SAN GENNARO**    1161    Map 10    Italy

40° 32' 18° 3' E. SE. of Brindisi; 300 m from the coast. Depth: 15-16 m.

Amphoras.    12th century AD (?).

Five amphoras, probably of S. Italian manufacture, were raised from a site which must surely have been a wreck.

Sciarra, 1973: 346-7 & fig. 5 a-e; Arthur, 1989b: 88.

Torre San Giovanni: see **Secche di Ugento C.**

**TORRE SANTA SABINA**    1162    Map 10    Italy

40° 45' N. 17° 42' E. In the natural harbour of Santa Sabina (Apulia); S. of the Tower. Depth: 5-6 m.

Amphoras and pottery ?    Late 1st century BC-early 1st century AD (?).

Exploration of an area in the harbour, E. of a reef which lies in its middle, suggested to G. Kapitän a Roman wreck cargo of pottery and Dr. 2-4 amphoras; in a note published by the present writer in 1974, this was dated to the Augustan period. Subsequently, reports by N. Lamboglia and A. Freschi indicate that the harbour contains a good deal of rubbish deposits dating from the 7th century BC to the 1st century AD, and the pottery seen by Kapitän belongs with these. However, near the entrance of the bay, Lamboglia found a ship's keel and some planking, preserved to a length of 3½ m, which had no clearly associated dating material. The full report of continued work by A. Freschi and others may clarify this site.

Parker, 1974a; Lamboglia, 1974; 165-7; Sciarra, 1985: 144.

Information: A. Freschi.

**TORRE SGARRATA**    1163    Map 10    Italy

40° 19' N. 17° 24' E. Near Torre Sgarrata (Torre Sassoli), SE. of Taranto; 450 m SW. of the Tower. Depth: 11 m.

Marble sarcophagi, etc.    c. AD 180-205.

A cargo of 18 roughed-out sarcophagi and 23 large blocks, together with quantities of marble veneer, lay in a relatively undisturbed state. The original weight was at least 160 tons; the ship's gross tonnage would have been some 250 tons. The blocks include yellow onyx (alabaster) from Asia Minor; the white marble blocks and sarcophagi came, according to recent analysis, from Thasos.

The site was completely excavated. Shipboard items included Tripolitanian and other amphoras, Çandarlı and other pottery of 2nd-3rd century types, some tile fragments, a mason's mallet, several counters or abacus beads, two glass vessel fragments, some animal bones, a cuirass buckle, and several coins; one of these last is a bronze of Commodus (AD 180-192), minted on Lesbos, which gives

the date for the wreck.

The ship, whose overall length is estimated at 30 m or more, had been repaired with a patch; that she was old when she sank is suggested by this, and by a C<sub>14</sub> date for the hull of 77 bc±43 (P-1436). The planking was of Aleppo pine; the spaces between the frames and the planking were packed with twigs of tamarisk; elm was used for a large, carved block which was apparently the step for the foremast.

Throckmorton, 1969a; Lawn, 1970: 585; Booth, 1984.

Information: S. Walker; K.J. Matthews.

**TORRE TESTA** **1164** Map 10 Italy

40° 41' N. 17° 52' E. Near Giancola, NW. of Brindisi. Depth: shallow.

No cargo. Date unknown.

A few metres from the water's edge, the remains of a large ship were found; the frames were exposed, with, among them, a lava mill-stone, 1.1 m in diameter. Two other mill-stones were also found at the site.

Sciarra, 1982: 125 (sv. 'Brindisi'); 1985: 145.

**TORRE VALDALIGA** **1165** Map 7 Italy

42° 8' N. 11° 44' E. N. of Civitavecchia, between Torre Valdaliga and Sant'Agostino. Depth: 8-10 m.

Amphoras. c. AD 1-20.

A wreck with amphoras of forms Dr. 2-4 and Dr. 7-11 has been briefly reported. Finds include Arretine pottery and a lead anchor-stock.

Gianfrotta, 1982: 25.

### **Torrequebrada (Spain)**

A statue of Bacchus raised near Torremolinos came from a 19th or 20th century wooden wreck.

Vidal, 1961.

### **Torroella (Spain)**

Dr. 1 amphoras, one or more of them stamped **SES**, have been found in what appears to be a mixed site, probably not a shipwreck.

CRIS, 2. 20 (1960): 23; Gianfrotta & Pomey, 1981: 156.

**TOULON A & B****1166-1167**

Map 5

France

43° 7' N. 5° 56' E. Found in rescue excavations at Toulon.

Stone.

1st century AD.

Two small Roman boats, containing large stone blocks thought to be cargo, were discovered in a 1st century AD context beside the ancient quay at Toulon. Both boats had a flat bottom and a transom at one end, apparently the bow; blunt bows of this form were common in small boats of the Roman period (Casson, 1971: 331).

Illsley, 1987; Dutrait, 1987.

Information: J.S. Illsley.

**TOUR D'AGNELLO****1168**

Map 6

France

43° 1' N. 9° 26' E. Near Macinaggio, close to Cap Corse (Corsica). Depth: 42 m.

Amphoras.

c. 300-275 BC (?).

A well-preserved cargo of Graeco-Italic amphoras was declared in 1979. The amphoras are assigned to her type D by Will, on the basis of preliminary information; a date 'fairly early in the 3rd century' is, however, suggested by Liou, basing his opinion not only on the amphoras but also on a Camp. A plate of form Lamboglia 36 found at the site. The drawings of the amphoras published by Liou show amphoras which seem to meet the criteria of Will's type A2 rather than type D, which confirms an earlier date. Another find from the site is a basalt mill-stone; some of the hull is also preserved.

Will, 1982: 352; Liou, 1982: 452-4; DRASM, 1983: nos 172-5; 1985: 47.

**TOUR DU CASTELLAS****1169**

Map 4

France

43° 19' N. 3° 34' E. 300 m off-shore at La Tour du Castellias, near Marseillan-Plage. Depth: 6 m.

Amphoras.

Late 4th-early 3rd century BC (?).

A wreck in shallow water had a cargo of Graeco-Italic amphoras of two varieties; no illustration has been published, but the amphoras were certainly early, perhaps even 4th century BC. The amphoras lay at one end of an area of dark sediment, some 20 x 7 m in extent, which included many bronze nails and must represent the decayed remains of the ship. One of the amphora necks preserved a cork stopper and a lime sealing. Other finds comprised an anchor-stock (together with part of the shank) of a very thin lead covering on a wooden core, a lead pot, and a wooden ring. At one end of the site were also found the rubber and lower stone of a saddle-quern, and a bronze tripod, decorated with horses and a winged goddess, of Etruscan origin and datable at the end of the 6th or in the first 20 years of the 5th century BC. The site is overlain by remains of a 17th century AD wreck, and it may well be that an archaic ship came to grief at the same spot as the early Republican amphora-carrier; however, in

view of the absence of any Etruscan pottery from the site it seems better to view the tripod either as a 'stray' or as an antique being carried aboard the 4th/3rd century ship.

Fonquerle, 1986b.

**TOUR FONDUE, LA** **1170** Map 5 France

43° 1' N. 6° 9' E. Off the Giens peninsula, 300 m SSE. of la Tour Fondue. Depth: 18-20 m.

Amphoras. c. 300-250 BC (?).

A wreck with a cargo of Massiliot and Graeco-Italic amphoras was deeply buried below sea-grass. Unfortunately, the site was looted before officially authorized excavations could take place. The Graeco-Italic amphoras were in the majority; the Massiliot amphoras (about 40%) were all stamped **AP** (in ligature). A third type of amphora, of which two were found, was perhaps a half-size Graeco-Italic. Limited sondages revealed only one shipboard pot (part of an oinochoe) and an iron gad or wedge. There were two anchors on board when the ship sank, both with a lead stock of rather distinctive type; an iron fluke-tip was also found. The ship's hull survived; she was lightly built, with tenons set close together in deeply-cut mortices.

Joncheray, 1976d (naming the site 'Giens'); 1989b (naming the site 'La Tour-Fondue').

**TOUR SAINTE MARIE A** **1171** Map 6 France

43° 0' N. 9° 29' E. Off Cap Corse (Corsica); between Giraglia island and Tour Sainte Marie, 2 km from the coast. Depth: 55 m.

Amphoras. c. AD 30-55.

A tumulus of Baetican amphoras, discovered in 1967, was rapidly excavated by G. Drago to forestall looting. There must have been 2,000 amphoras on the site at first; 565 were excavated, of five types, belonging to forms Dr. 7-11, Dr. 12, Beltrán 2A, and Haltern 70. All the amphoras share similarities of technique; some are stamped (wth simple stamps such as **M**, **X**, **MR** or **CEP**), and two of the stamps appear on amphoras of more than one type. Within each type there is considerable variation of size and body-profile, as one would expect with Baetican amphoras of this period. By comparison with other wrecks (eg. **Port-Vendres B**) one may note the absence of Dr. 20 oil amphoras. At Tour Sainte Marie, many of the amphoras were stopped with a terracotta stopper, sealed with mortar, but no trace of any contents has been reported.

Other finds included a mortarium, a tile fragment, and part of a schist flagstone. No fine pottery or coins, and no remains of the ship, are reported from the excavation, which left the lower part of the cargo still buried.

Tchernia, 1969: 496-9; 1971b: fig. 5.

**TOUR SAINTE MARIE B** **1172** Map 6 France

43° 1' N. 9° 30' E. Near wreck A. Depth: 70-80 m.

Amphoras. 2nd century BC (?).

A second wreck off Tour Sainte Marie, with amphoras of unknown form, a lion-spout guttus and a Campanian cup (netted by a fisherman), is mentioned by Bebko. Superficially this might be taken for **Tour d'Agnello**, but the difference of depth and date, and the absence of reference back by Liou (1982), imply a distinct site.

Bebko, 1971: 2.

Tourelle aux Moines, La: see **Saint Honorat**.

**TOURS** 1173 Map 15 France

47° 23' N. 0° 42' E. In the R. Loire at Pont Napoleon, Tours.

Pottery. Roman Imperial period.

Several Gallo-Roman vases found by a dredger 'apparently' come from a wreck.

Kisch, 1978: 280.

**TRADELIÈRE, LA** 1174 Map 5 France

43° 30' N. 7° 4' E. Approx. 300 m S. of La Tradelière islet, E. of Île Sainte-Marguerite (near Cannes). Depth: 47-50 m.

Amphoras, glass, pottery, etc. c. 20-10 BC.

The wreck was well preserved when it was discovered; a tumulus of amphoras stood proud of a slightly sloping, muddy bottom, close to a popular diving site off the E. tip of Île Sainte Marguerite. Before excavation by P. Fiori took place in 1973, the top two layers of amphoras were removed. These comprised Rhodian and Chian amphoras, Dr. 2-4 amphoras of Italian type (probably from the Adriatic side of Italy, though said by some to be Coan), Dr. 1B amphoras (of which only one survives) and Dr. 6 amphoras (some of a type transitional from Lam. 2). The Dr. 2-4 amphoras (of which one at least had a painted inscription on the neck) were stopped with corks; stoppers of mortar or terracotta were also found, but it is not clear to which amphoras they belonged. The Dr. 2-4 amphoras, of three varieties, made up about 50% of the amphoras on board; some contained the remains of dates (not many - only 50 were counted), and one sage (possibly the residue of sage vinegar).

Remnants of the amphora cargo were recovered from the lower level of the looted site, together with tens of thousands of hazelnuts (which formed a layer up to 1 m thick), four amphoras of form Kingsholm 117 (one containing dates), an ovoid amphora which contained cerusite, part of a Dr. 9 fish-sauce amphora, and some flat-bottomed jars. Altogether, the amphoras are reckoned to have numbered 300-400, and to have taken up about two-thirds of the cargo space. The hazelnuts, probably packed in sacks, separated the amphoras from the rest of the

cargo space, which was taken up partly by pottery. This included 'Pompeian Red' plates in two sizes, some rimless platters, fine-wall goblets (of eight sizes, nested) and two-handled and four-handled cups. Some smaller amphoras and an antelope-headed guttus were perhaps for shipboard use. The cargo also included glass cups, stacked in piles; they must have had straw or other packing between them originally, but none survives. Some pieces of wood found among the fine-wall ware and the glass appear to have belonged to packing-cases. Of six different colours, the glass vessels were small, ribbed bowls and plain bowls with concave bases (cf. Price, 1985: 291). There is some repetition of colour in each form; there is a tendency towards a common diameter, but with enough outliers from the distribution to show there was no mechanical means of obtaining uniformity of size.

The ship's hull was of normal construction, with a single layer of planking and a lead sheathing; some discs and a bearing from the pump, and a sheave from a rigging block, were found. The heterogeneous nature of the cargo makes it desirable that as much information as possible should be reported about the site (since only preliminary accounts have appeared). The dates must have been grown in the southern part of the Mediterranean region, but the 'Pompeian Red' ware and the glass are probably Italian; the fine-wall ware could also be from Italy, though a source in Greece or Asia Minor seems possible, too. At least one can say that this kind of cargo is unusual in the W. Mediterranean.

Fiori, 1972b: 115; 1974a; 1976; Liou, 1973: 603-4; 1975: 601-3; Joncheray, 1976e; Fiori & Joncheray, 1975; Carrazé, 1976a: 69-70; Hesnard, 1977: 163; Hesnard *et al.*, 1977: 186 (cf. same vol., p. 293); Lequément, 1985: 113; Pollino, 1983: 43-5; Carre, 1983: 18; Carre & Jézégou, 1984: 134; DRASM, 1985: 60-2; Pollino, 1986; Hesnard *et al.* 1988: 55-6; Cipriano & Carre, 1989: 84; Pomey *et al.*, 1989: 48-9; Feugère & Leyge, 1989.

**TRAPANI** 1175 Map 11 Italy

38° 2' N. 12° 28' E. (approx.). At an unknown location off Trapani (Sicily).

Amphoras. 3rd century AD.

Two amphoras of Mauretanian type (Panella 33), brought up by fishermen off Trapani, probably represent a wreck.

Purpura, 1986: 148-50, no. 58.

### **Tre Fontane (Italy)**

Near Mazara del Vallo (W. Sicily), the remains of a number of wrecked ships and their cargoes have been found in shallow water close to the beach; only a summary report has been published.

Purpura, 1986: 153, nos 91-2.

**TRE SENGHE** 1176 Map 1 Italy

42° 6' N. 15° 29' E. The wreck of 'Tre Senghe (A)' (or 'Tre Scoglie'), at Punta del Diavolo, San Domino, Tremiti islands; 60 m from the rocks at the S. point of

San Domino. (Cf. **Punta del Diavolo**, a medieval wreck at the same place).  
Depth: 24-25 m.

Amphoras. c. 25 BC.

A wreck with a cargo of Lam. 2 and other amphoras has recently been partly excavated. The site has long been known to divers, and by 1970 could be described as 'robbed in recent years' (Ruegg, 1971). Nonetheless, excavations by A. Freschi in 1980-2 showed that much of the cargo, firmly encased in concretion, in fact remained; altogether 187 amphoras have been raised. Over 150 are of form Lam. 2, of two varieties, both of a type transitional to form Dr. 6. One is stamped **M.FVS**, another **DASMI**; all were pitched inside, and one, which retained its terracotta stopper, still contained a deposit left by decomposed wine. The amphoras were stowed in three layers, without any packing. Also part of the cargo were seven small amphoras of form similar to Lam. 2 (but of different clay) and eleven flat-bottomed amphoras, one of which (probably) had a stopper inscribed **H ROMILI**. These smaller amphoras (of which both forms were pitched) are thought to have contained special-quality wine.

Shipboard items included two sherds of black-gloss pottery, an unglazed guttus, a lagynos with decorated handle, some red-gloss ware (including the stamped base of a patera) and fragments of a cup signed by the Po Valley potter L. Sarius L. l. Surus, giving a date between 30 and 20 BC (cf. Carre, 1985: 211). There were a few fragments of shipboard amphoras (Dr. 6 and Dr. 2-4), and various jugs, bowls, pots, etc. Amidships and towards the stern were found two bronze bushes with the remains of a wooden axle (from a windlass?), part of a pulley block, a lead sound, a roll of lead sheet, and an axe (?); also a short sword (?) of iron and bronze.

The hull of the ship, lying on one side, is well-preserved. The shell was single-planked, sheathed with lead, and pitched both outside and in; the strakes are fastened to the frames by treenails and by nails which do not emerge from the frames. A piece of lead pipe and a copper box were found in what was the port quarter of the ship, indicating that this was the location of the pump. The ship is thought to have been 20-24 m long and 5 m beam, with a lading of 900 amphoras weighing 45 tons (Volpe) or 100 tons (Freschi).

Ruegg, 1971: site no. 4; Parker, 1973b: 375 & figs 31-2; Freschi, 1982; 1983; Volpe, 1989; Cipriano & Carre, 1989: 83.

Tremiti islands: see **Punta del Diavolo**, **Punta del Vapore**, and **Tre Senghe**.

**TRISCINA A** 1177 Map 11 Italy

37° 34' N. 12° 48' E. Off Triscina (W. Sicily); on a reef, 200-300 m from the coast. Depth: 3 m.

Amphoras. c. 200-150 BC (?).

A scattered wreck of Graeco-Italic amphoras lies concreted to rocks off-shore. The amphoras appear to belong to Will type D (and, possibly, E).

Purpura, 1975: 64-6; 1986: 154, no. 96; Will, 1982: 352-3.



**TRISCINA B****1178**

Map 11

Italy

37° 34' N. 12° 47' E. Three km W. of wreck A; a widely-spread wreck on a sandy beach site. The locality is named 'La Tonnara' - this name not used here to avoid possible confusion. Depth: 3 m.

Amphoras. c. 150-130 BC (?).

A cargo of amphoras transitional from Graeco-Italic to Dr. 1, together with Dr. 1A amphoras (similar to **Grand-Congloué A**) and Lam. 2 amphoras of two (or more) varieties. It is not certain whether some Punic amphoras also belong; other material from the site (of only presumed association) includes a small, thick bowl and some minerals (probably the basis for pigments). One of the Transitional amphoras is stamped **PA** on a handle. Evidently originally a large ship, the wreck appears to have been caused by an off-shore reef which at present rises to 3 m below the surface.

Purpura, 1975: 66-76; 1986: 153-4, no.94.

**TRISCINA C****1179**

Map 11

Italy

37° 34' N. 12° 47' E. In the same area as wreck B; widely-spread and covered by sand. Depth: 3 m.

Amphoras. 5th century AD (?).

A number of 'spatheia' and cylindrical amphoras probably represent a late Roman wreck.

Purpura, 1975, fig. 17; 1986: 154, no. 95.

**TRISCINA D****1180**

Map 11

Italy

37° 34' N. 12° 47' E. Detailed location and depth not reported.

Amphoras and barrels (?). c. AD 25-125 (?).

A wreck of the 1st century AD has produced Beltrán 2B amphoras and iron hoops. It is not certain if the hoops are from casks or from some other kind of stave-built vessel, but in this case there is no doubt of their form (cf. **Port-Vendres C**).

Purpura, 1991: 139-41.

**TSIKHISDZIRI****1181**

Map 1

Georgia

41° 40' N. 41° 30' E. (approx.). Material brought up by fishermen between Kobuleti and Tskhisdziri; depth not reported.

Amphoras. Classical/Hellenistic period (?).

A fishing haul included intact Sinopean, Samian, Chersonesian and Rhodian amphoras, presumably from a wrecked cargo. The date is uncertain.

Gamkrelidze, 1992.

**TUNA, SA** 1182 Map 4 Spain

41° 57' N. 3° 13' E. (approx.). Near Bagur; exact location and depth not reported.

Amphoras. 2nd century AD.

A wreck of Beltrán 2B amphoras has been briefly reported from Sa Tuna; the amphora illustrated is probably 2nd century AD, though no other finds have been published.

Pascual, 1963: 7, no. 6.

**TURKEY** 1183 Map 13 Turkey

36° 55' N. 27° 20' E. (approx.). Location and depth not reported.

Amphoras. 3rd century AD (?).

A wreck of amphoras 'of two well known types, one from the nearby Greek island of Kos and the other from Rome; the wreck has been dated to the 3rd century AD'. Perhaps the amphoras were of forms Kapitän 1 and 2.

Frey, 1982: 4.

**TYRE A** 1184 Map 14 Lebanon

33° 15' N. 35° 10' E. (approx.). Near Tyre; location and depth not reported.

Works of art. 4th-3rd centuries BC (?).

At least six bronze statues are said to have been raised by looters from a Phoenician wreck near Tyre.

Marx, 1974.

**TYRE B** 1185 Map 14 Lebanon

33° 15' N. 35° 10' E. On the S. side of Tyre. Depth: shallow.

Amphoras. 1st century AD (?).

A wreck with amphoras said to be of the 1st century AD has been substantially looted near Tyre.

Marx, 1974.

**TYRE C, D, E & F**                      **1186-1189**                      Map 14                      Lebanon

33° 15' N. 35° 10' E. On the S. side of Tyre. Depth: shallow.

Cargoes not reported.

C. Roman Imperial.

D. Phoenician (4th century BC ?).

E. Hellenistic (3rd century BC).

F. Hellenistic (2nd century BC).

Only summary reports have been published of several looted wrecks near Tyre.

Marx, 1974.

**TYRE G**                                      **1190**                                      Map 14                                      Lebanon

33° 15' N. 35° 10' E. On the S. side of the peninsula of Tyre. Depth not reported.

Figurines, etc.                                      5th century BC (?).

A wreck, buried in sand, has pieces of timber and lead sheathing preserved, together with an amphora (of unusual shape) and at least seven terracotta figurines, 12-38 cm high. These show a goddess with her right hand raised in blessing and her left either over her breast or holding a baby; on the base is a 'sign of Tanit'. Another terracotta which is thought to come from the same site is a group model of a priest, four votaresses and a goddess, gathered round an oven for a cake-baking ceremony.

Although the Tyre shipwreck is, unfortunately, only imperfectly known, it is important as establishing that Phoenicio-Punic figurines were in fact transported by ship, and that the scattered site at **Shavé Ziyyon** is, therefore, most likely a shipwreck, rather than a votive deposit 'reburied' at sea, as has been suggested.

A date in the Hellenistic rather than the Persian period is possible, but the date given here is that of the initial publication.

Marx, 1974; Culican, 1976.

**TYRE H**                                      **1191**                                      Map 14                                      Lebanon

33° 16' N. 35° 12' E. (approx.). To the N. of Tyre; detailed location and depth not reported.

Pottery and grinding-stones.                      Byzantine period.

A Byzantine wreck, containing glazed pottery and mill-stones, has been briefly reported.

Marx, 1974.

**ULLASTRES, LOS**

**1192**

Map 4

Spain

41° 53' N. 3° 12' E. Off Cabo San Sebastian, Calella; on a soft bottom, 200-300 m S. of Los Ullastres reef. Depth: 52 m.

Amphoras. c. 50 BC-AD 25.

When discovered, the cargo of Pascual 1 amphoras formed a compact group, protruding from the seabed sediment. The amphoras are generally similar, though three main varieties can be discerned; several retained cork stoppers, and one contained liquid with a reddish sediment. A number of them are stamped, with a single-letter stamp on rim or foot. At one point there were four layers of amphoras, with an iron anchor lying on top; in general the layers of amphoras were in distinct layers, not intercalated. The ship's planking is said to be of fir, the frames were of elm and beech, and pine and evergreen oak were used for components of the pump. Lead pipes were found, overlying cargo amphoras. The hull is estimated to have been 18 m long. No pottery or other dating material has been reported from the site.

Foerster, 1970; 1974a; 1976; 1977; 1978b; 1979; 1980b; 1984.

**ULU BURUN**

**1193**

Map 1

Turkey

36° 8' N. 29° 41' E. At the headland of Ulu Burun (Akroterion), 8 km SE. of Kaş; close to the rocky coast. Depth: 43-52 m.

Copper and tin ingots, weapons, amphoras and other cargo.  
c. 1325 BC (?).

A substantial Bronze Age wreck, extending over an area at least 10 x 8 m, was discovered in 1982 and is being excavated by G.F. Bass and C. Pulak. About 200 four-handled copper ingots, amounting to some 6 tons of copper, were stacked in rows. Some ingots had been made with only two handles; there were also bun-shaped ingots of both copper and tin, and some four-handled ingots (mostly broken or cut) of tin. Ingots of all types bear incised marks. There were seven large pithoi of Canaanite type, and over 100 Canaanite amphoras, in which were found olive pits, glass beads, orpiment (yellow arsenic) and what was originally as much as a ton of 'Chios turpentine', derived from the terebinth tree, Pistacia atlantica Desf. The amphoras had been stopped with dried figs, and contained in their bottom a residue from previous use, consisting of terebinth and mastic resin, large sherds used as stoppers, and fruits or other remains of Pistacia, sumac, Adonis, fig and grape. There were stacks of Cypriote pottery, much of it originally packed in a pithos, and lamps of Syro-Palestinian type. Tools, daggers, spears and swords, together with beads of amber, faience, glass and crystal, 21 blue glass ingots, African blackwood logs, tortoise and ostrich shells, Murex shell opercula, elephant and hippo ivory, seal blanks and

scrap gold and silver, probably all belonged to the ship's cargo or stock-in-trade. The cargo was stowed on dunnage of Thorny Burnet (Sarcopoterium spinosum). Other organic material from samples (many still to be fully studied) includes leaves, seeds, remains of rope, red and blue animal hairs, bones of sheep or goat and of a small rodent, fish bones, phytoliths, pollen and a (human) coprolite.

On board there were numerous bronze, stone and haematite weights, of two types. There were also a Mycenaean seal and several cylinder-seals and scarabs. Miscellaneous items included pendants of Canaanite type, a stone mace-head, two finger-cymbals, five animal-head drinking-horns of faience and a gold chalice. The chalice's parallels are from the Late Minoan I and Late Helladic I-II periods (mid 16th-end 15th centuries BC), and so it is earlier than the other Mycenaean material from the wreck. A fragmentary sword of S. Italian or Sicilian type (even if it were only scrap metal) suggests more westerly contacts. One of the pithoi had been full of pomegranates; from inside it came a wooden writing-tablet, 'the oldest book in the world'. Mycenaean pottery of period LH III A2 suggests a date for the wreck in the middle of the 14th century BC, but a gold scarab of Nefertiti (datable between 1376/1358 and 1339/1317 BC), especially if it was jeweller's scrap, and no longer in use, and a gold ring, possibly of the period of Ay (late 14th century BC) suggest a rather later date. Below the cargo was a line of stone anchors, weighing 270-350 kg each, laid athwartships; altogether there were 28 anchors on board, some in the bottom of the ship, others on deck. Hundreds of lead net-weights and some fish-hooks have been found. There are several layers of closely-packed ballast stones. The ship's hull is preserved, constructed in the mortice-and-tenon technique; the keel and planks are of fir, tenons of oak (Quercus sp.), and the planking treenails of a hardwood, possibly oak. The spacing of the tenons (approx. 21 cm, centre to centre) is similar to that of later ships such as **Kyrenia**.

The great variety and luxury of the many different finds set this wreck apart from the bulk transport cargoes of later periods. The 200 four-handled copper ingots have been compared with the 200 talents of copper which, according to a Tell el-Amarna tablet, the King of Alashiya sent to an Egyptian pharaoh. Put another way, the copper aboard the Ulu Burun wreck was enough (given tin for alloying) to make the weapons needed to equip a small army.

Frey, 1984; Bass et al., 1984; 1989; Smith, 1985; Pulak & Frey, 1985; Pulak, 1986; 1988b; Bass, 1985; 1986a; 1986b; 1986c; 1987; Pulak & Haldane, 1988; Haldane, C., 1988; forthcoming; Mills & White, 1989; Ridgway, 1989: 132 (citing L. Vagnetti); Lolos, 1990.

Information: G.F. Bass; D.J.L. Gibbins; C. and D. Haldane; C. Peachey; P.M. Warren.

#### **ULU BURUN AREA**

**1194**

Map 1

Turkey

36° 8' N. 29° 41' E. (approx.). 'Not far from the Bronze Age shipwreck at Ulu Burun'. Depth: 42 m.

Tiles.

10th-12th centuries AD.

A wreck of tiles, both flat and cover tiles, was found by an INA survey in 1985. The tiles can be dated to the 10th, 11th or 12th century AD. A Y-shaped anchor found near the tiles does not necessarily belong to the wreck.

Bass, 1986b: 214.

**USTICA A****1195**

Map 11

Italy

38° 43' N. 13° 10' E. On the Secca della Colombaia (or Colombara), N. of Ustica island (Sicily). Depth: 45 m.

Amphoras. 1st century BC (?).

Either one or two wrecks lie scattered at the foot of a reef which rises steeply to 4 m and then to the surface. A survey by INA in 1976 found three amphoras still in situ, probably an early form of Baetican fish-sauce amphora; these amphoras are classed as Dr. 24 by Purpura, who regards the site as a single shipwreck. The INA staff, however, separate this cargo from another, at the same site, of Punic amphoras. These are of form Mañá C2c, late 2nd or 1st century BC, and could be contemporary with the 'fish-sauce' amphoras. The lead anchor stocks, lead tubing, mill-stones and hull remains reported from the site may therefore belong to a single wreck of the 1st century BC.

Purpura, 1975: 74-8; 1986: 145-6, no. 37.

Information: R.G.M. Piercy.

**USTICA B****1196**

Map 11

Italy

38° 42' N. 13° 10' E. (approx.). 'Off Villaggio dei Pescatori'; detailed location not reported. Depth: 30-35 m.

Amphoras and pottery. c. 350-250 BC (?).

Only a brief report has been published of a second Punic wreck off Ustica. The amphoras are of type Mañá C1b, which (according to Guerrero, 1986) should be dated to the later 3rd or early 2nd century BC. Pottery bowls from the site appear to have been part of the cargo.

Tusa, 1971: 264; Purpura, 1986: 145-6, no. 36.

**VACHETTA A****1197**

Map 6

France

41° 21' N. 9° 13' E. At Vachetta reef in the Strait of Bonifacio; detailed location and depth not reported.

Amphoras. c. AD 1-75 (?).

Four Dr. 2-4 amphoras, of different profile but all probably of Spanish origin, one stamped with a three-letter stamp on the foot, together with copper or bronze nails and a small lead bar, indicate a likely wreck in shallow water on the reef.

Unpublished.

Information: W. Bebko.

**VACHETTA B** **1198** Map 6 France

41° 21' N. 9° 13' E. At Vachetta reef; detailed location and depth not reported.

No cargo (?). c. AD 320-340.

At least 400 coins were found at Vachetta reef in 1971; they are small bronzes of Constantine, from the mints of Rome, Antioch, Trier and London.

Liou, 1973: 605.

Information: W. Bebko.

**VADA A** **1199** Map 7 Italy

43° 21' N. 10° 26' E. Near the mouth of R. Fine; close to the coast. Depth: 9 m.

Amphoras and pottery. c. 100 BC.

A cargo of Dr. 1B amphoras, stopped with a pozzolana seal marked **M(AN).RVF M(AN)** (twice). There are also some Dr. 1C amphoras. A substantial quantity of Camp. B plates and cups was also found - probably cargo; other pottery, certainly for shipboard use, comprises two coarseware jugs (pitched inside), a flat-bottomed dish and a large lid. There are at least six fine-wall cups, datable (like the amphoras) 125-75 BC. There are finds of other periods from the site, which has not been systematically explored; nonetheless, the wreck provides useful cross-dating for Dr. 1 amphoras.

Massa, M. in Martelli et al., 1982: 57-62.

**VADA B** **1200** Map 7 Italy

43° 21' N. 10° 26' E. (approx.). Near Vada; detailed location and depth not reported.

Amphoras. c. 200-150 BC (?).

A wreck of Graeco-Italic amphoras, identified in the published report as of the latest type (cf. Will type E).

Barbieri & Maleci, 1978. This site is not mentioned in Martelli et al., 1982.

**VADA C** **1201** Map 7 Italy

43° 20' N. 10° 21' E. At the W. end of Le Secche di Vada; N. of the lighthouse. Depth: 23 m.

Amphoras. 1st century AD (?).

About ten amphoras of form Dr. 2-4 of Spanish type have been reported; no other information is available.

Massa, M. in Martelli et al., 1982: 58-9.

**VADA D**    **1202**    Map 7    Italy  
43° 18' N. 10° 21' E. Off Le Secche di Vada; S. of wreck C. Depth: 70 m.  
Amphoras.    1st century AD.

A wreck with amphoras probably of form Dr. 7-11 has been reported by divers, but no material has been seen by archaeologists.

Massa, M. in Martelli et al., 1982: 58-62.

**VALENCIA**    **1203**    Map 1    Spain  
38° 48' N. 0° 12' E. (approx.). Off the coast of Valencia province. Location and depth not reported.  
Amphoras (?).    Roman period.

Finds from a site off the coast of Valencia comprised an incomplete Roman amphora, a lead anchor-stock, three bronze nails and various pieces of lead. No further details of this material, or of other occasional finds mentioned in the same report, have been published.

Pla, 1972: 343.

**VALLE ISOLA A & B**    **1204-1205**    Map 8    Italy  
44° 40' N. 12° 13' E. Near Comacchio in the Po delta region.  
No cargo.    1st-3rd centuries AD.

Two dugouts of pedunculate oak, 14.76 m and 12.10 m long, were found near Comacchio in 1948. Some Roman material was found during the removal of the boats, and one has been dated by C<sub>14</sub> to the Roman period, ad 140±140. The site may have been a boatyard.

Alfieri, 1968: 191-2; McGrail, 1978: 112; Berti, 1986b: 20-23.

**VALLE PONTI**    **1206**    Map 8    Italy  
44° 40' N. 12° 10' E. (approx.). At Valle Ponti, near Comacchio; now 4 m below ground level, but originally stranded on a sandy beach.  
Amphoras, lead ingots, votive models and wood.  
25-1 BC.



A well-preserved boat, complete with cargo, was found accidentally in 1980 and excavated by F. Berti. The centre of the hold was occupied by a large load of shingle; fore and aft of it was a variety of cargo goods. There were cargo amphoras of four forms: some probably local - Dr. 6 - but the others of E. Mediterranean origin - Dr. 2-4 with Greek painted inscriptions (perhaps actually Coan), Chian, and one-handled amphoras (Panella 36). Other amphoras, found in only single examples, included several from Greece or the East. Amidships lay 102 lead ingots, of five varieties of shape, but practically all marked with the counterstamps **L.CAE.BAT** and **AGRIP**, many also with **MAT**, **GEME**, **MAC**, **C.MATI**, or one of three monograms; not all the ingots have a mould-mark, but when there is one which can be made out it contains a caduceus. Agrippa was in Spain, and honoured by Cartago Nova (centre of the main lead-mining area) in 19-18 BC, so a Spanish origin is likely enough. There may have been a consignment of coarse pottery (pots, jars, etc.) and another of bronze vessels, including pots, strainers, ladles, pans, baking-pans and plates. Six tiny votive models of temples, each with Hermes or Venus inside, and fitted with a suspension ring, were made of lead. A number of 5 foot long boxwood logs were apparently cargo. Seventeen lamps, one marked with a scratched anchor device, several small boxes and clasps, a coin, and only one glass vessel (a blue ribbed bowl) were found.

A good deal of the ship's equipment was preserved, including baskets, leather bags, sacks, and a collection of carpenter's tools. One basket contained shellfish, another fish-hooks. There were a dozen shoes and sandals (one to fit a woman or boy), a large stone weight, weighing 32.7 kg (100 pounds) inscribed **M** and **T.RVFI** (perhaps the shipowner's name) and a bronze balance; in the stern was a galley, with a brick hearth, a gridiron and two bronze pots with signs of use. Articulated animal bones indicate a provision of fresh meat and a consignment of salt mutton. There was a living space forward, where strigils, bath-flasks, dice, gaming pieces and a sword were found.

The ship was approx. 25 m long overall and 5.4 m in beam. She had a flat keel; no mast was found, though some rigging was preserved. The lower part of the hull was assembled by sewing; the planking seams were caulked (with vegetable fibre, pitched) and stitched. The frames were fastened to the planking by cords. Much of the bottom was ceiled with planks. An iron anchor was found near the bow.

The importance of this site for both trade and ship studies, and the vivid illustration it gives of navigation in the upper Adriatic, need no emphasis. The hull has been raised and is being conserved.

Ruscito, 1982; Bonino, 1985: 91-3; Berti, 1985; 1986a; 1986b: 25-36; 1987; 1990.

#### **Valle Ponti: another site**

A second boat, found in 1982 and partly salvaged, has not yet been studied; it may be late Roman or early medieval.

Berti, 1986b: 32.

#### **VARAZZE**

1207

Map 7

Italy

44° 22' N. 8° 34' E. (approx.). Off Varazze, near Savona; location and depth unknown.

Amphoras.

c. 100-50 BC (?).

Dr. 1B amphoras brought up by fishermen off Varazze on at least three occasions represented a wreck, in the opinion of Lamboglia.

Lamboglia, 1952c: 226-8.

**VARNA** 1208 Map 1 Bulgaria

43° 7' N. 27° 57' E. (?). In the bay of Varna; detailed location and depth not reported.

Amphoras. 4th-5th centuries AD (?).

A cargo of late Roman amphoras has been only summarily reported.

Lazarov, 1985: 138.

**VARVARA** 1209 Map 1 Bulgaria

42° 7' N. 27° 56' E. (approx.). In the bay of Varvara, near Achtopol; detailed location and depth not reported.

Copper ingots. 6th-5th centuries BC (?).

A group of cylindrical copper ingots from Varvara bay appears to be the remains of a wrecked cargo. There is no associated material, but the middle of the first millennium BC seems a likely date.

Velkov, 1986: 292.

Information: V. Velkov.

**VECHTEN** 1210 Map 15 Netherlands

52° 4' N. 5° 12' E. At a silted-up site near the fort at Bunnik.

No cargo. 1st century AD (?).

A boat, 12 m long x 3 m beam, of rounded section, with a pointed bow, was constructed with mortice-and-tenon joints and fastened with treenails. Its position and associated finds suggest a date early in the Roman period; it could have been built to transport troops, using oars, in an Augustan offensive.

Muller, 1895; Marsden, 1976: 51; Hückmann, 1991: 98.

Vela Svitnja: see **Vis A**.

**VENDICARI** 1211 Map 11 Italy

36 48 N. 15 6 E. On a submerged reef in the bay S. of Torre Vendicari, near Pachino (E. Sicily). Depth: 3-7 m.

Amphoras. c. AD 375-625.

A scattered cargo, mainly of globular Byzantine amphoras (Riley LR2), together with at least one 'spatheion' and other amphoras including one of form Keay 53, lay hidden by sea-grass on a reef in the centre of Vendicari bay. The cargo is now thoroughly looted, but must originally have been substantial.

Parker, 1981b: 330-3.

Information: G. Kapitän.

**VENTOTENE A** 1212 Map 9 Italy

40° 47' N. 13° 25' E. Off Ventotene island; location and depth unknown.

Amphoras. c. 325-275 BC (?).

Two Graeco-Italic amphoras (Will type A), divers' finds, probably came from a wreck.

Gianfrotta, 1986: 214.

**VENTOTENE B** 1213 Map 9 Italy

40° 45' N. 13° 25' E. Off Ventotene island; on a sandy bottom. Depth: 25 m.

Amphoras. Mid 1st century BC.

Little is known of a looted wreck of Dr. 1B amphoras somewhere off Ventotene. An underwater photo also shows the neck of an Apulian amphora.

Cecchini, 1980: 44-5; Gianfrotta, 1986: 214.

#### **Ventotene: other sites**

A brief news report (with photo) refers to the raising of a lead anchor-stock from a site where there were also remains of wine amphoras, said to be datable to the 3rd century AD; the site is not mentioned in a more recent, authoritative review of Ventotene wrecks.

Mondo Sommerso, 14. 1 (1972): 125; Gianfrotta, 1986.

What may be a further wreck, in approx. 5 m depth 'near Cala Rossana', has been briefly reported.

Gandolfi, 1985b: 673.

Ventotene: see also **Cala Rossano, Le Grotticelle & Punta dell'Arco.**

**VICHY** 1214 Map 15 France

46° 5' N. 3° 15' E. In the R. Allier at Vichy; found by dredger.

Pottery. c. AD 100-150.

In 1964 the remains of a boat laden with decorated and stamped Central Gaulish terra sigillata were brought up during dredging, but no archaeological record was made at the time. The pottery includes the stamps **DIVICATVS**, **GNATI.M** and **REGINI.M**, datable between the late Flavian period and the Antonine period, and decorated ware by Cettus and in the style of Cinnamus. A wide date bracket is suggested in the published accounts, but the Trajanic-Hadrianic period seems entirely appropriate. Timbers (perhaps frames) were also found. Most of the boat must still be in the river-bed.

Corrocher, 1977; 1980.

**VIESTE** 1215 Map 1 Italy

41° 50' N. 16° 12' E. Off the tip of the Gargano peninsula; detailed location and depth not reported.

Tiles. Medieval period.

A shipload of curved tiles, each about 25 x 80 cm, possibly medieval, has been investigated near Vieste, but no report has been published.

Ferrandi, 1980.

**VIGANJ** 1216 Map 1 Croatia

42° 58' N. 17° 7' E. At Punta Sv. Ivan, Pelješac peninsula; close to the rocky point. Depth: 28-30 m.

Pottery. 2nd century AD.

A substantial cargo of pottery, estimated at 50,000 pieces, lay on a gentle slope; the site has been much looted, and, though the pots lie akimbo in the published underwater picture, they were probably originally nested and/or stacked. The majority of vessels in the picture are shallow casseroles; other forms found were plates, frying-pans, bowls, jugs, lids and grills. The ware is probably of Aegean origin. The ship's hull is preserved, though no individual features are visible in the published illustration.

Rapanić, 1972a; 1972b; Vrsalović, 1974: 39 & 239-40, figs 2, 30 & 67; Istenić, 1988.

See also **Nerezine** and **Pakleni**.

**VIGNALE** 1217 Map 6 France

42° 0' N. 9° 29' E. Near Ghisonaccia (Corsica). Depth: 12-13 m.

Amphoras (?). c. AD 307-310.

A wreck off Vignale beach was declared in 1981. No trace of the hull was found. There were amphora sherds (including late Roman cylindrical amphoras), a bronze pitcher handle, and a large bronze coin hoard. Over 1,000 coins survive, 80% Maxentius, with Diocletian, Maximian, Constantius and Constantine Caesar, from mints as yet unidentified.

Liou, 1982: 454.

**VILLEFRANCHE** 1218 Map 5 France

43° 40' N. 7° 19' E. At the foot of Cap Ferrat, at the entrance to Villefranche bay; on a slope SW. of the headland. Depth: 30-46 m.

Amphoras. c. 175-150 BC (?).

Graeco-Italic amphoras (similar to those of **Chrétienne C**) and a lead anchor-stock are said to have been found in a wreck discovered in 1954 but only summarily reported.

Benoit, 1956: 34.

**VILLEPEY** 1219 Map 5 France

43° 24' N. 6° 42' E. SW. of Fréjus; in a sanded-up river-bed or lagoon, near the sea.

Amphoras. c. AD 110-160 (?).

At least one sunken ship was found during sand-digging near the Étangs de Villepey. The cargo consisted principally of Dr. 20 amphoras, with terracotta stoppers, sealed with pozzolana; the published profiles suggest a 2nd century date, which is also appropriate to one stamped **P.CLODI ICELI**. Some amphoras were filled with olives (of which two types of pits were noted). There were also smaller containers and a Gaulish (G4) amphora. Fragments of an Almagro 51A and an Afr. 2 amphora, however, must be contamination. The existence of a ship is proved by part of an elmwood frame, with treenails and copper nails. Found nearby, and not certainly associated, were an iron anchor, a concretion containing an iron anchor-ring and a length of chain.

Benoit, 1960: 45-9; Boyer & Fevrier, 1971.

**VIS A** 1220 Map 8 Croatia

43° 4' N. 16° 10' E. (?). In Vela Svitnja bay (not located), on the N. side of Vis island. Depth: 30-35 m.

Amphoras and pottery. Late 2nd-early 1st century BC.

Some 600 amphoras have been raised from a Lam. 2 cargo on Vis, estimated at 800 amphoras originally. Only a minority of the amphoras are unstamped; the

stamps (on the handle) include LABEO, L.PO(N)T, MENOP, M.POT, PILIPI, SONIC, and anepigraphic stamps. Besides the Lam. 2 amphoras, there were some others with a straight neck and an egg-shaped body. A substantial quantity of black-gloss pottery of a variety of forms, including plates and jugs, was probably also cargo. Shipboard material included two Roman asses.

Cambi, 1972; Vrsalović, 1974: 53 & 239-40; Cambi, 1989: 311-5.

**VIS B**    **1221**    Map 8    Croatia

43° 4' N. 16° 11' E. (approx.). On the N. coast of Vis island. No further details reported.

Amphoras.    c. 150-25 BC (?).

A wreck with a cargo of Dr. 1 amphoras was briefly reported by N. Cambi (Lipari, 1976). The site appears not to be mentioned by Vrsalović (1974).

Unpublished.

**VIS C**    **1222**    Map 8    Croatia

43° 4' N. 16° 13' E. Near the entrance to the harbour of Vis; at Krava islet, off Bela Suikia point. Depth not reported.

Amphoras.    Mid 2nd century BC (?).

A well-preserved cargo, with amphoras in regular, inclined files, was reported by Vrsalovic. The amphoras appear to be of Transitional form. This is presumably the wreck reported by Cambi (Lipari, 1976), which had amphoras similar to Graeco-Italic and also related to Lam. 2 or Dr. 6. This wreck also had a Camp. B bowl and a lamp; the hull was preserved, and a sample was identified as pine.

Vrsalović, 1974: 240 & fig. 27.

**VIS D**    **1223**    Map 8    Croatia

43° 4' N. 16° 12' E. Off Host islet, in the entrance to the harbour of Vis. Depth: not reported.

Amphoras.    3rd-2nd centuries BC (?).

A 3rd/2nd century amphora wreck was listed without further details by Vrsalović.

Vrsalović, 1974: 240, no. 14.

**VIS E**    **1224**    Map 8    Croatia

43° 3' N. 16° 15' E. At Mala Smokova (or Smokova Mala), Vis. Depth not reported.

Amphoras. 5th-6th centuries AD.

An amphora wreck of the 5th/6th centuries AD has been reported without details.

Vrsalović, 1974: 240, no. 16.

**VIS F** 1225 Map 8 Croatia

43° 4' N. 16° 12' E. Near the harbour of Vis. Depth not reported.

Tiles. Roman period.

A tiles wreck, probably Roman, has been briefly reported.

Vrsalović, 1974: 240, no.29.

**VIS G** 1226 Map 8 Croatia

43° 0' N. 16° 3' E. On the N. side of Stupišće point, at the W. end of Vis; depth not reported.

Amphoras. Roman period.

A Roman wreck on Vis was found to be so badly damaged by looters that it was impossible for a recent survey to identify the amphoras.

Orlić & Jurisić, 1987c.

**VOULA A** 1227 Map 13 Greece

37° 49' N. 23° 44' E. In the Saronic Gulf; by the S. edge of Prasonisi, near Voula. Depth not reported.

Amphoras. c. 350-325 BC.

A cargo of amphoras from Chios and Lesbos, thought to be wine-jars, has been briefly reported.

Hood, 1961-2: 5: cf. Clinkenbeard, 1982: 250.

**VOULA B** 1228 Map 13 Greece

37° 49' N. 23° 44' E. By Mermingia reef, SW. of Prasonisi, near Voula. Depth not reported.

Amphoras. c. 400-350 BC.

A wreck of Mendean wine amphoras has been briefly reported.

Hood, 1961-2: 5.

**VULCANO** 1229 Map 11 Italy

38° 24' N. 14° 59' E. At Punta Lucia (or Luccia), the NE. corner of Vulcano (Aeolian islands). Depth: 12 m.

Amphoras. c. 100-80 BC.

A number of Dr. 1B amphoras lie in sand, close to a submerged rock off the point. An anchor-stock was also found at the site. The ship may be preserved under the sand, and there may be more material further down the slope. The amphoras are identical to those from **Albenga**.

Lamboglia, 1974: 186; Bernabò-Brea & Cavalier, 1985: 66-8.

Information: G. Kapitän.

**VULPIGLIA** 1230 Map 11 Italy

36° 42' N. 15° 08' E. At the entrance of Cala Vulpiglia, Morghella, near Pachino (E. Sicily). Depth: 5-7 m.

Amphoras. 300-290 BC.

A cargo of Corinthian B amphoras, completely broken, lay scattered on a rocky bottom covered by banks of sand. Several amphoras were stamped. Other amphoras, including Corinthian type A, were found in smaller numbers and presumably represent shipboard stores. Over 20 pieces of black-gloss pottery, apparently Attic or Corinthian, also represented shipboard equipment, as did several casseroles and other cooking-pots, blackened with soot. Over 40 bones and teeth included ox and sheep/goat, as well as a tibia and two humeri from at least two humans.

Personal items comprised part of an alabaster toilet-box, a bronze handle (perhaps tinned) and an iron blade (possibly a sword). A unique find was the modelled head of a silenus, in terracotta, 16 cm tall; perhaps this was part of a shrine on board. Some fragments of tiles may have been part of the ship's structure; so, too, were two pieces of pine, of which one was a strake, with closely-spaced mortices, on a scale appropriate to a medium or large-sized vessel. Lead sheets with nail-holes had perhaps been carried on board as patches, rather than been applied to the underside of the hull as a sheathing.

Koehler, 1979a: 46-7; Parker, 1980: 56-70; 1985.

Information: G. Kapitän; C.G. Koehler.

**WANTZENAU** 1231 Map 15 France



48° 40' N. 7° 50' E. Found beside the Rhine, N. of Strasbourg.

Mill-stones. Late 3rd century AD.

A cargo of mill-stones made of lava from Andernach (300 km from the find-spot) was found, together with some remnants of the boat. The original length must have been 6½ m, the probable load 3½ tons. The hull was strongly rounded, with compound ribs and a small rabbet near the gunwale; the strakes were fastened with treenails. The vessel was apparently propelled (at any rate for some of the time) by punting; the remains of an iron-mounted pole were found. Other finds included the leaden end of a sounding-pole, three bronze vessels, an axe-hammer, and a drill.

Ellmers, 1969: 92-5 (with reference).

Whitstable: see **Pudding-Pan Rock**.

**WOERDEN** 1232 Map 15 Netherlands

52° 6' N. 4° 52' E. In a branch of the Old Rhine. Silted.

No cargo. c. AD 170-175.

A river-boat, generally similar to the **Zwammerdam** boats, was partially excavated. The estimated length of the complete boat is 29.6 m (100 feet); construction was by pairs of L-shaped frames, with planks fastened by nails. The mast-step was preserved. There was a fire-place, made of planks and filled with sand, covered by bricks; this, together with pottery and shoes, showed the crew lived on board. Tree-ring analysis shows the timbers were cut in AD 169, and pottery indicates the boat sank shortly thereafter. Grain and other botanical remains were recovered from the hull; pollen analysis suggested the boat was normally used to carry spelt wheat.

Bogaers & Haalebos, 1979; Haalebos, 1987.

**XEROLIMNI** 1233 Map 1 Cyprus

34° 54' N. 32° 19' E. On the W. coast of Cyprus, at an exposed site. Depth: 3-4 m.

Amphoras. 3rd-2nd centuries BC.

A dense concentration of shattered amphoras, 25 x 10 m in extent and 30 cm thick, evidently represents the wreck of a Hellenistic ship. The site will have been deeper, and further from the coast, in antiquity.

Cyprus, 1985: 51; Giangrande et al., 1987: 192.

**XLENDI A, B, & C****1234-1236**

Map 12

Malta

36° 1' N. 14° 12' E. The remains of what were most likely three wrecks lie scattered on the steep-sided reef which projects westward from Ras il-Bajda, on the W. side of Gozo. The finds are mostly from deep water (30-60 m).

**A. Amphoras.** c. 150-75 BC (?).

A Dr. 1A, a Lam. 2, two Dr. 18 and an ovoidal amphora are preserved; some smaller (local?) jars may also belong.

**B. Amphoras.** 1st century AD (?).

Dr. 2-4 amphoras (one stamped **EROI** on the neck): seven amphoras are preserved.

**C. Amphoras.** c. AD 350-450 (?).

Cylindrical late Roman amphoras (Keay form 25); two amphoras are preserved.

No detailed report on this group of wrecks has been published. Material has been raised over the years without being related to a single plan of the bottom.

Scicluna, 1965.

Information: R. Grima; J.A. Riley.

**XLENDI D****1237**

Map 12

Malta

36° 1' N. 14° 12' E. On the N. side of Xlendi bay, Gozo. Depth: 10-30 m.

**Pottery.** Uncertain date.

A very poorly-preserved wreck lies scattered over a wide area on the N. side of Xlendi bay. Small fragments of coarseware jugs, etc., have been found, not datable from the available illustrations. Experienced divers agree that this is a wreck-site.

Information: various sources, including unpublished expedition reports.

**YALIKAVAK****1238**

Map 13

Turkey

37° 8' N. 27° 17' E. Near Yalikavak, N. of Bodrum; between Myndus Rock and Wreck Rock, off Pasha harbour. Depth: 88 m.

**Amphoras.** 1st century BC (?).

A bronze statue of a negro boy and a figurine of Isis-Fortuna were netted by sponge-draggers in 1963; instrument searches by G. Bass in 1965-8 located a wreck, perhaps the source of the two bronzes. Television pictures showed

amphoras (not identified) and some concretions, in addition to tiles, cooking-ware, a lagynos and a lamp. No further statues were definitely identified from the survey pictures.

Bass, 1966: 82-3; Bass & Fernald, 1971; Bass & Joline, 1968/9.

**YASSI ADA A**

**1239**

Map 13

Turkey

36° 59' N. 27° 11' E. The Byzantine Shipwreck of Yassi Ada. Close to Yassi Ada (Lodo island), near Bodrum. Depth: 32-39 m.

A reef extending 200 m WSW. from the island has caused the loss of several ships. The highest points are just below the surface, at the seaward end. The Byzantine wreck lies, bow to N., on the S. side of the island, to the E. of the reef.

Amphoras.

AD 626 (or soon after).

The wreck was excavated by G.F. Bass in 1961-4, with some minor work in later years; the first part of a full report has been published. The cargo comprised an estimated total of 900 Byzantine amphoras, of which about 12½% are baluster-shaped (Riley LR1), and the rest globular (Riley LR2) of two sizes (9¼% small, 78% large). Amphoras of both forms were pitched inside. None retained a stopper in place, though about 165 stoppers (many cut from old amphoras) were found in the wreck. The baluster-shaped amphoras originate from the Antioch area, but the globular amphoras most likely come from somewhere on the Black Sea. Detailed study of the amphoras indicates that there are some 50 types of the globular amphoras and half-a-dozen of the other form; it seems probable that most, even all, of them were re-used. Many bore graffiti on the shoulder, including **ΦΑΚΕΑ** (lentils), **ΕΛΑΕ** (olives) and **ΡΟΗ** (rice), the names Olympios and Sergios, and religious mottoes and monograms; these inscriptions were apparently incised on the amphoras in an earlier period of use, before they were collected together and loaded on board the ship. Their contents on the final voyage are not certainly known: sieving of silt contained within some of the globular amphoras has produced grape-pips along with other plant remains, and it is thought that most, if not all, of the cargo was wine, perhaps flavoured with anise.

Excavation clearly identified the ship's galley, in which cooking took place on an iron grid above a tile-built hearth; the tiled roof of the galley had a smoke-hole above the fire. In the galley were several bowls, plates and cups, and a considerable number of cooking-pots (both pottery and bronze), storage jars and rosin-lined pitchers. Other items included a pipette ('wine-thief') for drawing liquid from amphoras or fermentation-jars. Most of the pottery is best paralleled in the western Black Sea, Constantinople, Chios and Samos regions, suggesting that the ship's home port lay somewhere to the N. of Yassi Ada. Other shipboard items included lamps, weights, steelyards, a censer, fishing-weights and other gear, a few pieces of glass, a stone mortar, etc.; a large variety of iron tools included not only a carpenter's kit (adzes, hammers, chisels, gouges, bits, compass, nails, etc.) but also bill-hooks, axes and a spade for use on land. The 70 coins recovered included 16 of gold, but the sum represented (about seven solidi) is insignificant compared with the probable value of ship or cargo. The ship carried eleven iron anchors, most of which must have had wooden stocks; several had been repaired, and one was marked **E**.

Detailed study and model reconstruction of the ship indicate that she had a length on deck of 20 m and a maximum beam of 5 m, and probably drew 1.8 m of water (depending on load). The cargo amphoras, if full of liquid, would have weighed about 37 tons; the excavation recovered evidence for only 900, but the

ship could have carried 1,200 at a squeeze, implying an effective maximum load of slightly over 50 tons. This agrees with a calculated tonnage (burden) of 51-58 tons. No evidence for the ship's rig survived, but tests on the reconstruction model suggest that she would have handled better with a fore-and-aft sail.

Bass & Van Doorninck, 1982 (with full references to earlier publications; a good synoptic summary is by Bass, 1971); Van Doorninck, 1984a; 1988; Haldane, D., 1985; Arthur, 1986; Throckmorton, 1987: 86-7.

**YASSI ADA B**

**1240**

Map 13

Turkey

36° 59' N. 27° 11' E. The Roman Shipwreck of Yassi Ada; close to wreck A. Depth: 36-42 m.

Amphoras.

Late 4th-early 5th century AD.

The Roman Wreck was excavated in 1967, 1969 and 1974. The wreck was partly overlain by a 17th-century AD wreck, with neither cargo nor ordnance; the Roman wreck was contaminated with pottery and metal objects from the later ship. The Roman cargo was made up of over 1,100 amphoras, of three forms; their origin has not been determined, though it must be in the Aegean or eastern Mediterranean regions. The amphoras were stopped with cut-out sherds, but what they contained is not known.

Shipboard equipment included two steelyards, jugs of copper and pottery, other coarse pottery, several lamps, and some plates and bowls of African and Cypriot t.s. chiara, datable in the later 4th or the early 5th century. Some bronze coins were found, but were illegible; there were five pieces of glass, including a small, yellowish jar. Study of the hull indicates that the ship measured about 20 m overall and 16 m at the waterline, with a keel 7 m long. The keel, the tenons and the large treenails were of oak, the rest of cypress. The planking was assembled by mortice-and-tenon joints, but they were rather widely spaced, and the tenons fitted loosely in the mortices. The frames were fastened by treenails, though iron nails and bolts were used at certain points, especially where a treenail would have weakened a timber. The frames were fastened to the wales with a treenail, pinned by an iron spike which was driven through and clenched over. The midships half-frames were erected after the first five strakes had been built up on the keel. The hull was pitched internally and ceiled; bilge sludge included sawdust, wood chips and twigs, interpreted as remains of dunnage. The ship had been patched with lead tingles, attached with iron nails. A fragment of what may have been a deck was found. The position of the cargo amphoras in the after part of the ship indicated that there was a bulkhead, aft of which was the galley area, with a stone-built hearth and a tile roof.

Bass & Van Doorninck, 1971 (with references to earlier accounts); Van Doorninck, 1976. For the date, cf. Hayes, 1972: 119 ff; Tortorella, 1981: 365-6 & 378.

**Yassi Ada area**

Several other wrecks are known in the area: cf. **Karabağla**.

**YVERDON A****1241**

Map 15

Switzerland

46° 47' N. 6° 38' E. Found during building work on dry land at Yverdon-les-Bains on L. Neuchâtel.

No cargo.

Late 1st century AD.

The boat was 20-24 m long, flat-bottomed, made of grown frames nailed to unjointed planks which were caulked with moss and rope. Contrary to earlier reports, it seems unlikely there was a mast-step; indeed, the hull was built up at the stern and was therefore probably punted, like river-boats in pictorial representations. A tree-ring date of post AD 77 has been determined.

Weidmann & Kaenel, 1974; Arnold, 1976; 1977; 1978; Weidmann & Klausener, 1985: note 15.

**YVERDON B****1242**

Map 15

Switzerland

46° 47' N. 6° 38' E. Found in 1984 during levelling for building development, 60 m from the site of wreck A.

No cargo.

4th century AD ?

An oak boat, preserved length 9.7 m, maximum beam 1.5 m, lay under 4th century silt layers in an old mouth of the R. Thièle. The planks (not more than 4 cm thick) were lighter than in other boats of this type, and, where the sides were preserved almost to their full height, there were supports for thwarts; these, and holes for oar-loops, showed that the boat was normally rowed. There was a mast-step at each end, and, at the bow, metal bands provided an anchorage for shrouds. The construction resembled other Roman lake boats, with L-shaped frames in close pairs, iron nails, and caulking of cord, moss, and nailed laths. A date for this boat's construction has yet to be determined.

Weidmann, 1984; Weidmann & Klausener, 1985.

**ZAKYNTHOS A****1243**

Map 1

Greece

37° 42' N. 20° 52' E. At the S. end of Zakynthos, by a submerged reef to the NW. of Pelouzo island. Depth: 7-36 m.

Amphoras.

c. 550-450 BC (?).

A scattered wreck extends over 35 x 45 m down slope from the reef, mostly in gullies. Four types of amphoras are present, together with some domestic pottery, a lamp and one or more millstones.

IJNA, 20 (1991 : 354.

Information: M. Bound.



44° 13' N. 15° 9' E. In the Roman harbour SE. of Kremenjača Point, near Nin; behind the breakwater, close to shore. Depth: 2 m.

No cargo.

Late 1st century AD (?).

In the well-marked occupation layer of the harbour, dated by finds to the first three centuries AD, lay the remains of two Roman vessels with sewn planks and a keel. One had caulking of fibre from a creeper, soaked in pitch, between the strakes, and was sewn with a plaited cord of flax or willow. The other boat, not fully excavated or studied, was similar, but retained the ceiling, and also the supporting timbers for a bipod mast. Blocks, shroud tensioners and toggles from rigging were found nearby. Coins of Vespasian said to have been found in the first boat suggest abandonment in the 1st century AD, though one might expect it to date rather from the later years of the port's use. C<sub>14</sub> dates of 2194±128 and 2260±132 BP (Zagreb) may well be contaminated.

Brusić, 1968; cf. Parker, 1980: 43-5; Pomey, 1981a; Brusić & Domjan, 1985.

Information: Z. Brusić.

**ZDRIJAC** 1250 Map 8 Croatia

44° 14' N. 15° 11' E. Close to the beach, N. of Nin. Depth: 3 -4 m.

Amphoras and roof-tiles. 9th-10th centuries AD.

A shipwreck with Byzantine amphoras (one bearing a monogram graffito, another with a painted inscription) produced a concreted hoard of metal objects. These comprised a copper kettle, an iron axe, another axe with its handle, two knives, a chisel, and some nails. A pottery jug and a glass flask were also found in the same deposit. Nearby were three adzes, two scrapers (plane blades?), a plough-share (?), a spear-head, and what could be a crucible. Roof-tiles (both tegulae and imbrices) were found in sufficient quantity to indicate that they, too, were part of the cargo.

Brusić, 1972; 1979.

**ZEMBRETТА** 1251 Map 1 Tunisia

37° 8' N. 10° 47' E. At Zembretta islet, near Zembra. Depth: not reported.

Amphoras. Date unknown.

A wreck with amphoras of undefined type.

Unpublished. Information: R. Vallintine.

**ŽIRJE** 1252 Map 8 Croatia

43° 40' N. 15° 40' E. (approx.). Off Žirje; detailed location and depth not reported.

Amphoras. c. AD 250-450 (?).

A wreck with amphoras of form Almagro 50 was exploited by sponge fishermen. Kisić, 1987: 21, n. 32.

Zlarin: see **Plavac**.

**ŽUT** 1253 Map 8 Croatia

43 50' N. 15 21' E. (approx.). E. of Žut island. Depth: 10-25 m.

Amphoras. c. 150-25 BC.

A relatively well-preserved cargo of Lam. 2 amphoras, found by sports divers in 1971, lay in sand near a rocky slope on which were fragmentary amphoras and a movable lead anchor-stock.

Unpublished. Information: G. Kapitān.

**ZWAMMERDAM A-F** 1254-1259 Map 15 Netherlands

52° 7' N. 4° 44' E. Found in the silted-up Old Rhine by the Roman fort of Nigrum Pullum.

No cargo. c. AD 150-225.

**A.** Logboat, 6.99 m long; decked, and perforated for use as a fishing-boat.

**B.** Barge, 22.75 m long, fastened with treenails and iron nails; fitted with a small mast-step, appropriate to a towing-mast.

**C.** Logboat, 10.4 m long, extended by one strake; fitted with a small mast-step.

**D.** Barge, 34 m long, fastened with large, clenched, iron nails; fitted with a large mast-step, appropriate to a sailing mast.

**E.** Logboat, 5.48m long; decked, and perforated for use as a fishing-boat.

**F.** Barge, 20.25 m long; fitted with a mast-step, but the sloping stem and stern, with iron reinforcements, show it was probably a ferry.

The barges are generally similar to those from **Abbeville**, **Druten**, **Kapel Avezaath** and **Pommeroeul**, and show the development of river transport for heavy goods in response to the needs of the Roman occupation. They were apparently built using the Roman foot (pes monetalis), and may reflect a S. European stitched technique rather than a northern, 'Celtic' tradition of boat-building.

Also at Zwammerdam were found a steering-oar and some boat planking assembled with mortices and tenons, but not of typical Mediterranean (Roman) type.

Weerd, de, 1978 (with references); 1988.



Information: P. Marsden.

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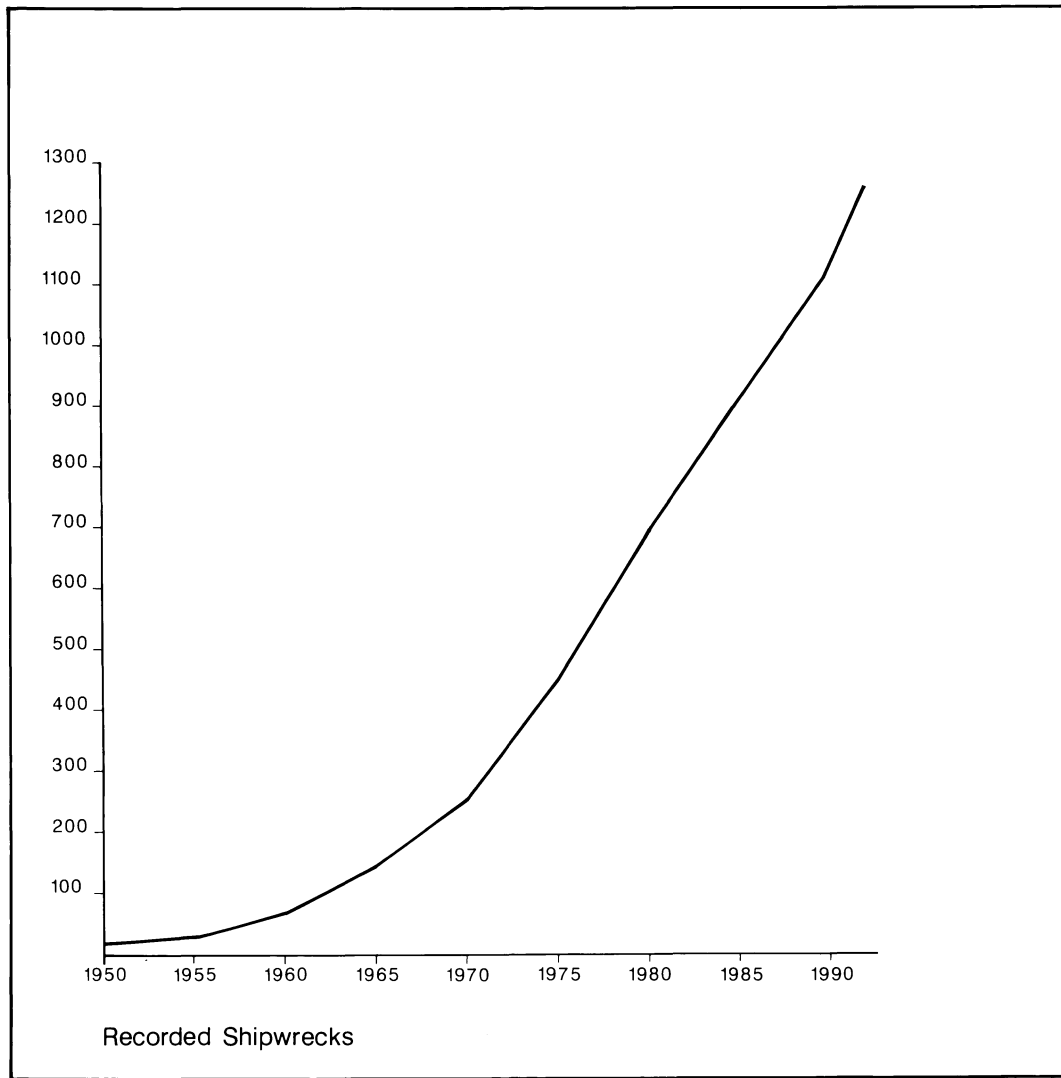


Fig. 1 Recorded shipwrecks: rate of increase in information

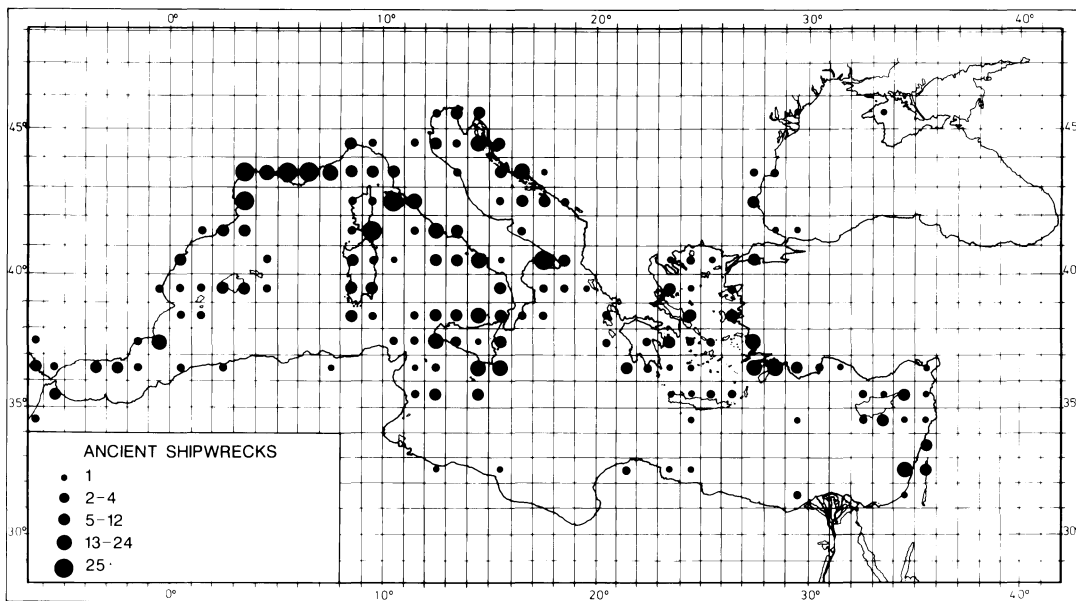


Fig. 2 Ancient shipwrecks: distribution by degree divisions of Latitude and Longitude

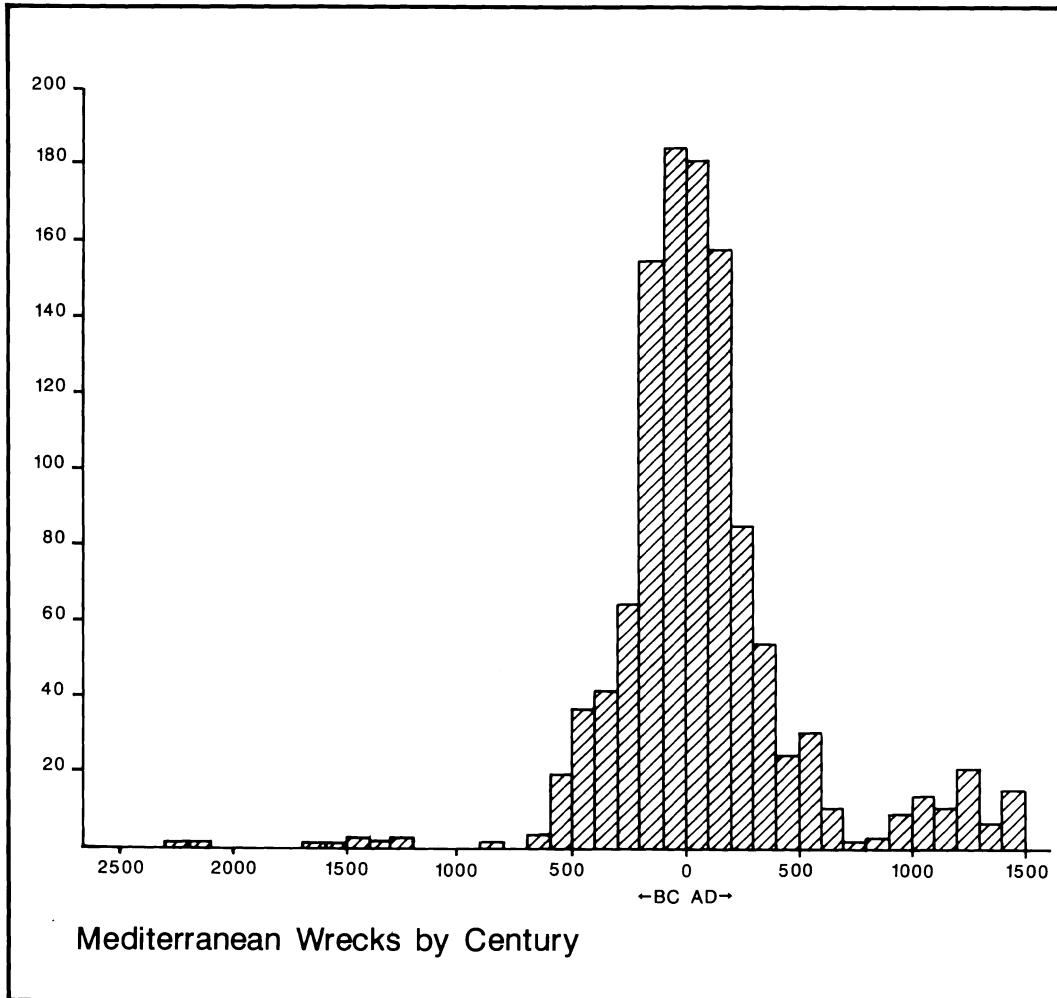


Fig. 3 Ancient shipwrecks: Mediterranean wrecks by date, grouped in centuries

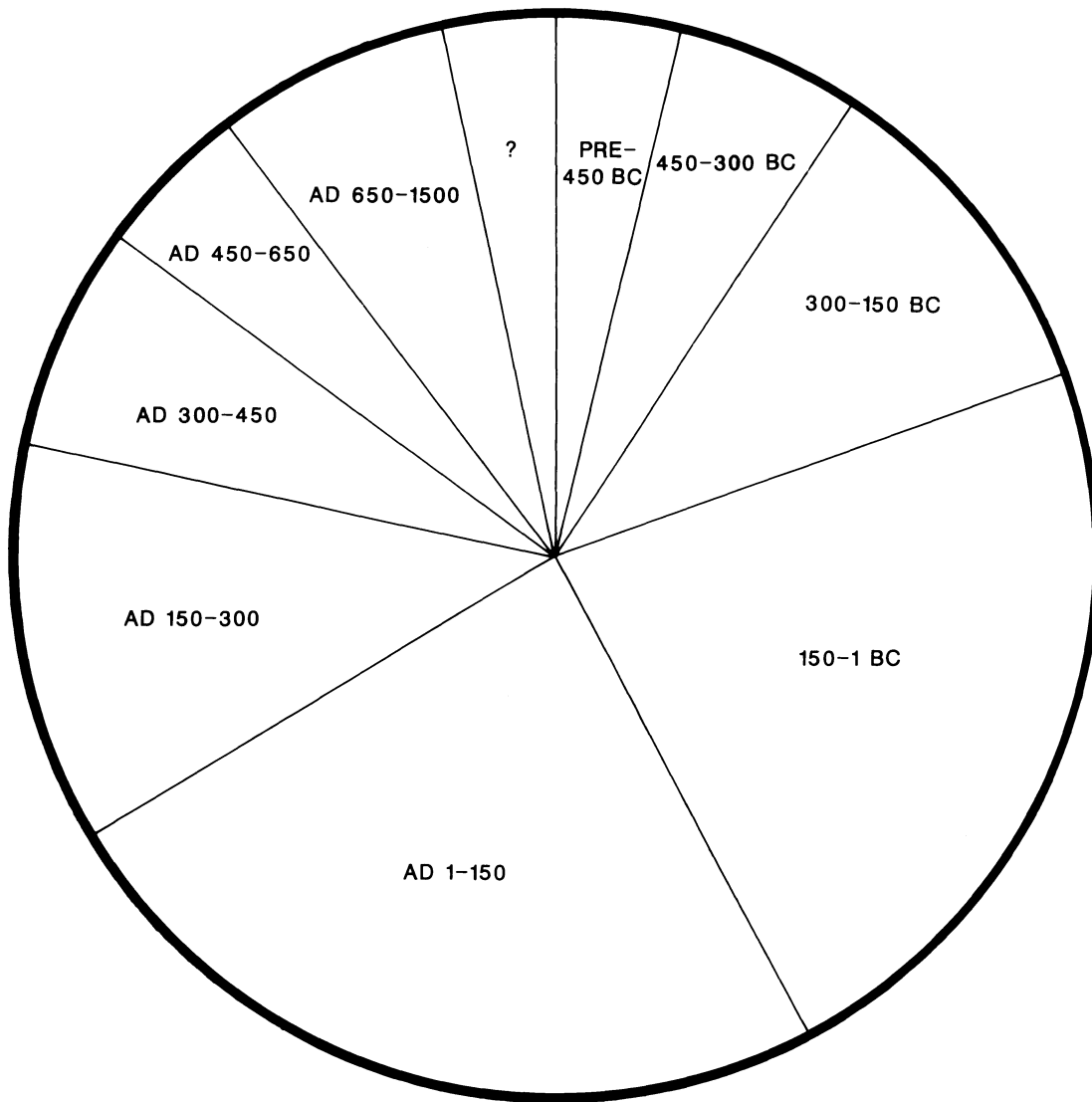


Fig. 4 Ancient shipwrecks: distribution by period

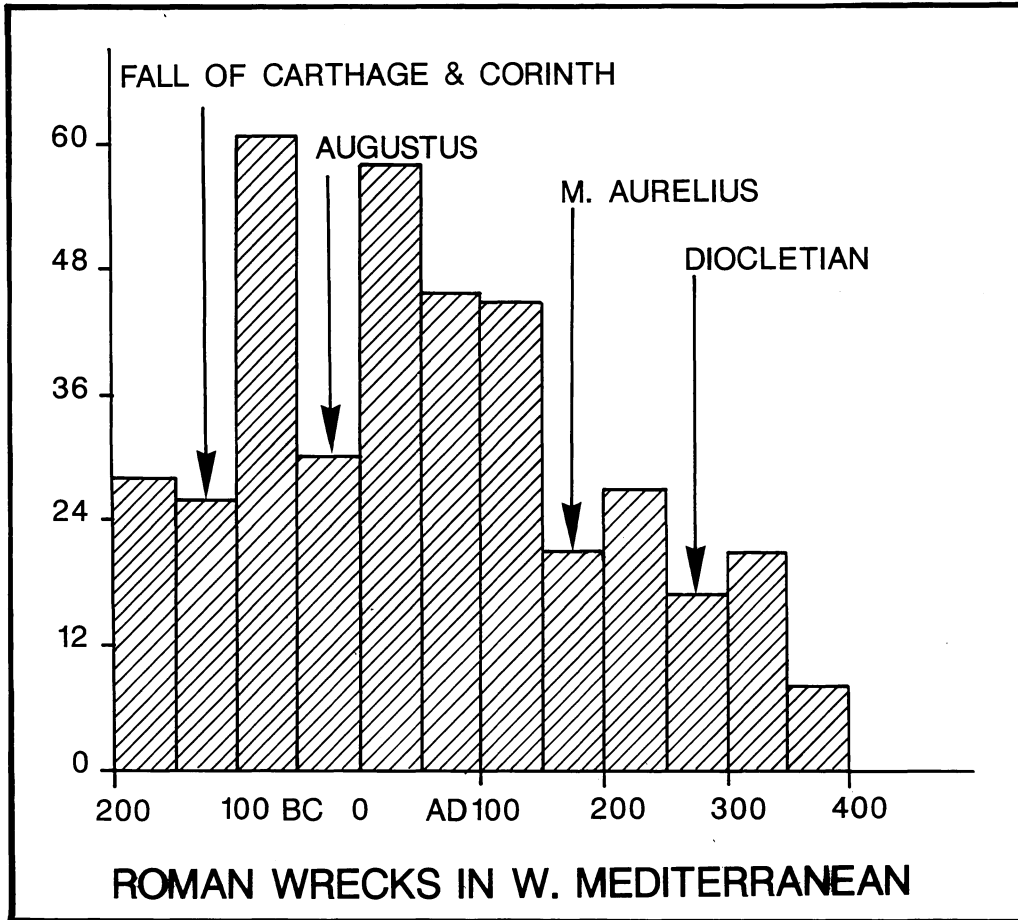


Fig. 5 Roman shipwrecks and historical events

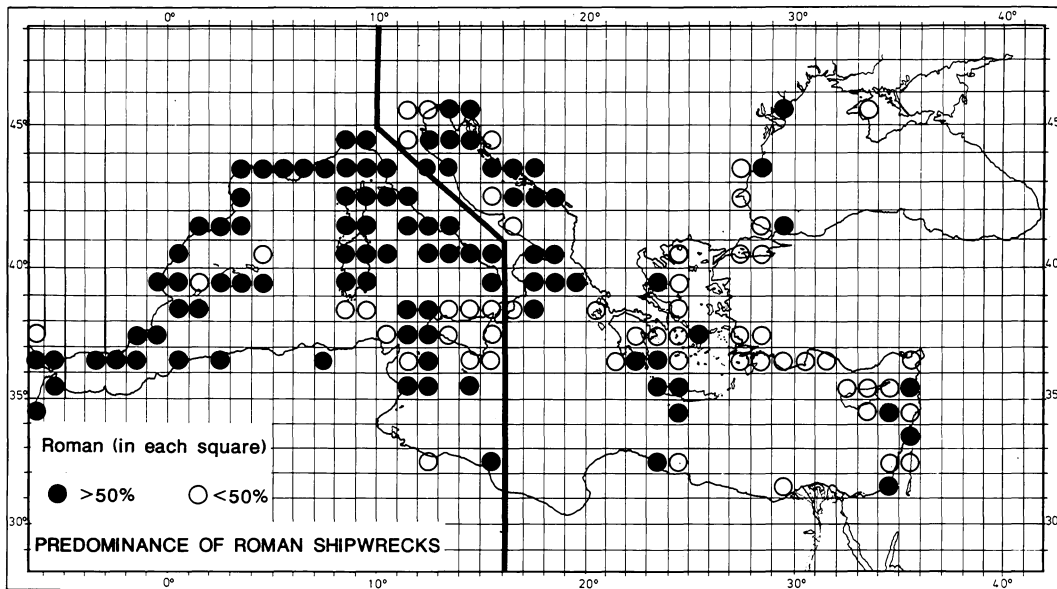


Fig. 6 Roman shipwrecks in East and West Mediterranean

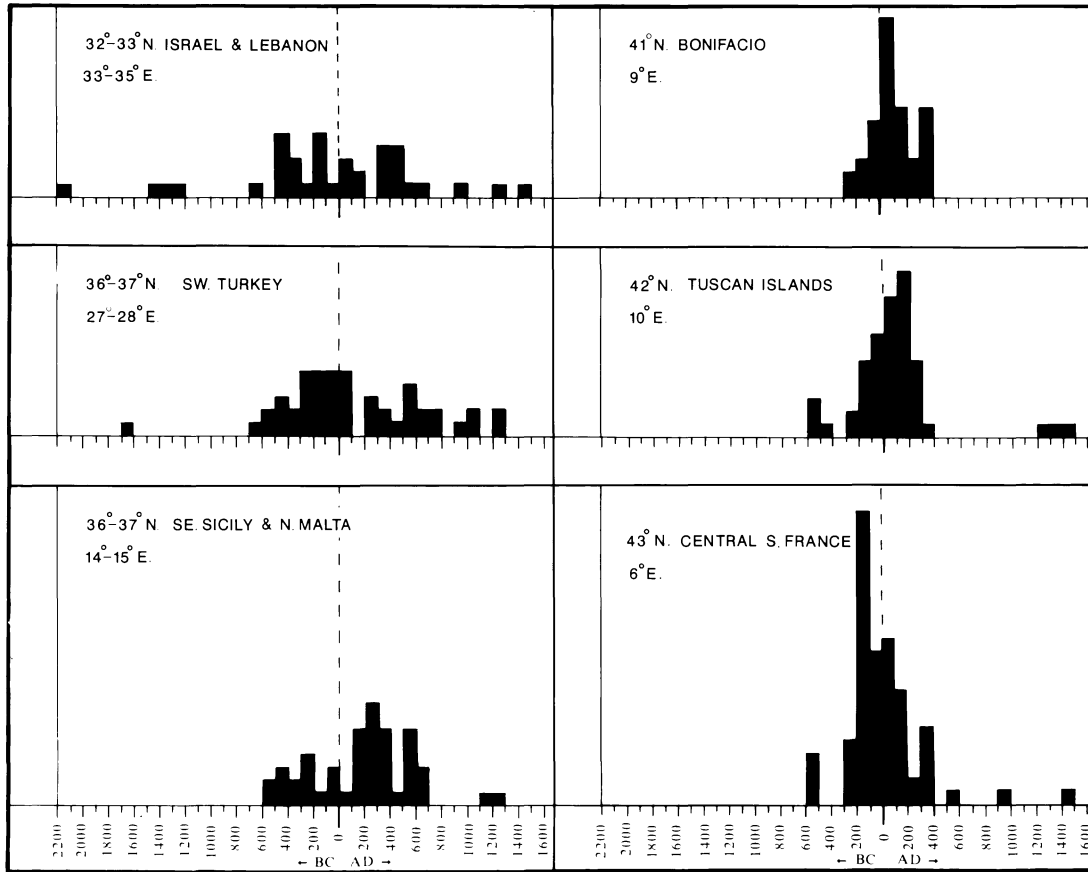


Fig. 7 Shipwrecks in six different areas, by period, compared

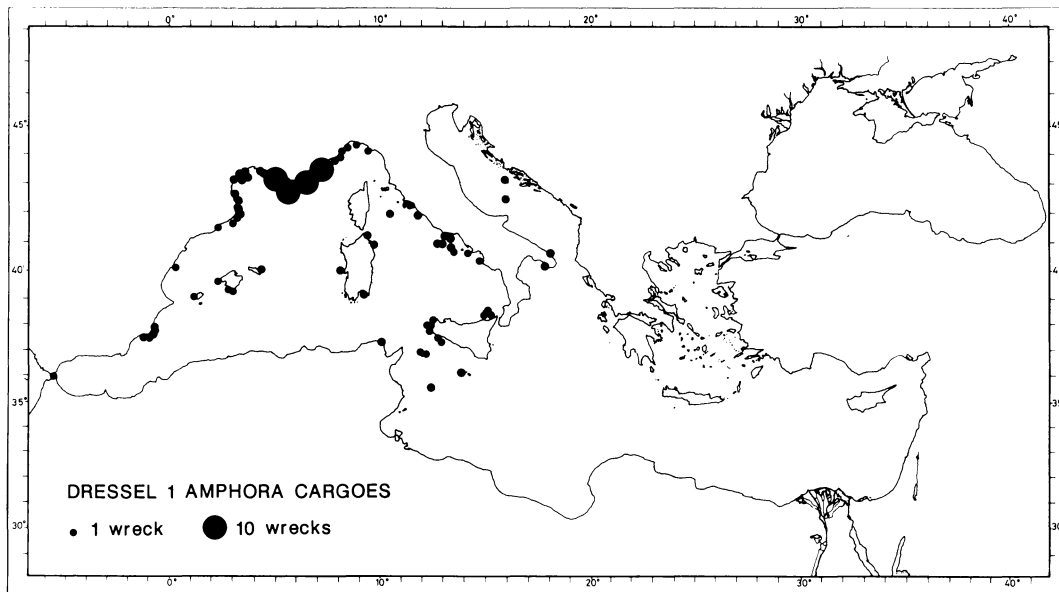


Fig. 8 Dressel 1 amphora cargoes

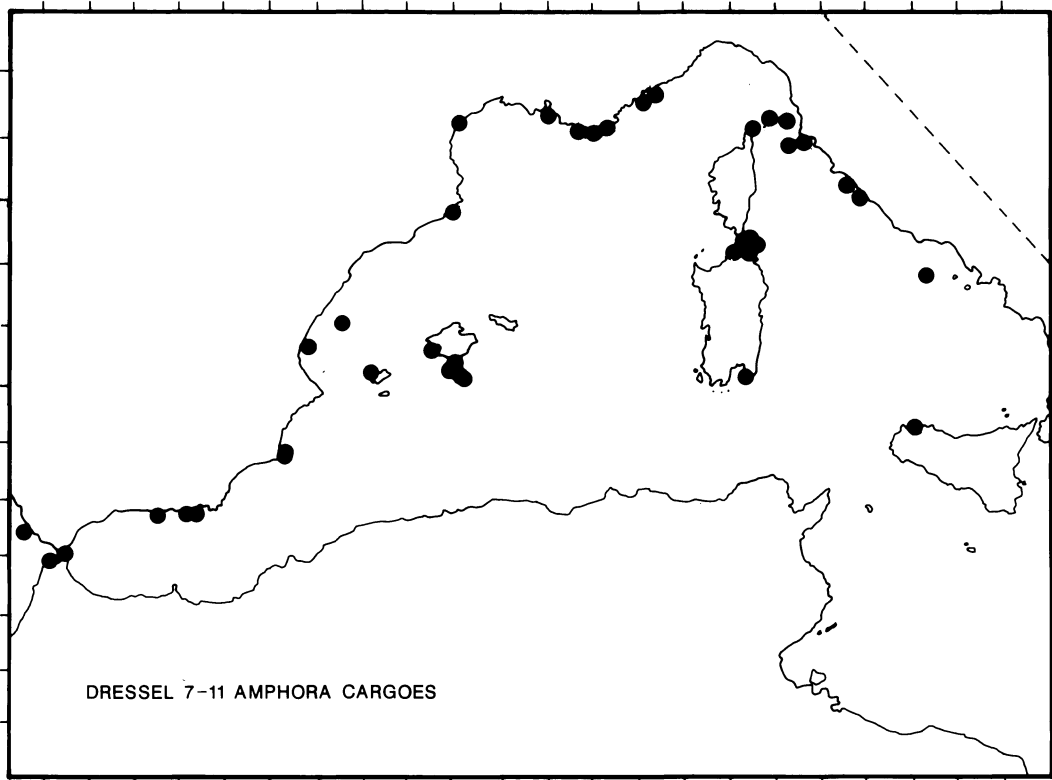


Fig. 9 Dressel 7-11 amphora cargoes

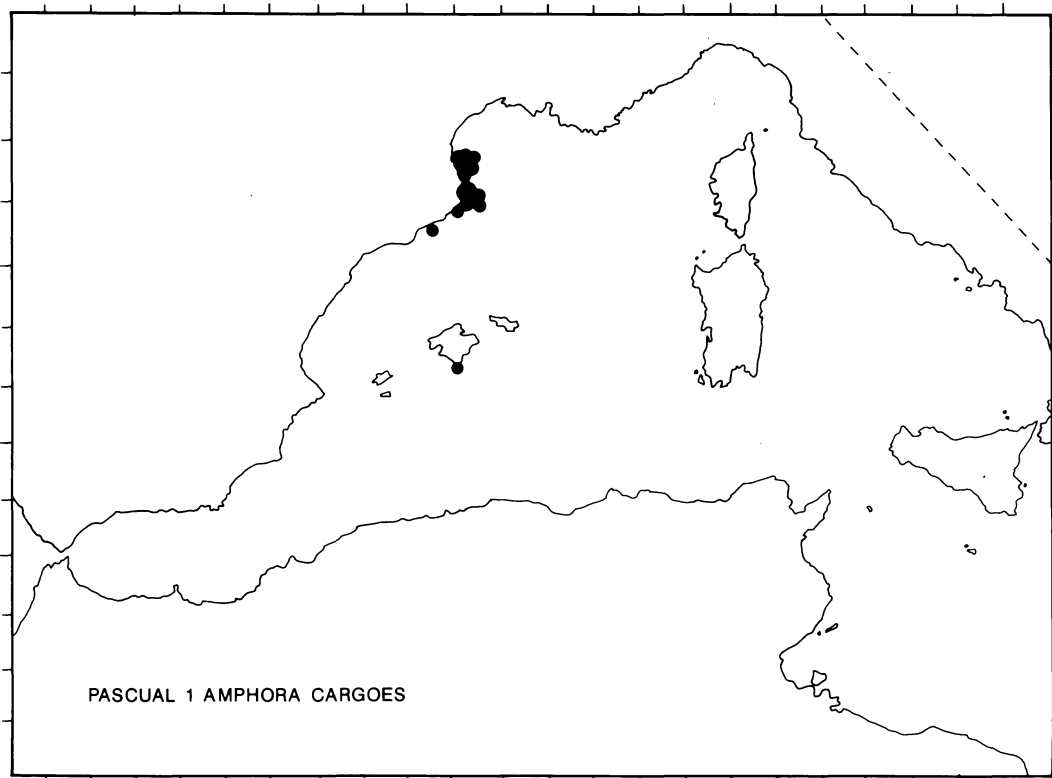


Fig. 10 Pascual 1 amphora cargoes

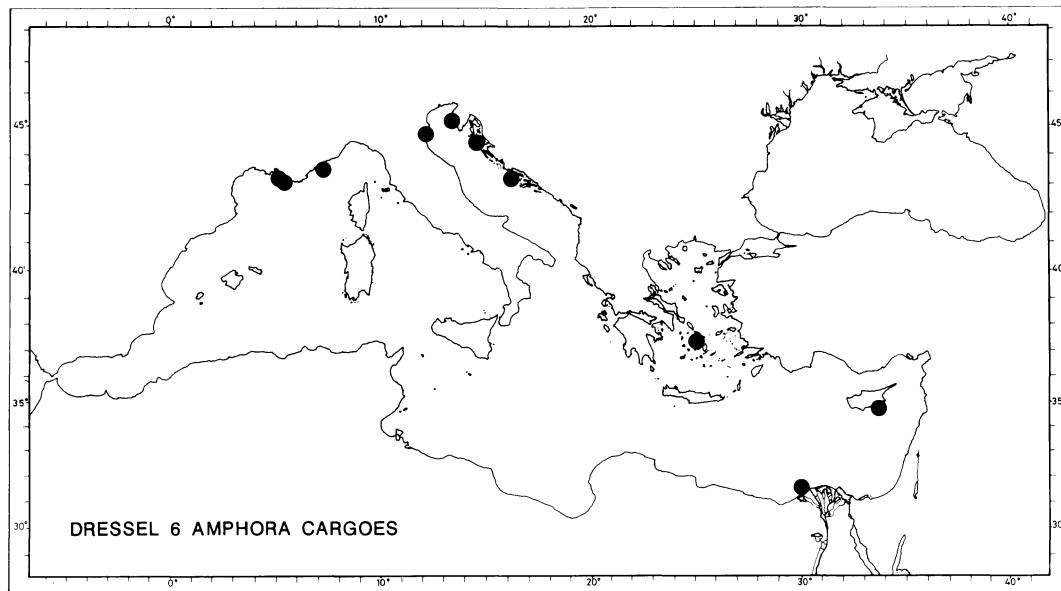


Fig. 11 Dressel 6 amphora cargoes

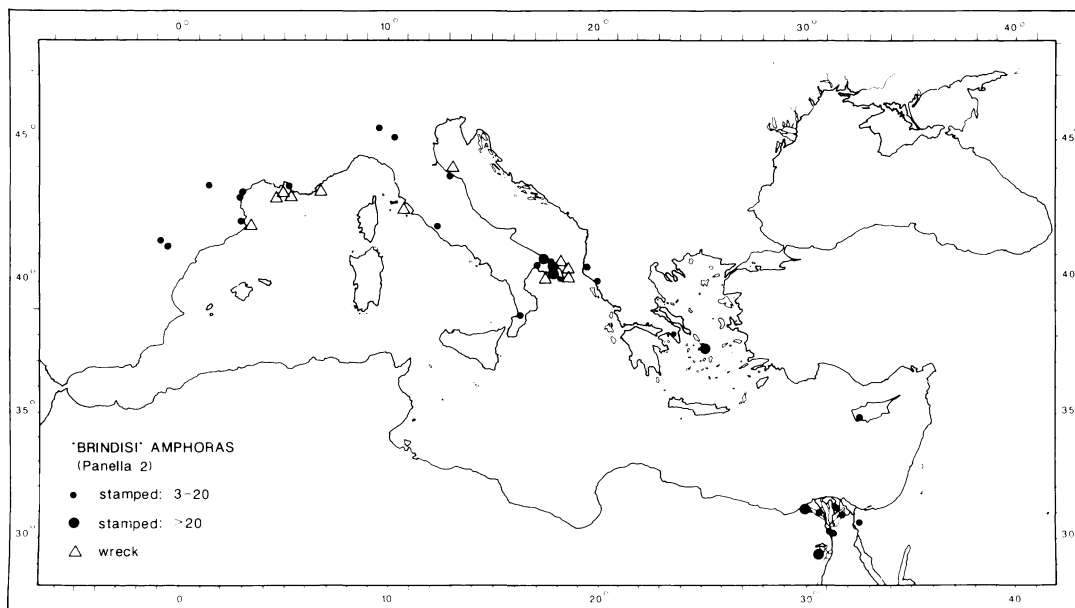


Fig. 12 Spheroidal (cf. Panella 2) stamped amphorae and wrecks

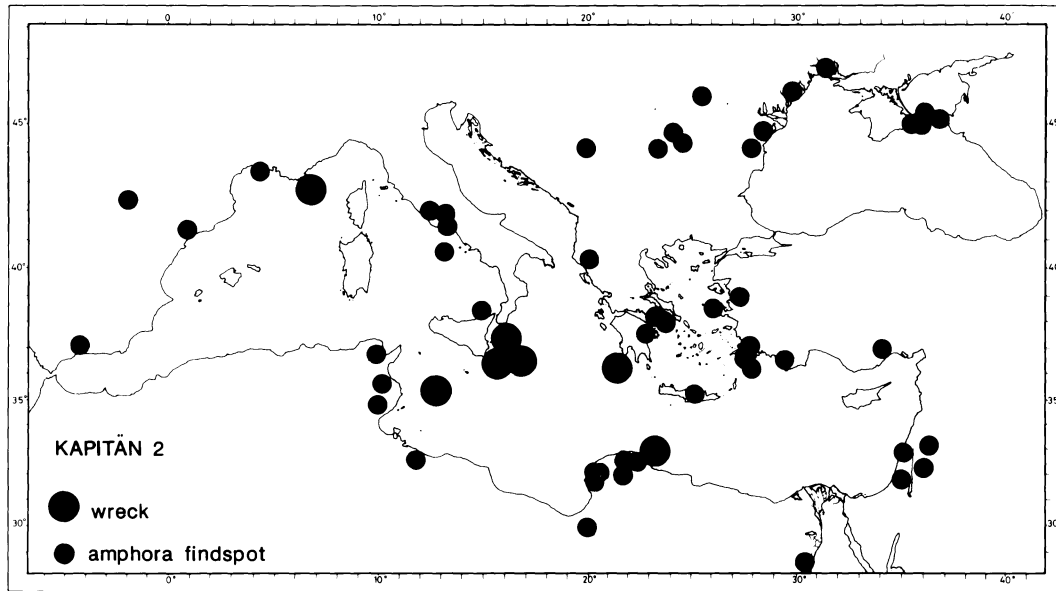


Fig. 13 Kapitän 2 amphoras and wrecks

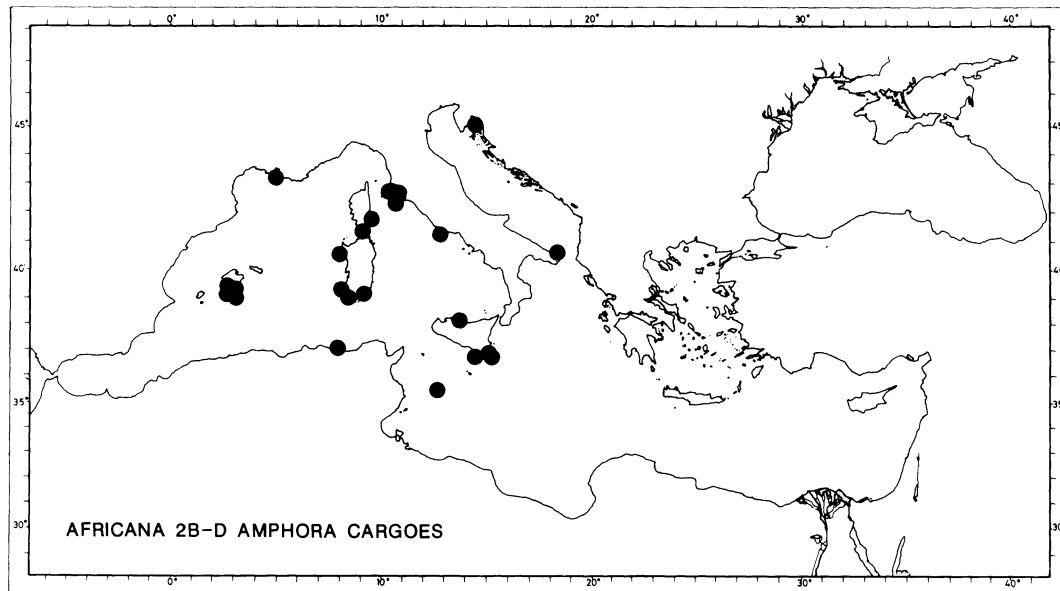


Fig. 14 Africana 2B-D amphora cargoes



## Amphoras

### Figure 15

- |                  |                             |
|------------------|-----------------------------|
| 1. Persian       | Zemer, 1977: no. 19         |
| 2. Loop-handle   | Zemer, 1977: no. 24         |
| 3. Etruscan      | Joncheray, 1976a: 16, no. 2 |
| 4. Punic: Mañá A | Pascual, 1974               |
| 5. Punic: Mañá B | "                           |
| 6. Punic: Mañá D | "                           |
| 7. Punic: Mañá E | "                           |

### Figure 16

- |                                |                                       |
|--------------------------------|---------------------------------------|
| 1. Massiliot                   | Carrazé, 1972a: 82                    |
| 2. Coan                        | Weinberg <i>et al.</i> , 1965: fig. 1 |
| 3. Corinthian B                | Koehler, 1978: 233, c                 |
| 4. Corinthian A                | Koehler, 1978: 232, d                 |
| 5. Graeco-Italic: Will type A  | Cerdá, 1979a                          |
| 6. Graeco-Italic: cf. Will D/E | Liou, 1975: fig. 14                   |
| 7. Dr. 1, Entremont type       | Cerdá, 1980: 70                       |
| 8. Rhodian                     | Riley, 1979: fig. 69 no. 16           |

### Figure 17

- |                              |                              |
|------------------------------|------------------------------|
| 1. Ovoidal (Dr. 26)          | Liou & Pomey, 1985: fig. 19  |
| 2. Ovoidal (cf. Lamboglia 2) | Carrazé, 1976a: 69           |
| 3. Dr. 2-4 (Campanian type)  | Panella & Fano, 1977: type 1 |
| 4. Dr. 2-4 (Spanish type)    | Panella, 1974: no. 5         |
| 5. Dr. 2-4 (Greek (?) type)  | Panella & Fano, 1977: type 6 |
| 6. Dr. 9                     | Joncheray, 1974b:            |
| 7. Dr. 17                    | Bebko, 1971                  |
| 8. Ibiza                     | Llabrés, 1975                |

### Figure 18

- |                                   |                              |
|-----------------------------------|------------------------------|
| 1. Riley MR 4 (Panella 34)        | Panella, 1974: no. 34        |
| 2. Horn-handled (Riley no. D 108) | Riley, 1979: fig. 73 no. 108 |
| 3. Kingsholm 117                  | Hurst, 1985: fig. 28         |
| 4. Mauretanian                    | Riley, 1979: fig. 85 no. 251 |
| 5. Almagro 51A                    | Joncheray, 1977: fig. 4      |
| 6. Beltrán 72                     | Llabrés, 1976                |
| 7. Late Roman cylindrical         |                              |
| 8. LR cylindrical, FM type        | Llabrés, 1976                |

### Figure 19

- |            |            |
|------------|------------|
| 1. Keay 25 | Keay, 1984 |
| 2. Keay 35 | Keay, 1984 |
| 3. Keay 62 | Keay, 1984 |

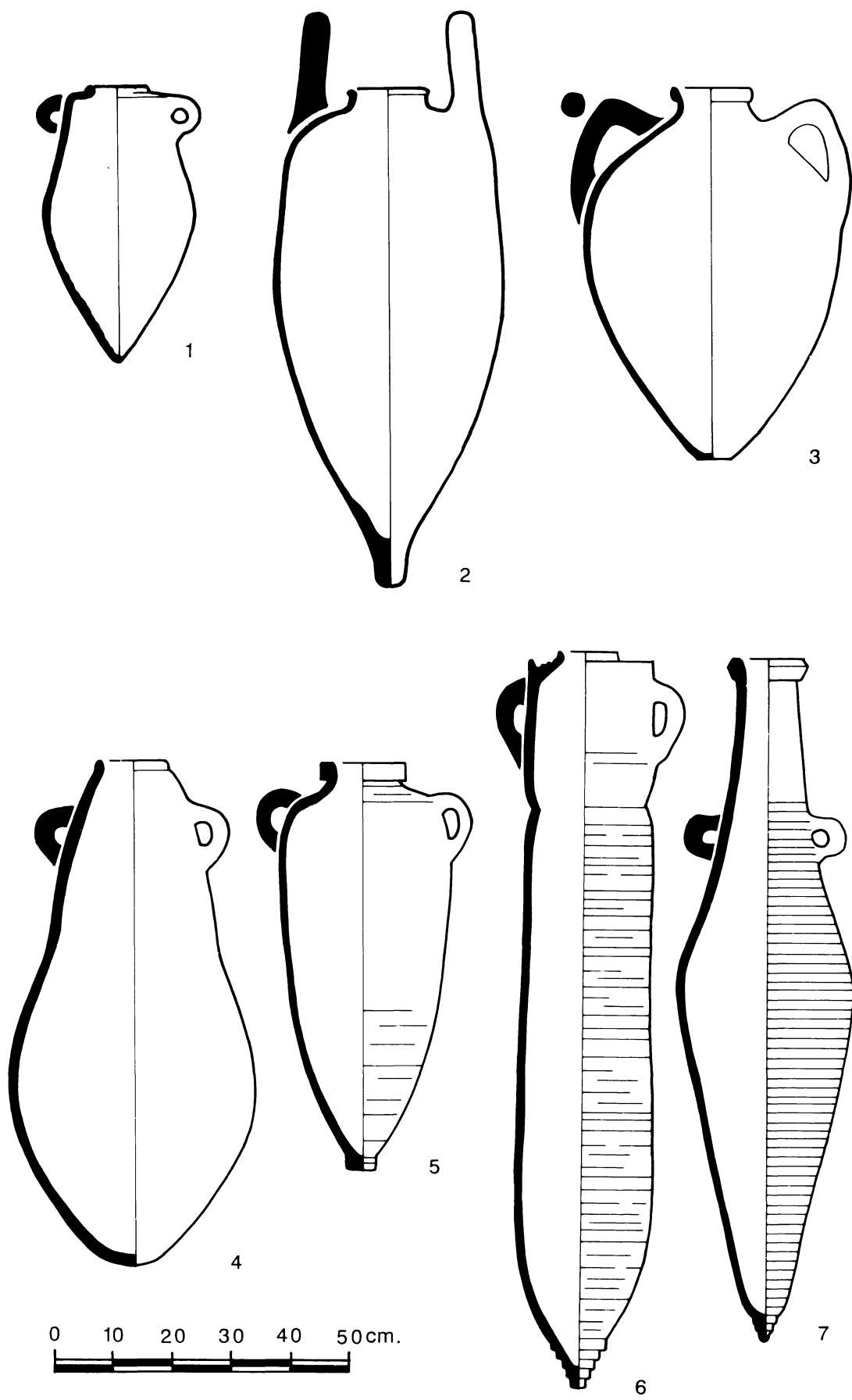


Fig.15 Amphora types (1)

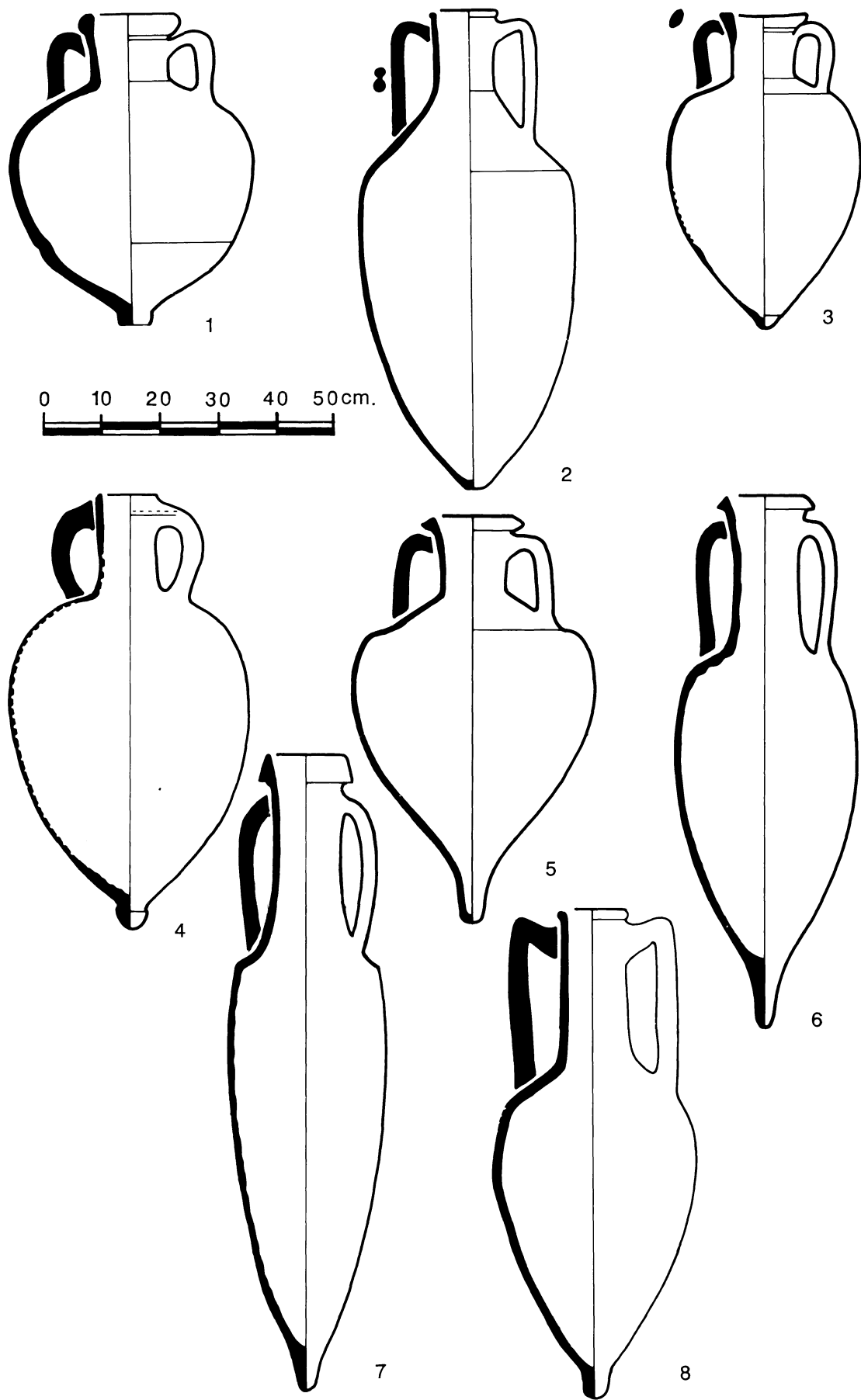


Fig. 16 Amphora types (2)

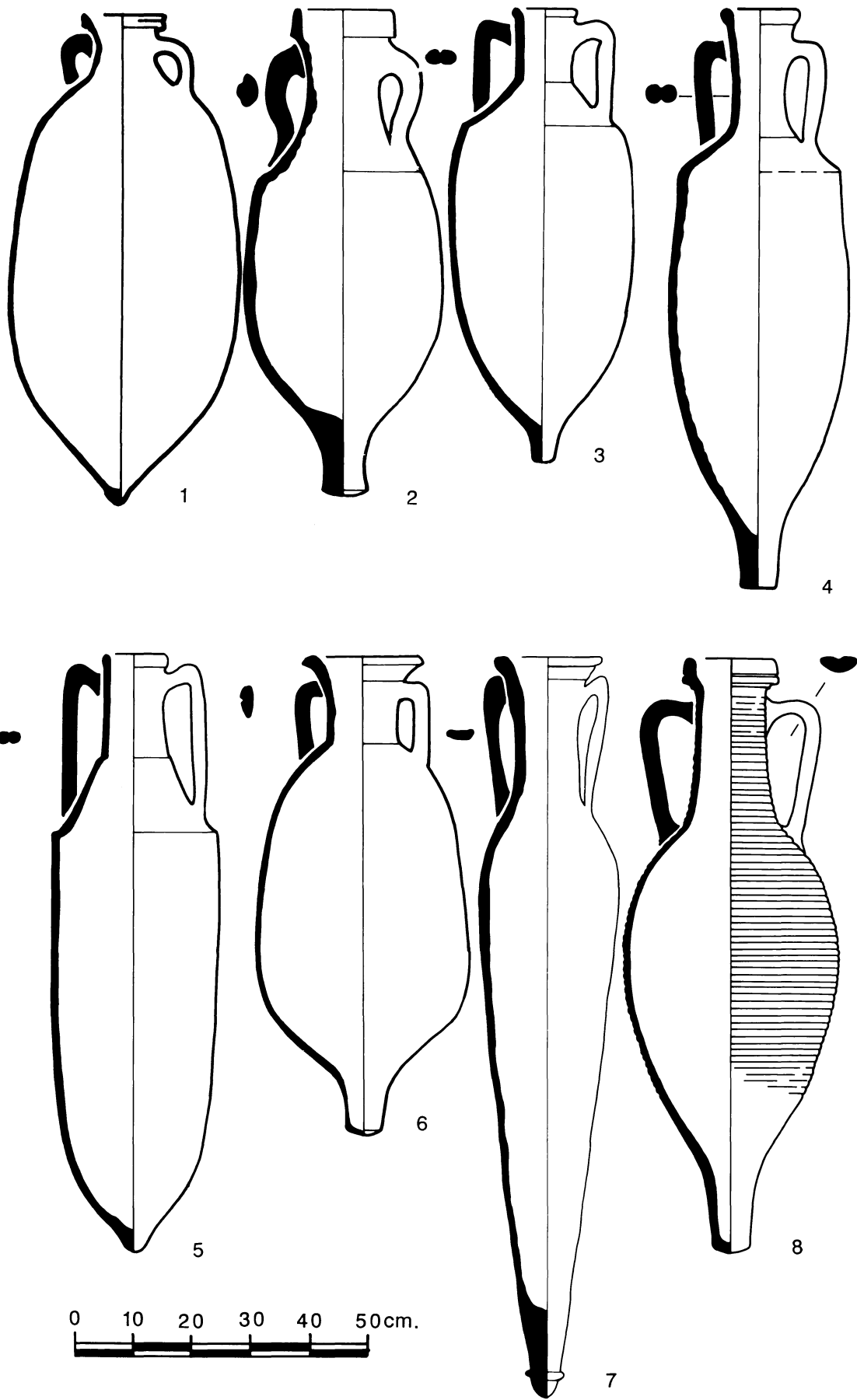


Fig. 17 Amphora types (3)

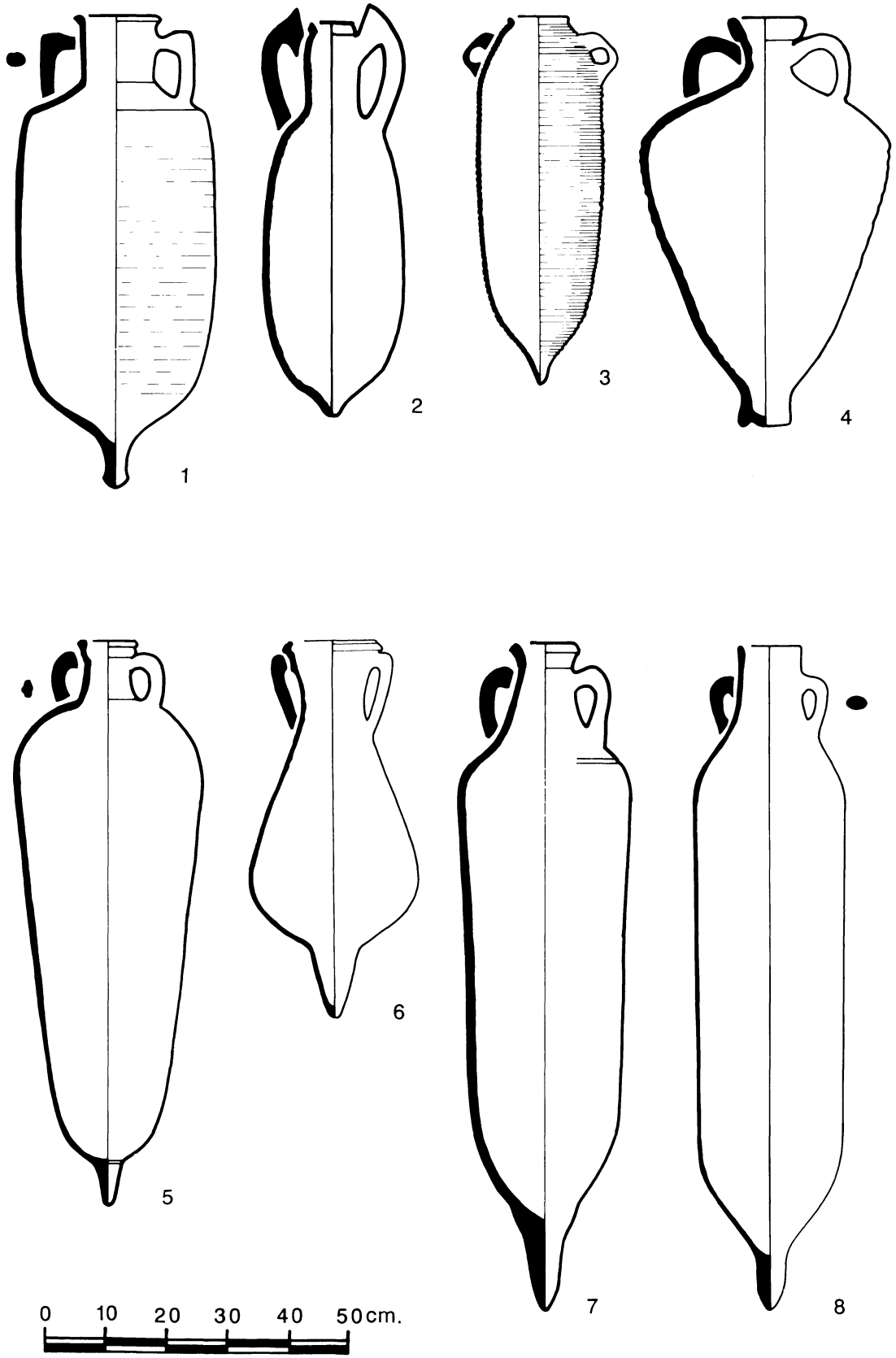


Fig. 18 Amphora types (4)

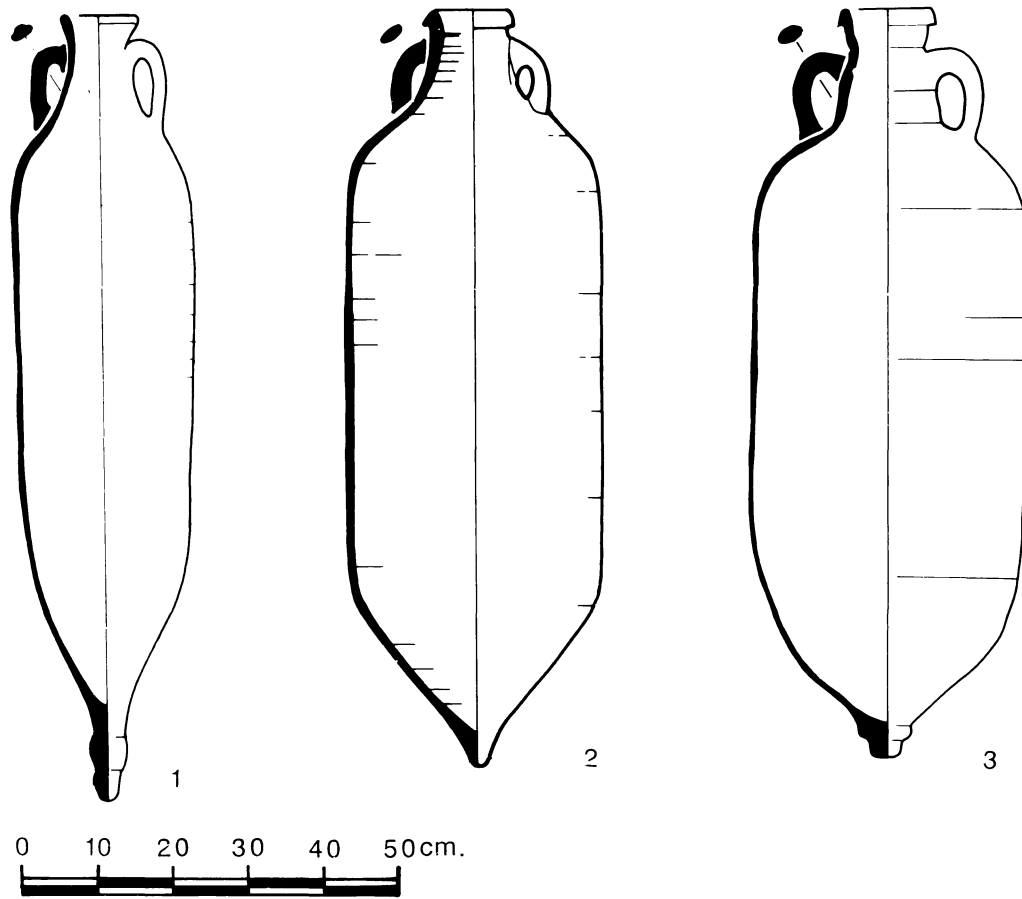
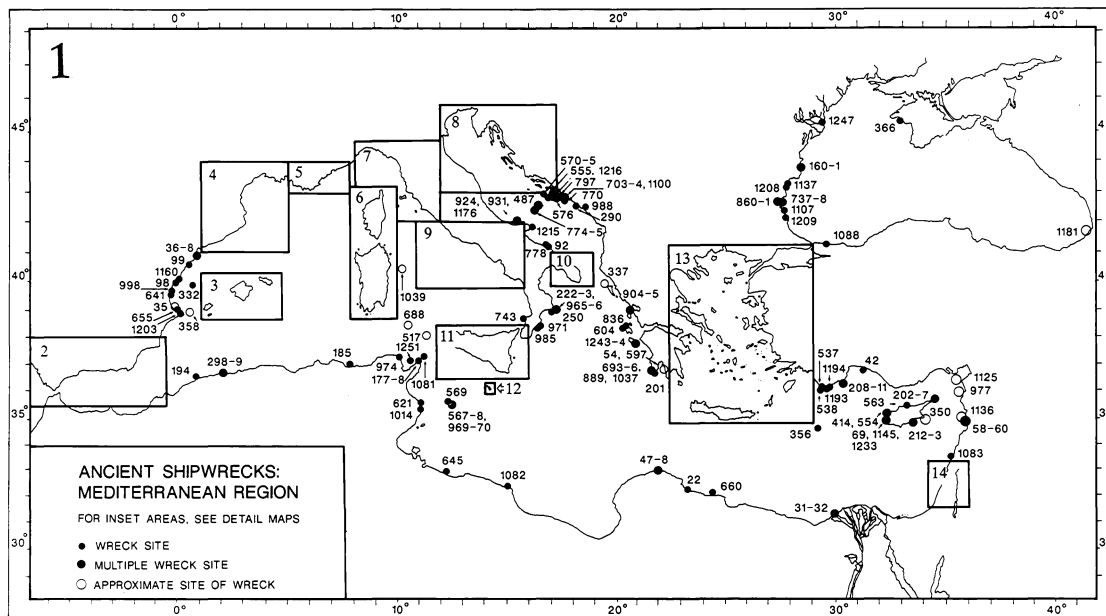
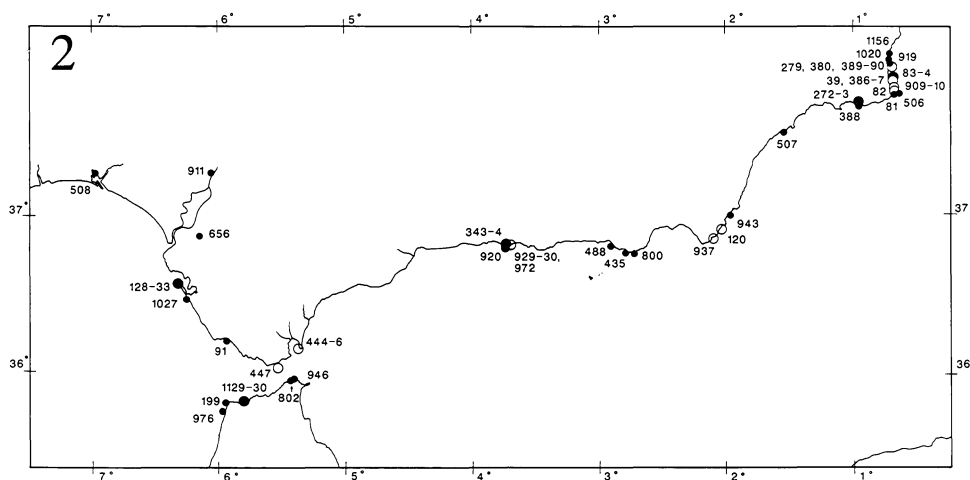


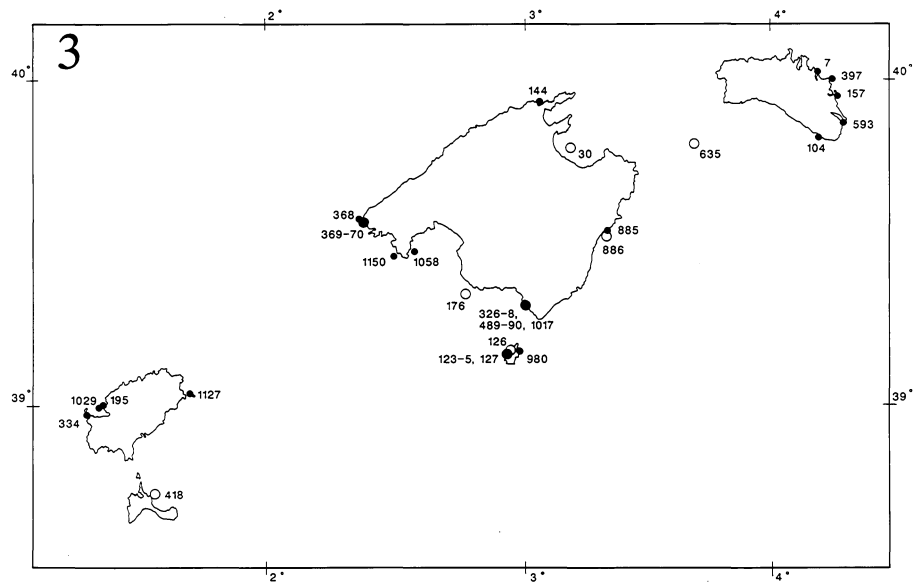
Fig. 19 Amphora types (5)



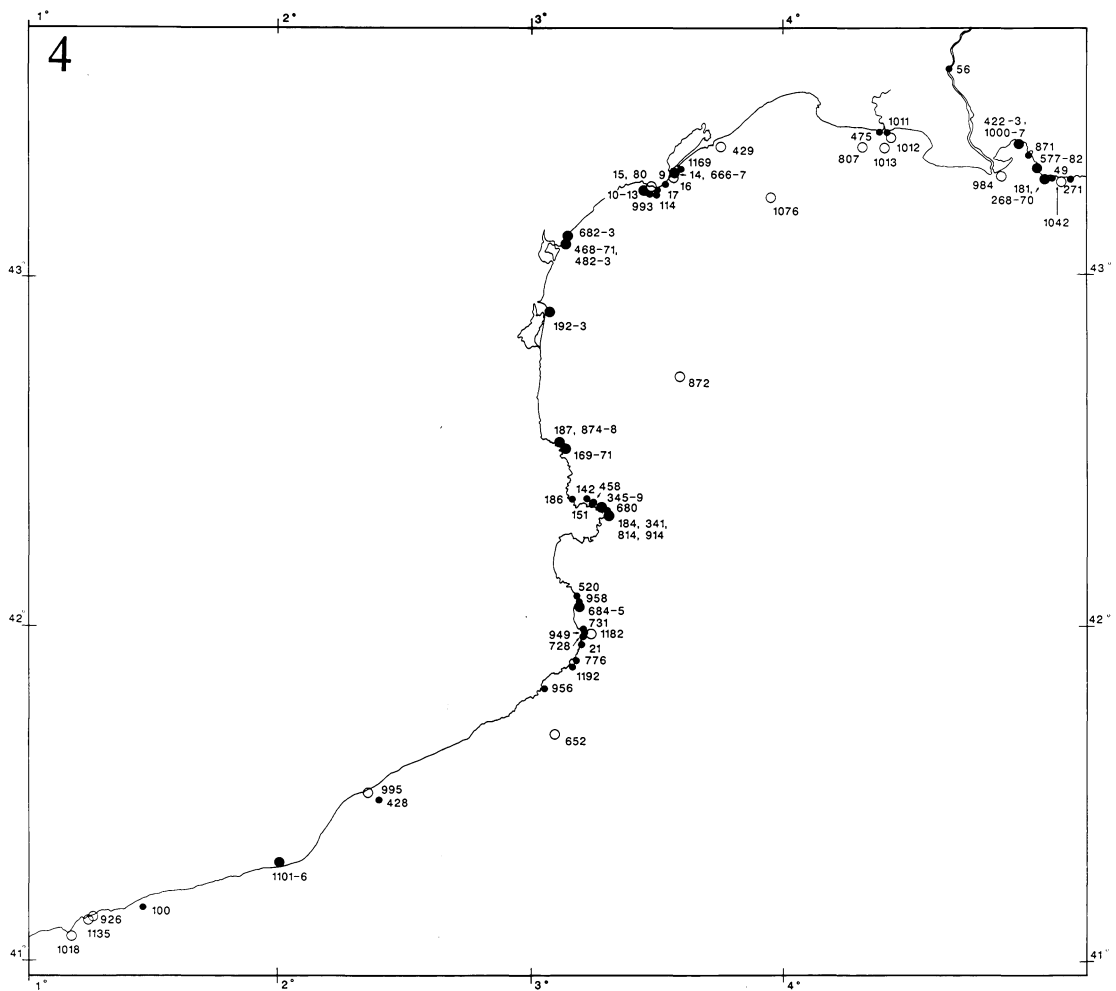
1 Ancient shipwrecks: Mediterranean region



2 Southern Spain and the Straits of Gibraltar

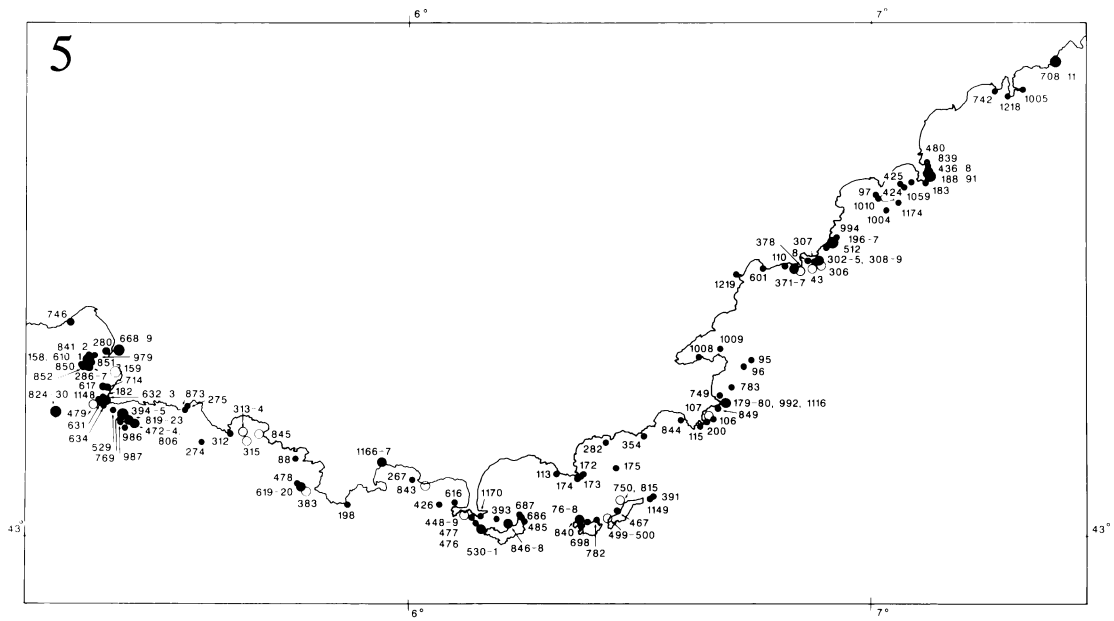


3 The Balearic Isles

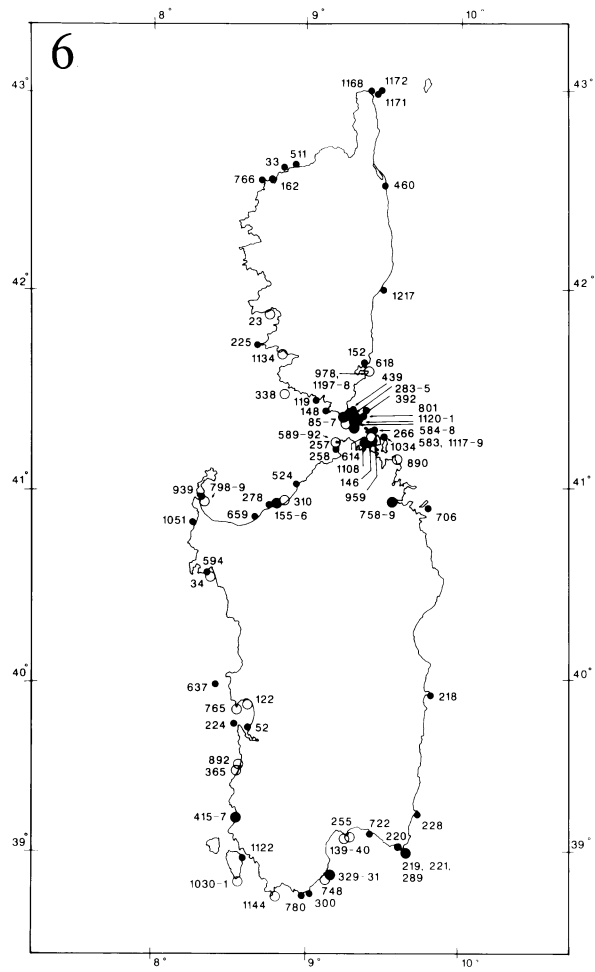


4 North-East Spain and South-West France

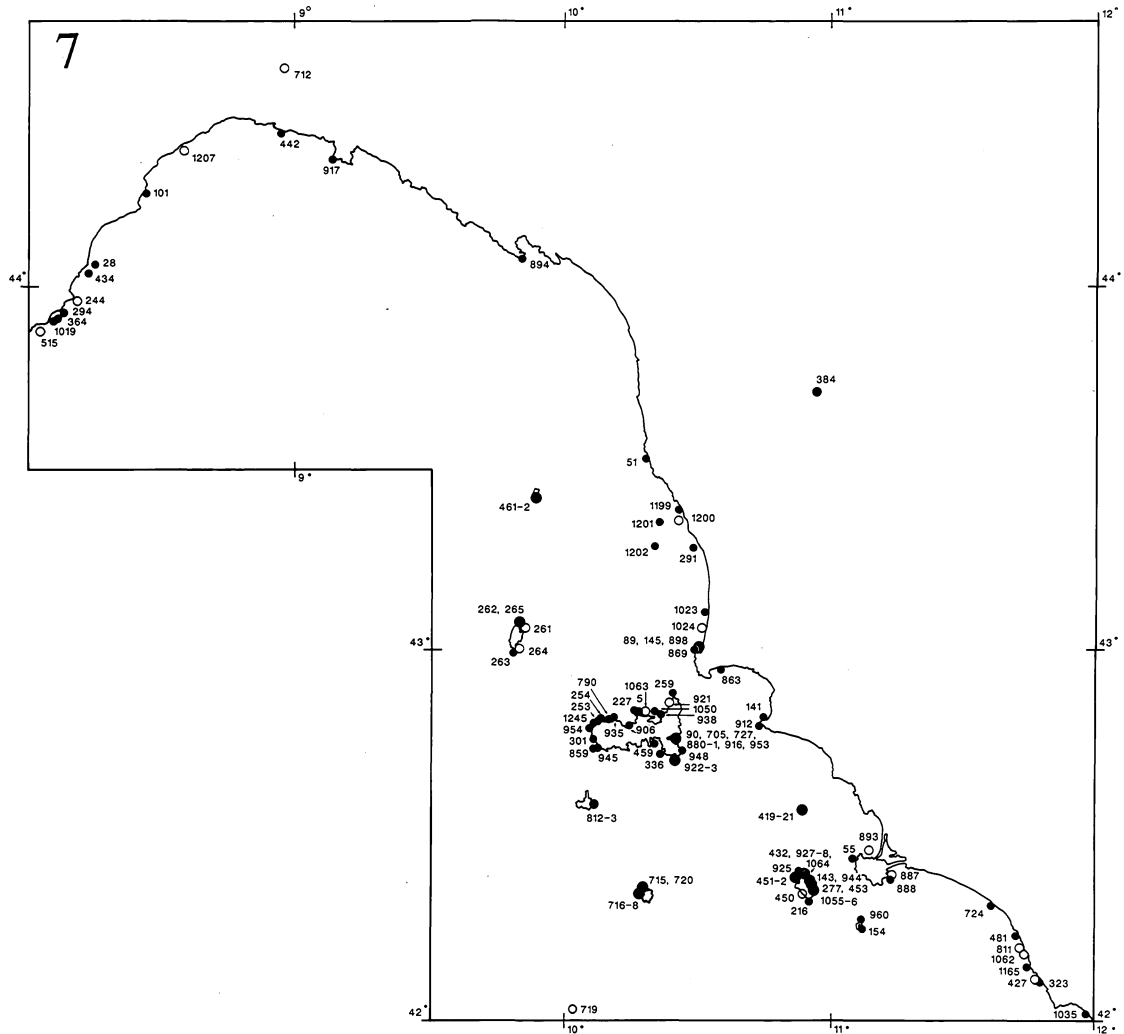




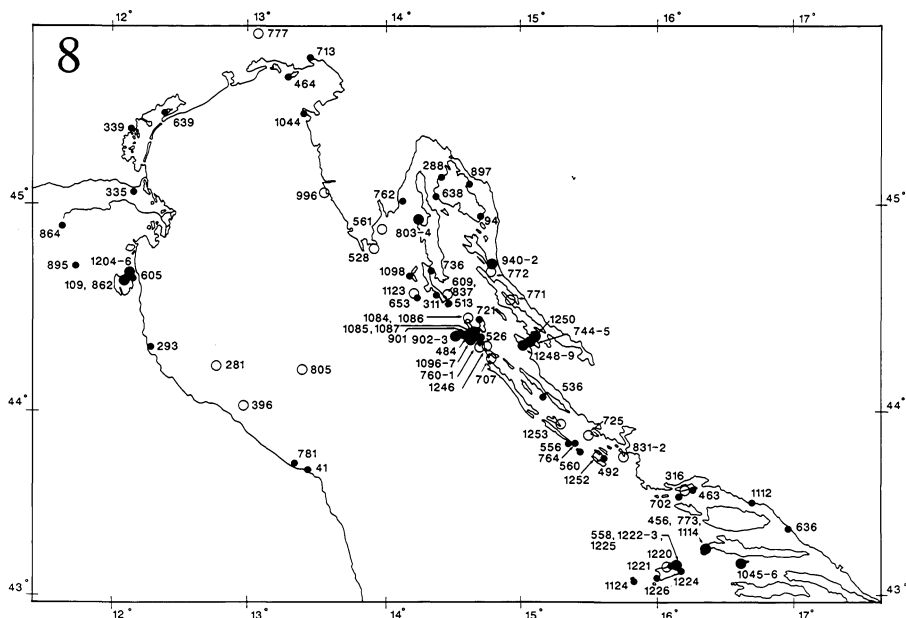
5 Southern France



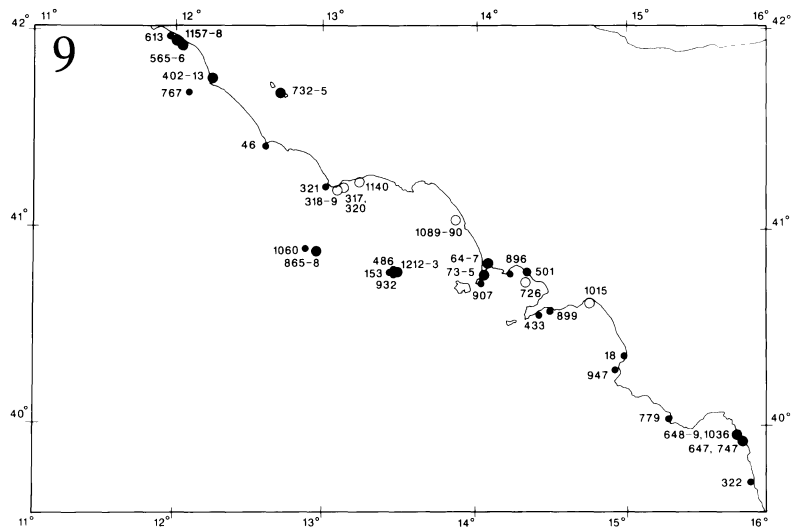
6 Corsica and Sardinia



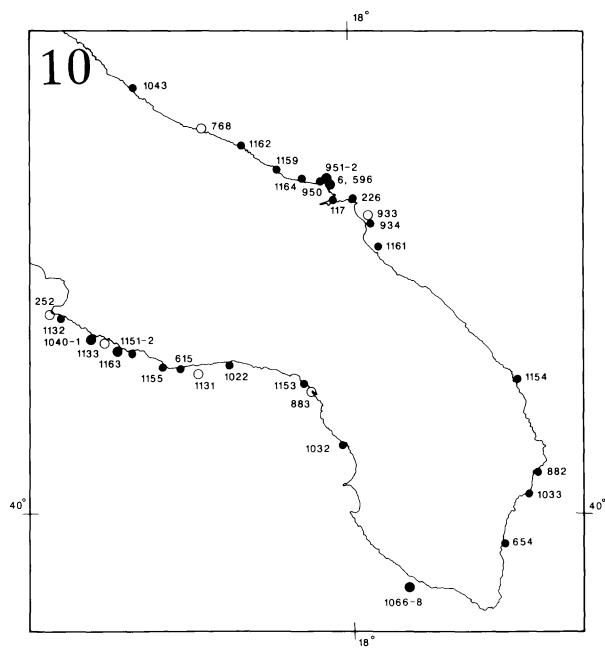
7 North-West Italy



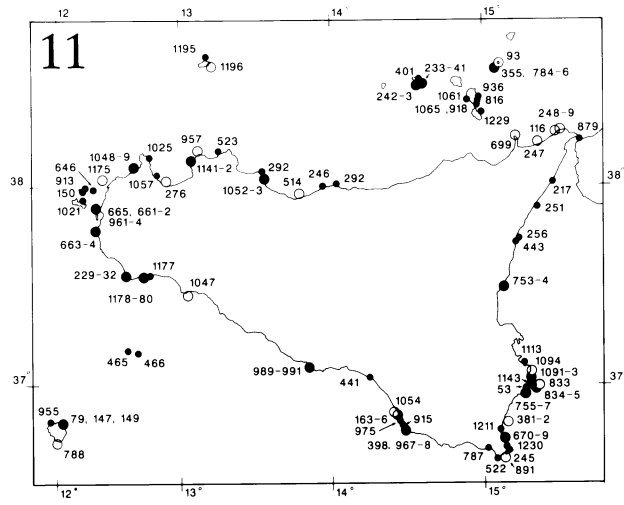
8 The Northern Adriatic



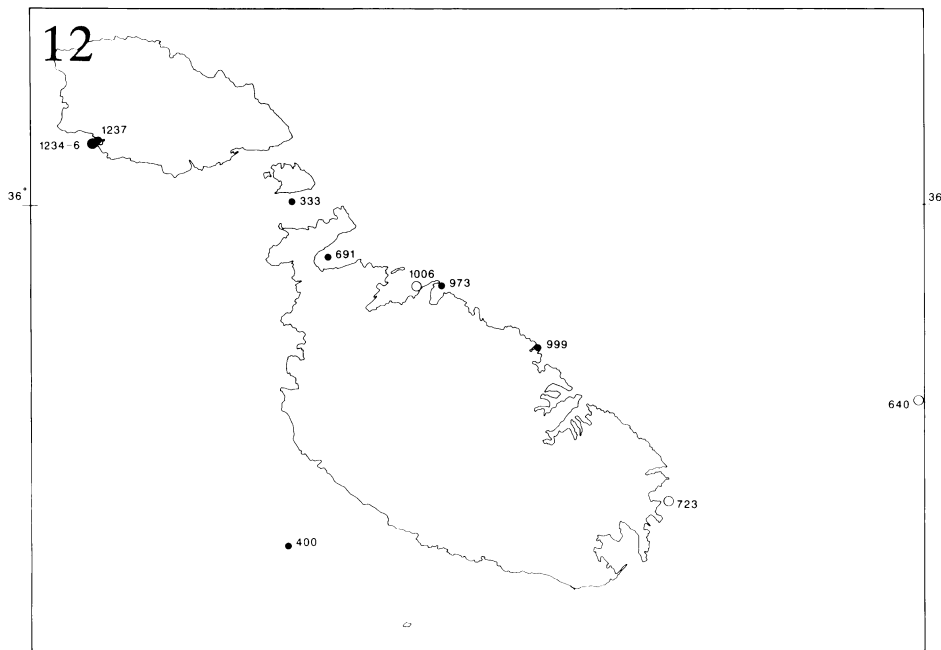
9 Central Italy



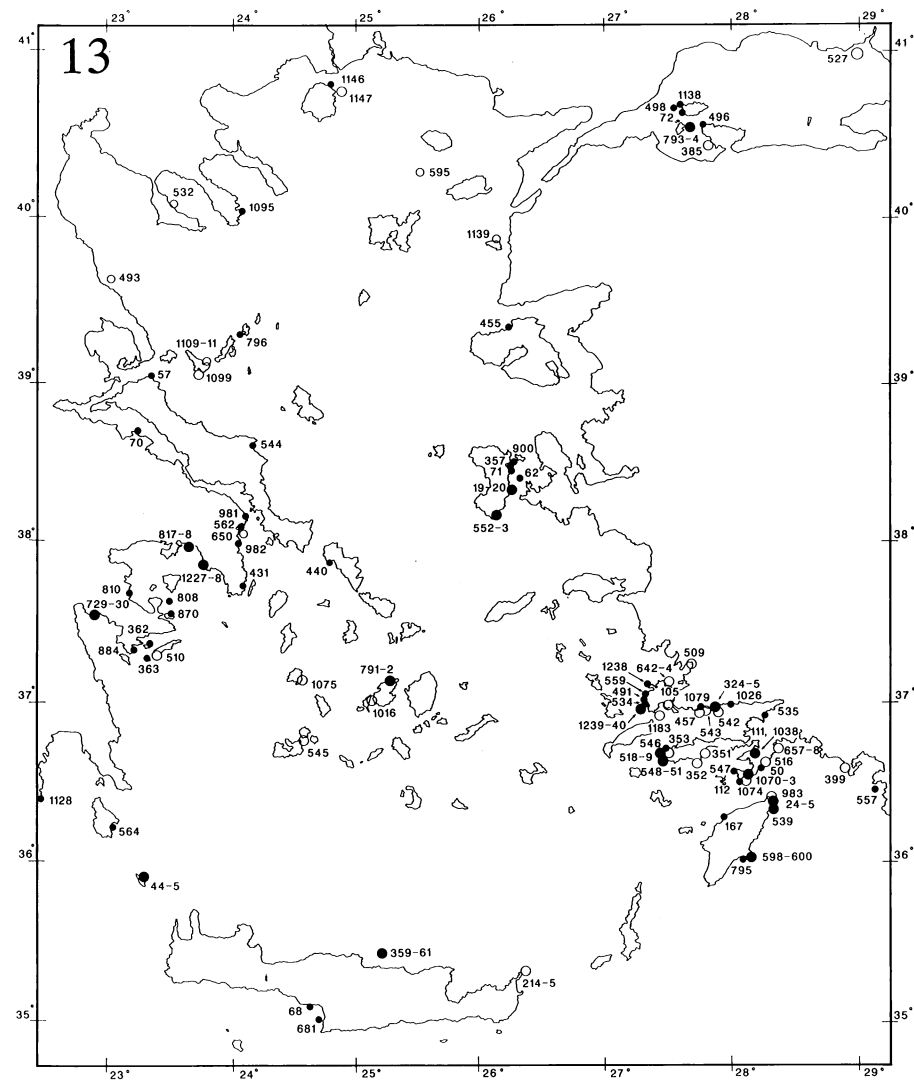
10 South-Eastern Italy



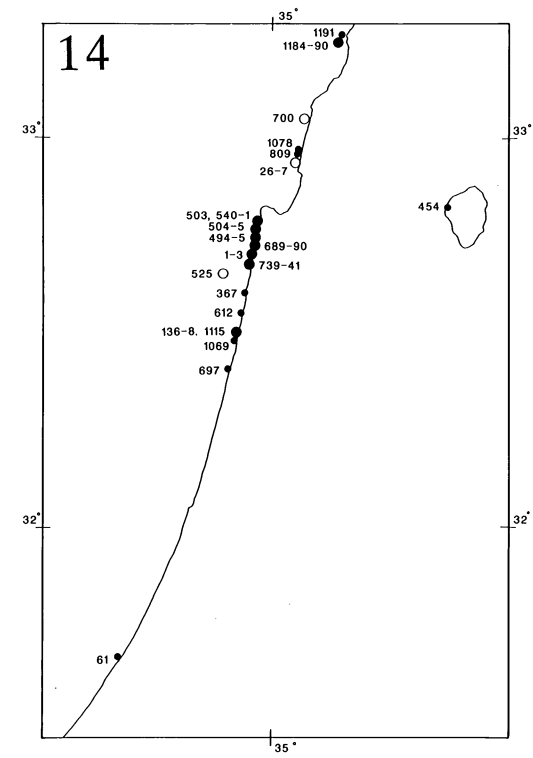
11 Sicily



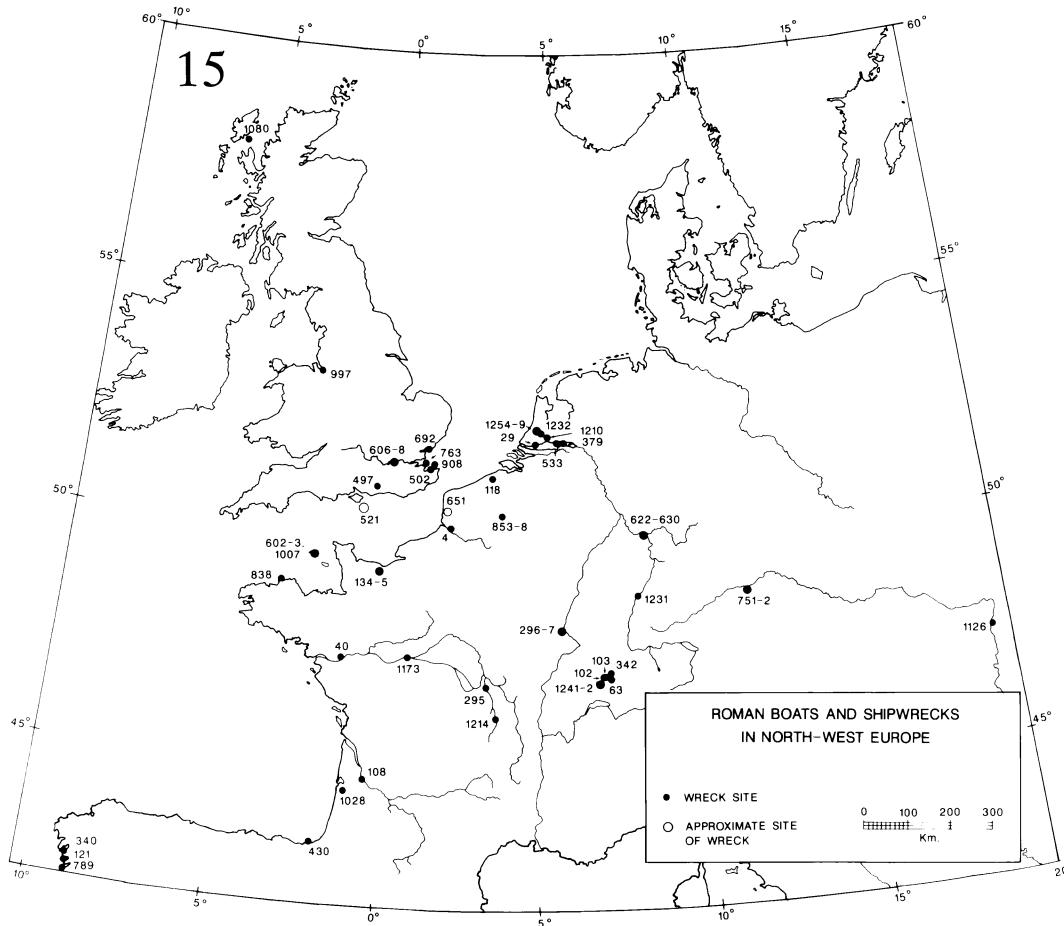
12 Malta



13 The Aegean



14 Israel and Lebanon



15 Roman boats and shipwrecks in North-West Europe

