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# Maritime Archaeology and Ancient Trade in the Mediterranean



Edited by Damian Robinson and Andrew Wilson

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## 8: *Lapis transmarinus*: stone-carrying ships and the maritime distribution of stone in the Roman empire

Ben Russell

*Mountains were made by Nature to serve as a framework for the earth . . . and yet we quarry these mountains and haul them away for a mere whim . . . Headlands are laid open to the sea, and nature is flattened. We remove the barriers created to serve as the boundaries of nations, and ships are built specially for marbles. And so, over the waves of the sea, Nature's wildest element, mountain ranges are transported to and fro . . . When we hear of the prices paid for these vessels, when we see the masses of marble that are being conveyed or hauled, we should each of us reflect, and at the same time think how much more happily many people live without them.*

Pliny the Elder *Naturalis Historia* 36.1

So Pliny begins his book on stone. By the time he was writing, of course, the long-distance movement of stone in colossal quantities was old news; it had its origin, so he himself tells us, in the second century BC. But this was a fashion yet to reach its peak and one which would continue well into Late Antiquity.<sup>1</sup> To meet this demand, more marble was quarried in the Roman Imperial period than in any other era prior to the twentieth century.<sup>2</sup> Though local stone supplied most needs, high-quality or coloured material often had to be imported, often from far away. Furthermore, the bulk of stone that was moved long distances in this period was transported by sea. Indeed, overseas travel, exoticism and prestige became intimately linked. The famous testament of Sestus Iulius Aquila, from the territory of Langres in central Germania Superior (about as far from the sea as any point in the Roman Empire), makes this point explicit: for the carved details of his tomb only the finest imported stone, *lapis transmarinus*, specifically from Luna (modern Carrara), was to be used.<sup>3</sup> So omnipresent was the ideology of imported stone that in succeeding centuries it became intertwined with the symbolism of Roman power itself in both the Christian and Islamic worlds.<sup>4</sup>

In seeking to explain the distributive mechanisms that fed this demand, scholarly attention has tended to focus on shipwrecks, particularly those of a handful of large, apparently specialised, stone-carriers. Maischberger maps the wrecks of 28 such ships in his work on the topography of the marble yards at Rome; Bernard refers to 25 in her analysis of the Porto Nuovo wreck; and Pensabene mentions 20 in his general discussion of shipwreck evidence.<sup>5</sup> All of these ships were large: none of the reconstructable cargoes of the ships referred to appears to weigh less than 90 tonnes—according to Parker's classifications, ships of 'medium' and 'large' size.<sup>6</sup> Considering Pliny's description of the ships used to carry marble, this focus on the largest wrecks is unsurprising.

There are, however, more wrecks that need to be considered and it is the purpose of this paper to draw attention to them. Though not neglected in studies of the ancient trade in stone, the full potential of shipwreck evidence has not been realised. Only Strauss has attempted to catalogue, in one place, all of the evidence for shipwrecks containing marble.<sup>7</sup> The handful of shipwrecks on which most scholars have focused typifies one level of activity, but any comprehensive model of the maritime distribution of stone in this period has to take account of the variety of other processes, often less spectacular, taking place contemporaneously. Cargoes of other stone types also need to be considered; this paper is concerned with the movement of all stone, not just marble. As John Ward-Perkins put it, 'a great deal of misunderstanding would be avoided if scholars would cease trying to squeeze into a single mould what must often have been a very wide diversity of individual practices'.<sup>8</sup>

### Geographical distribution

The sample of 73 probable wrecks discussed in this paper is, of course, not definitive (see Table 8.1 and Figure 8.1); many others are known about but remain unpublished.<sup>9</sup> In a letter to Ward-Perkins, dated to January 1964, and now preserved

1 For a general overview of the history of stone-use in the Roman period, see Pensabene 2002: 3–4.  
2 On this point, see Fant 1993: 146–47; Jongman 2007: 592.  
3 *CIL* XIII: 5708.  
4 On the use and ideology of ancient marbles in Medieval Europe and the Islamic world, see Greenhalgh 2008.  
5 Maischberger 1997: 27, fig. 2; Bernard *et al.* 1998: 54–5; Pensabene 2002: 34–42.

6 Parker 1992b: 89.  
7 Strauss 2007.  
8 Ward-Perkins 1980: 24.  
9 Parker (1992a: 6–7) makes the point that although his survey of known ancient wrecks in Greek territorial waters includes only 84 examples, the Department of Underwater Antiquities supposedly has more than 1,000 sites on record.

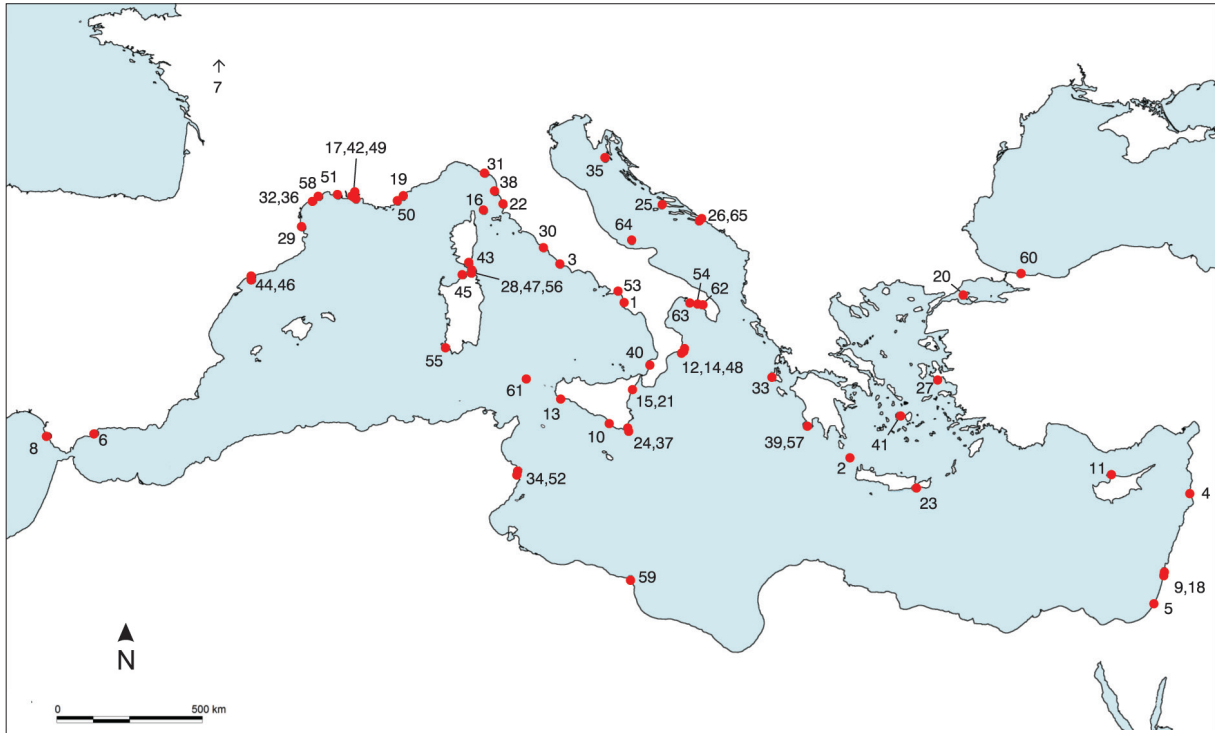


**Table 8.1.** Shipwrecks with cargoes containing stone objects datable between the second century BC and the seventh century AD.

Wrecksite	Date	Cargo	Tonnage	Reference
Agropoli	Roman	Marble (?) blocks	?	Gianfrotta 1981
Antikythera A	80–70 BC	Marble statues, amphorae, and other objects	?	Throckmorton 1970; Bol 1972
Anzio	Roman	Tuff blocks	?	Gianfrotta and Pomey 1981
Arwad C	Roman	Small basalt columns	?	Frost 1964
Ashqelon	AD 175–300	Stone (?) blocks and a porphyry statue	<10	Arata 2005
Benalmadena	Roman Imperial	Marble statue and veneer	<1	Arata 2005
Blackfriars 1	AD 130–175	Limestone blocks	<10	Marsden 1967
Cádiz E	Roman Imperial	Stone (?) blocks	<10	Vallespín Gómez 1985
Caesarea 1	AD 240–270	Marble slabs	<10	Raban 1989 and 1992b
Caesarea 2	AD 175–300	Stone (?) blocks and Prokonnesian sarcophagi	<10	Raban 1992a
Camarina A	AD 175–200	<i>Giallo antico</i> columns and sandstone blocks	<50	Di Stefano 1991; Parker 1992a
Cape Crommyon	Roman Imperial	Stone (?) blocks	?	Megaw 1959
Capo Cimiti	Roman	Cipollino columns	100	De Franciscis and Roghi 1961; Pensabene 1978
Capo Granitola A	AD 225–275	Prokonnesian blocks	350	Gianfrotta and Pomey 1981; Purpura 1987
Capo Granitola D	AD 250–350	Architectural elements in eastern (?) marble	<10	Purpura 1987
Capo Rizzuto	AD 200–300	Asiatic sarcophagus (Dokimeian marble)	<10	Arata 2005
Capo Taormina	Roman	Marble (?) columns and blocks	100	Kapitän 1961
Capraia C	Roman	Marble statues	<10	Arata 2005
Capraia D	Roman	Stone (?) blocks	?	Gianfrotta 1981; Arata 2005
Carry-le-Rouet	125–75 BC	Limestone blocks	24	Kainic 1986; Long 1985
Dor 2001/1	AD 500–700	Sandstone blocks	<10	Kahanov and Mor 2006
Dramont I	AD 50–75	<i>Africano</i> blocks	23	Joncheray and Joncheray 1997; Joncheray 1998
Ekinlik Adası	AD 500–600	Prokonnesian columns and blocks	?	Günsenin 1997
Giardini Naxos	AD 200–300	<i>Cipollino</i> columns and blocks of eastern (?) marble	95	Basile 1988
Golfo di Baratti B	AD 100–300	Marble statue	<1	Arata 2005
Hierapetra	AD 100–300	Attic sarcophagus (Pentelic marble)	<10	Arata 2005
Isola delle Correnti	AD 280–350	Prokonnesian blocks and fragment of architectural element	350	Kapitän 1961
Izmetište	AD 100–150	Limestone and granite blocks and roof tiles	?	Vrsalović 1974
Jakljan Island	AD 150–300	Limestone sarcophagi and lids	<10	Jurišić 2000
Kizilburun	150–1 BC	Prokonnesian column drums, capital, blocks, and other objects	75	Carlson 2007
La Maddalena	AD 200–320	Marble veneer panels	<10	D'Oriana and Riccardi 1992
La Mirande (Port-Vendres 5)	AD 1–20	Amphorae and marble veneer panels	<1	Descamps 1992
Ladispoli B	AD 40–100	Marble (?) columns	?	Gianfrotta 1981
Lerici	Roman Imperial	Luna column drum	<10	Dolci 2006
Les Riches Dunes 5	AD 150–200	Block, veneer, column and base in various white marbles	<10	Bernard and Jézégou 2003
Lixouri	Roman Imperial	Statues and architectural elements in eastern (?) marble	<10	Touchais 1981
Mahdia	110–90 BC	Pentelic columns, bases, capitals, basins and statues	250	Fuchs 1963; Gagsteiger and Woehl 1993; Hellenkemper-Salies <i>et al.</i> 1994

## 8: Lapis transmarinus

Wrecksite	Date	Cargo	Tonnage	Reference
Margarina	Roman Imperial	Marble (?) blocks and columns	?	Vrsalović 1974; Jurišić 2000
Marseillan Beauséjour	AD 50–100	Blocks of Luna marble	24	Bernard 2009
Marzamemi A	AD 200–250	Blocks of Pentelic marble	172	Kapitän 1961; Parker 1981
Marzamemi B	AD 500–540	Components of a small Justinianic basilica in Prokonnesian and <i>verde antico</i>	?	Kapitän 1961
Marzamemi C	Roman Imperial	Aswan granite columns	<50	Kapitän 1961
Meloria C	AD 30–160	Blocks and column in Luna marble	50	Bargagliotti <i>et al.</i> 1997
Methone C	AD 200–250	Columns in eastern (?) granite	130	Throckmorton and Bullitt 1963
Methone D	AD 150–250	Assos sarcophagi with lids	<50	Papathanasopoulos 1963; Throckmorton and Bullitt 1963
Nicotera	50–1 BC	Granite blocks	?	Parker 1992a
Paros	AD 100–200	Various objects in Parian marble	?	Papathanasopoulos and Schilardi 1981
Port-de-Bouc	150–50 BC	Marble (?) capital and sarcophagus	<10	Benoit 1952; Diolé 1954
Porto Nuovo	AD 27–100	Columns and blocks in Luna, and assorted veneer panels	138	Mazeran 1998; Bernard <i>et al.</i> 1998
Punta de la Mora	AD 150–250	Attic sarcophagus (Pentelic marble)	<10	Arata 2005
Punta del Francese	AD 30–100	Marble (?) blocks	270	Galasso 1997
Punta del Milagro	Roman	Stone (?) column drums	?	Ripoll Perelló 1961
Punta Sardegna	Roman Imperial	Stone (?) columns	?	Boninu 1987
Punta Scifo A	AD 190–210	Columns, basins, blocks, capitals, bases and statue in Prokonnesian and <i>pavonazzetto</i>	300	Pensabene 1978
Rhône Delta	31–10 BC	Head of Augustus in Luna and granite blocks	<10	Brentchaloff and Salvat 1989
Saint Tropez A	AD 100–200	Columns drums, bases, veneer, and architrave in Luna marble	230	Perret 1956; Gianfrotta 1981; Diolé 1954
Saintes-Maries 18	Roman Imperial	Luna blocks	30–40	Long 1999
Saintes-Maries 21	Roman Imperial	Luna blocks	30–40	Long 1999
Saintes-Maries 22	AD 1–200	Luna blocks	30–40	Long 1999
Salakta	AD 192–220	Marble (?) blocks, architrave, and pilaster	?	Parker 1992a
Salerno	Roman	Tuff blocks	?	Gianfrotta and Pomey 1981
San Pietro	AD 200–250	Sarcophagi in Thasian marble	150	Ward-Perkins and Throckmorton 1965
Sant'Antioco B	Roman	Stone (?) blocks	?	Zara 1984
Santa Maria	AD 200–300	Marble (?) blocks and veneer	<50	Boninu 1987
Sapientza	Roman	Marble (?) blocks	300	Parker 1992a
Sète	Roman	Luna column drum and blocks	<10	Bernard 2009
Sidi Ahmad	Roman Imperial	Marble (?) columns	?	Parker 1992a
Şile	AD 100–125	Columns, capitals, base, blocks, plaque, statue, bust, sarcophagus and stele in Prokonnesian and <i>verde antico</i>	?	Beykan 1988
Skerki Bank F	AD 30–70	Stone (?) blocks and columns	13	McCann 2001
Torre Chianca	AD 230–270	<i>Cipollino</i> columns	?	Borricelli and Zaccaria 1995; Auriemma 1997
Torre Sgarrata	AD 180–205	Sarcophagi in Thasian marble, marble (?) blocks, and assorted veneer	160	Throckmorton 1969 and 1972; Alessio 1995
Tremiti Islands	100 BC–AD 100	Stone (?) blocks	?	Casson 1968
Veliki Školj	Roman Imperial	Limestone basins or sarcophagi with lids	<10	Vrsalović 1974; Jurišić 2000



**Figure 8.1.** Distribution map of the 73 shipwrecks with cargoes containing stone objects datable between the second century BC and the seventh century AD discussed in the text.

**Key to Figures 8.1, 8.2**

1. Agropoli	17. Carry-le-Rouet	34. Mahdia	52. Salakta
2. Antikythera A	18. Dor 2001/1	35. Margarina	53. Salerno
3. Anzio	19. Dramont I	36. Marseillan Beauséjour	54. San Pietro
4. Arwad C	20. Ekinlik Adası	37. Marzamemi A-C	55. Sant'Antioco B
5. Ashqelon	21. Giardini Naxos	38. Meloria C	56. Santa Maria
6. Benalmadena	22. Golfo di Baratti B	39. Methone C & D	57. Sapienza
7. Blackfriars 1	23. Hierapetra	40. Nicotera	58. Sète
8. Cádiz E	24. Isola delle Correnti	41. Paros	59. Sidi Ahmad
9. Caesarea 1 & 2	25. Izmetište	42. Port-de-Bouc	60. Şile
10. Camarina A	26. Jakljan Island	43. Porto Nuovo	61. Skerki Bank F
11. Cape Crommyon	27. Kizilburun	44. Punta de la Mora	62. Torre Chianca
12. Capo Cimiti	28. La Maddalena	45. Punta del Francese	63. Torre Sgarrata
13. Capo Granitola A & D	29. La Mirande Port-Vendres 5)	46. Punta del Milagro	64. Tremiti Islands
14. Capo Rizzuto	30. Ladispoli B	47. Punta Sardegna	65. Veliki Školj
15. Capo Taormina	31. Lerici	48. Punta Scifo A	
16. Capraia C & D	32. Les Riches Dunes 5	49. Rhône Delta	
	33. Lixouri	50. Saint Tropez A	
		51. Saintes-Maries 18, 21 & 22	

in the archive of the British School at Rome, Throckmorton described one such wreck—a cargo of marble columns just off Marmara Island (ancient Prokonnesos)—which, he writes, 'I have known about for years but have not been able to survey'.<sup>10</sup> Arata meanwhile refers to a shipwreck with a cargo of stone off Punta Licosa which remains, in his words, 'ancora sostanzialmente inedita'.<sup>11</sup> Even when publications do exist they are often cursory. For the majority of these

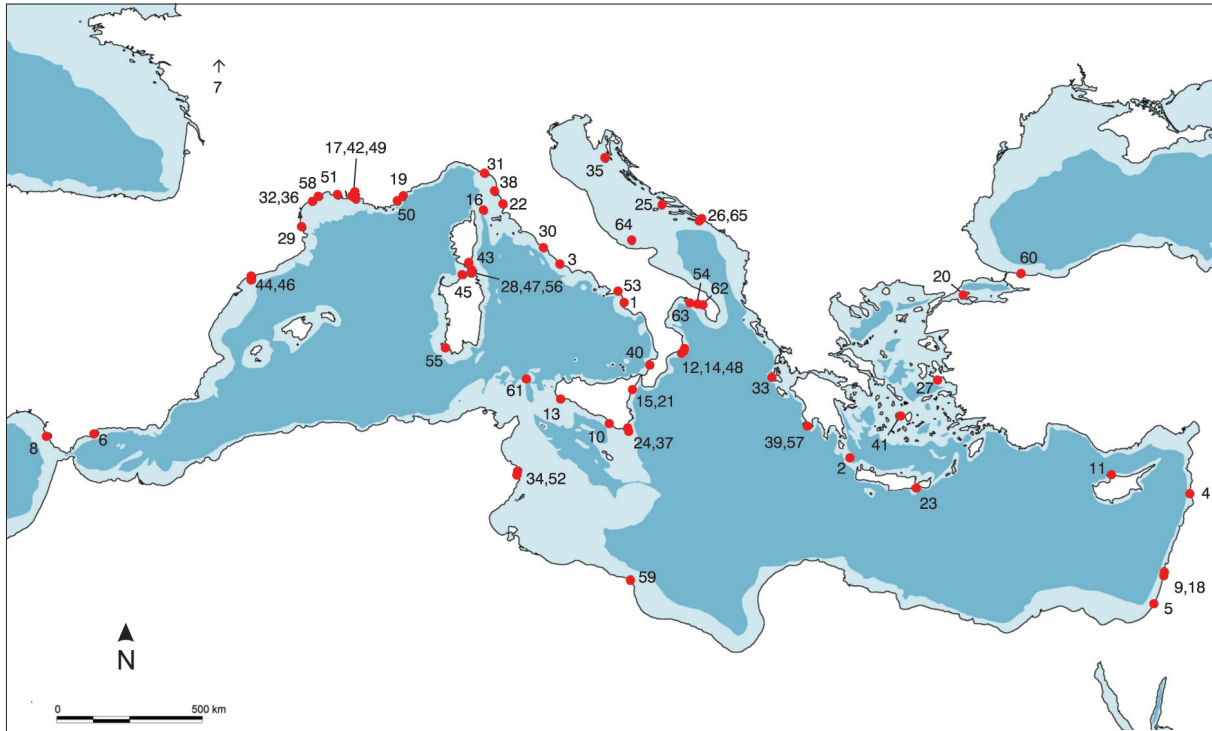
shipwrecks we know little about the size or composition of the cargo, or the origin of the material being transported. For obvious logistical reasons, few of these cargoes have been raised to the surface. This raises an additional issue, which is that it is impossible to say for certain what proportion of the objects in this sample certainly belonged to shipwrecks, as opposed to submerged coastal sites or even jettisoned cargoes.<sup>12</sup> For this reason, a number of stone objects found

10 BSR Archive, WP-1, Box VIII; see also Throckmorton 1972: 75–6. It seems probable that the wreck referred to is the Ekinlik Adası wreck, surveyed in 1996 (see Günsen

1997).

11 Arata 2005: 82.

12 See Wilson (this volume, Chapter Two).



**Figure 8.2.** Location of shipwrecks with cargoes containing stone objects respective to sea depth; the shaded area is over 500 m in depth.

in very shallow waters that appear to have come from submerged villas or other structures have been left out of the sample.<sup>13</sup> Also not included are the newly-discovered wrecks at Punta Scifo and Punta Cicala, off Calabria, which Bartoli is in the process of publishing.

How representative these shipwrecks are of ancient shipping patterns is, of course, impossible to say. Since its location and size are the dominant factors determining the likelihood of a wreck's discovery, there is a danger that the shipwreck evidence overemphasises coastal travel and the relative proportion of larger vessels (see Figure 8.2).<sup>14</sup> At the same time, since the longer a ship spends at sea the more likely it is to sink, shipwrecks give us a better view of long-distance traffic than they do of more localised movements. The effect of varying national traditions of underwater exploration also helps to explain the low number of wrecks identified in the Aegean compared to southern France or Italy. The extent and detail of our sample, therefore, is highly shaped by post-depositional factors.

In addition, it could be argued quite legitimately that the statistical basis for analysis with such a limited sample is fairly weak. Since similar studies have been conducted

in this precise area with samples less than half this size, however, the evidence arguably deserves reconsideration. In fact, some important, albeit tentative, conclusions can be drawn from this small sample; far more could be said, of course, if more of these wrecks were themselves re-examined.<sup>15</sup>

Wrecks of ships carrying stone are found across the Mediterranean, but in especially large numbers around the coasts of southern Italy and Sicily, southern France and around the Straits of Bonifacio (Figure 8.1). The scarcity of stone-carrying wrecks off North Africa and the Levant must result from post-depositional factors, particularly site recovery rates, since it stands in marked contrast to the enormous quantities of imported stone present in the Roman urban centres of both areas.

Much more could be said about the direction of this traffic if we had more detailed data related to the origin of the materials on board, that is the types of stone these ships were carrying. Unfortunately, the precise origin of most of the material being carried is only known for certain in the case of 33 of these shipwrecks; to these may be added a further 10 on which the material being transported may be presumed to be of local

13 Examples include the single statues from Catania Harbour (Tortorici 2002), Grau-du-Roi (Arata 2005), Capo Boeo (Purpura 1987), and Cádiz (Arata 2005), though there is nothing to say for certain that these did not come from shipwrecks.

14 This is especially problematic when one considers that 56

per cent of the Mediterranean is over 900 m in depth (see Houston 1964: 37–8, 43–7).

15 Alessio and Zaccaria's (1997) work on the San Pietro shipwreck has shown how profitable this kind of practical re-examination can be, even for a site considered to be well-known.

origin.<sup>16</sup> Of course, identifying the origin of the material being transported tells us nothing about the port at which it was loaded *per se*. As will be discussed below, several of these cargoes could well have been loaded at intermediary ports or emporia. Nevertheless, an analysis of the materials in these cargoes indicates something of the general direction of this traffic that correlates with the view from on land. Almost all of the ships wrecked off the southern Peloponnese, along the coasts of Puglia and Calabria, and the eastern coast of Sicily for which the stone-type is known were carrying materials originating at quarries in the eastern Mediterranean. In fact, the only wreck off any of the coasts of Sicily that certainly contains material of western origin is the Camarina A ship on which two *giallo antico* columns were found. In contrast, almost all of the ships wrecked in the western Mediterranean, along the French coast and in the Tyrrhenian Sea were carrying white marble from Luna. To date, no stone of certain western origin has been found on a shipwreck in the eastern Mediterranean. Indeed, generally speaking, very little stone from the western Mediterranean appears to have travelled to the eastern Mediterranean at all (the ancient equivalent of taking coals to Newcastle?).

### Chronological distribution

When it comes to dating these wrecks, problems of a different kind arise. Unworked stone is in itself undatable and only 31 of the wrecks in our sample can be roughly dated using ceramic or numismatic evidence.<sup>17</sup> The cargoes of an additional 18 wrecks can be given dates on stylistic or epigraphic grounds, even if these provide only a *terminus post quem* for the date of the wreck.<sup>18</sup> Of these 49 wrecks, however, 9 are not datable to within a specific 100-year period. Of the remaining wrecks, 14 can be dated generally to the 'Roman Imperial period' (31 BC to AD 400, using Parker's system), and 10 to the 'Roman period'

(150 BC to AD 400) through comparison with the datable examples and through analysis of their cargo typology.<sup>19</sup>

When all 73 wrecks are plotted on a graph using the probability-based system developed by Andrew Wilson, a clear peak is visible in the third century AD (Figure 8.3).<sup>20</sup> The validity of this approach can be confirmed by graphing just those 38 wrecks datable to within a century (Figure 8.4). Both graphs show a similar pattern, with the fall in the fourth century AD more obvious after the removal of the long-dated wrecks. This third-century peak is much later than the overall peak in shipwrecks of all ancient periods, placed by Parker in the first century BC and by Wilson in the first century AD, and requires explanation.<sup>21</sup>

Since shipwreck evidence is dominated by amphorae cargoes this discrepancy can be explained on the one hand as resulting from differing patterns of demand for stone objects and amphorae. Demand for imported stone peaked later, especially in the second century AD. The production of sarcophagi in large quantities, for example, only began in the early to mid-second century, not reaching its zenith until the early third century. On the other hand, this third-century peak in shipwrecks must also result from the particular character of the evidence. Very few wrecks carrying Luna marble have been identified along the western Italian coast in comparison to the number found along the southern French coast. This is particularly surprising when one considers that in the first century AD Luna supplied the bulk of Rome's marble needs.<sup>22</sup> The lack of wrecks in this relatively well-explored area must reflect the calmness of these coastal waters rather than the scale of ancient traffic: a lack of wrecks does not equal a lack of ships. Indeed, as the demand for eastern marble developed at Rome during the course of the second century AD, and ships were forced to sail in different waters, the pattern of shipwrecks changes markedly.<sup>23</sup> The ships carrying marble from Prokonnesos and Thasos, in particular, were travelling further and

16 See Table 8.1: the Camarina A, Capo Cimiti, Capo Granitola A and D, Capo Rizzuto, Dramont I, Ekinlik Adasi, Giardini Naxos, Hierapetra, Isola delle Correnti, Kizilburun, Lerici, Mahdia, Marseillan Beauséjour, Marzamemi A-C, Meloria C, Methone C and D, Paros, Porto Nuovo, Punta de la Mora, Punta Scifo A, Saint-Tropez A, Saintes-Marie 18, 21 and 22, San Pietro, Sète, Şile, Torre Chianca, and Torre Sgarrata wrecks contain broadly identified materials; the Ashqelon, Caesarea 2, Les Riches Dunes 5, and Rhône Delta wrecks contain some identified materials; and the Anzio, Arwad C, Blackfriars 1, Carry-le-Rouet, Dor 2001/1, Izmetište, Jakljan Island, Nicotera, Salerno, and Veliki Školj wrecks appear to contain only local materials (sandstone, limestone or basalt from localised sources).

17 Antikythera A, Blackfriars 1, Caesarea 1, Camarina A, Capo Granitola A, Carry-le-Rouet, Dor 2001/1, Dramont I, Ekinlik Adasi, Giardini Naxos, Isola delle Correnti, Izmetište, La Maddalena, La Mirande (Port-Vendres 5), Les Riches Dunes 5, Mahdia, Marseillan Beauséjour, Marzamemi A, Meloria C, Methone C and D, Nicotea, Poro Nuovo, Punta

del Francese, Rhône Delta, Saintes-Maries 22, Santa Maria, Skerki Bank F, Torre Chianca, Torre Sgarrata, and Tremiti Islands.

18 Ashqelon, Caesarea 2, Capo Granitola D, Capo Rizzuto, Golfo di Baratti B, Hierapetra, Jakljan Island, Kizilburun, Ladispoli B, Marzamemi B, Paros, Port-de-Bouc, Punta de la Mora, Punta Scifo A, Saint-Tropez A, Salakta, San Pietro, and Şile.

19 'Roman Imperial' are Benalmadena, Cape Cromyon, Capo Taormina, Capraia C and D, Lerici, Margarina, Marzamemi C, Punta Sardegna, Saintes-Marie 18 and 21, Sète, Sidi Ahmad, and Veliki Školj; probably 'Roman' are Agropoli, Anzio, Arwad C, Cádiz E, Capo Cimiti, Lixouri, Punta del Milagro, Salerno, Sant'Antioco B, and Sapientza. On these date ranges, see Parker 1992a: 8–9.

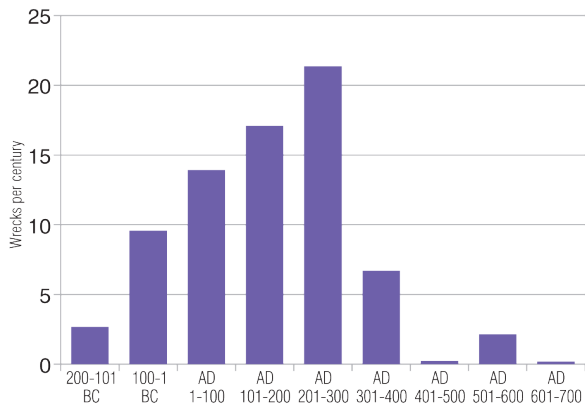
20 See Wilson, this volume (Chapter Two).

21 Parker 1992a: 8–9; Wilson, this volume (Chapter Two).

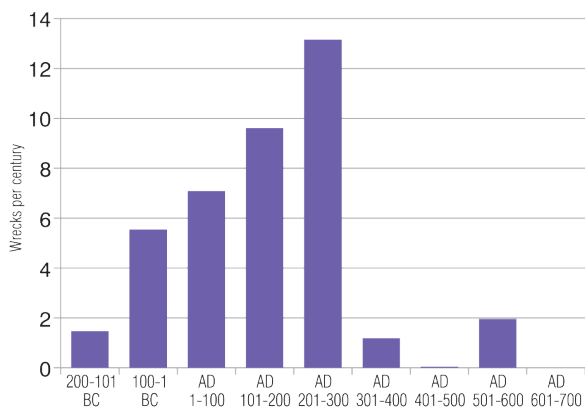
22 See Amadori *et al.* 1998; Fant 1999.

23 On changing patterns of demand for white marbles, see Walker 1988.





**Figure 8.3.** The 73 shipwrecks with cargoes containing stone objects by century, using probability per annum.



**Figure 8.4.** The 38 shipwrecks datable to within a 100-year period with cargoes containing stone objects per century.

through significantly more dangerous waters, particularly those off the southern Peloponnese, in the Gulf of Taranto, the Straits of Messina and even the Strait of Sicily. Since most ships sink when they collide with land (literally 'wrecked'), open-water sailing is always safer.<sup>24</sup> The route from the Aegean to Rome, therefore, demanded that navigators braved hazardous waters to a far greater degree than between, for example, Luna and Rome. Shipwrecks peak, in other words, at precisely the point when the long-distance transport of marble, particularly marble from the eastern Mediterranean, reaches its peak and not necessarily when the shipment of marble more generally reaches its peak. In other words, the distribution and chronology of shipwrecks in part reflects the level of risk to shipping rather than necessarily the scale of traffic in a particular area.

24 I am grateful to Nicholas Rodger for discussion on this point.

25 Meijer 2002: 149–53.

### Vessel type and size

Another explanation for the high number of third-century wrecks containing stone cargoes has been proposed by Meijer based on the character of the vessels engaged in this trade.<sup>25</sup> Arguing that the bulk of long-distance stone transport in the first and second centuries AD was coordinated by the imperial administration, he suggests that in this period investment in shipping reached its peak; the state, consequently, was able to pick and choose which ships and shippers it employed. In contrast, as imperial demand for marble declined during the course of the third century and economic crisis affected the capabilities of private financiers, investment in shipping declined. Meijer assumes, therefore, that in this later period ships were left to get old and a higher proportion sank. This view receives partial support from the Torre Sgarrata ship which was certainly old by the time it sank; dendro-chronological dating of the timber of the partially preserved hull shows that it was cut at least a century, possibly two centuries, before the vessel went down.<sup>26</sup>

The problem with this argument generally is that it rests on the assumption that most of the observable traffic resulted from imperial stimulus. Identifying imperially-owned produce in shipwrecks, however, is almost impossible. Quarry inscriptions, of the kind found on blocks at certain major quarries (Dokimeion, Chemtou and Luna most notably) and at Portus and Rome, are only found on the columns on the Punta Scifo A wreck and the blocks on the Marseillan Beauséjour wreck.<sup>27</sup> Several factors explain this scarcity, both already touched upon. Firstly, very little of this material has been raised to the surface to be examined carefully. Secondly, our view of traffic heading towards Rome is dominated by wrecks datable to the third century, when these inscriptions were being phased out. Though it seems likely, therefore, that a high proportion of the material being moved around overseas in this period belonged to the imperial administration, this cannot be proven. Several smaller shipwrecks show the other side of the picture. The Blackfriars 1 ship, for example, was carrying building stone from Kent to London; the undated Anzio, Arwad C, and Salerno ships carried similarly small cargoes of only local significance. Although less spectacular than the wrecks that have attracted most attention, these shipwrecks are no less important for an understanding of the economy in this period and are reflective of what must have been a significant non-imperial traffic in aggregate terms. An analysis of the size and composition of all of the known stone cargoes suggests that a variety of ships was probably engaged in this trade.

26 Throckmorton 1969: 300.

27 On the inscribed blocks from Portus, see Pensabene 1994.

Pliny the Elder refers to ships carrying marble, as do several other authors, but only Petronius seems to refer to stone-carrying ships, *naves lapidariae*.<sup>28</sup> Petronius' text is highly satirical, however, and is a dubious source from which to extrapolate a whole class of vessels, as Fant has argued.<sup>29</sup> We should be careful, therefore, not to presume that all ships carrying stone were specialised stone-carriers. Casson has suggested that stone-carriers would have been shorter and sturdier than those designed for carrying the same capacity of grain, but presumably specialised ships were only required when the quantities of stone being carried surpassed a certain amount.<sup>30</sup> Although extraordinary vessels were created for the shipping of obelisks, as far as we can tell, the majority of stone cargoes in our catalogue could have been carried by ordinary merchant ships.<sup>31</sup> Non-specialist ships could certainly have been adapted for this type of cargo: for the transport of columns from Lepcis Magna in 1817, for example, an ordinary Royal Navy store-ship was used, its hold reconfigured to suit the unusual cargo.<sup>32</sup> In antiquity, of course, it might have been necessary to ship monolithic columns in ships with open holds, but if columns could be angled during loading they could probably be stowed through relatively small hatches.<sup>33</sup>

The hulls of only very few of these ships have been excavated, so in most cases their size has to be estimated from the dimensions and weight of their cargo; since it is impossible to know how full a ship was at the time of sinking or what proportion of the original cargo is represented by the extant objects, ship sizes based on cargo sizes must be thought of as minima. The potential weight of perishables must always be considered. In addition, the dispersion of elements of cargo during sinking, salvage in antiquity and looting thereafter are likely to have changed the character of our sample considerably.<sup>34</sup> Nevertheless, an analysis of the weight of stone cargoes being moved around in this period reveals an interesting picture (see Table 8.1): nearly half of the stone cargoes whose weight can be calculated weigh less than 50 tonnes, many of them much less, and it is likely

that more can be added to this total.<sup>35</sup> Even if we double this figure to account for any perishable elements, we are dealing with ships classed by Parker as 'small'.<sup>36</sup> Almost all of the wrecks that typically figure in discussions of the marble trade are among the third carrying cargoes which weigh more than this.<sup>37</sup> If we are looking for specialised stone-carriers, then it is probably at these larger vessels, carrying cargoes of 90 tonnes or more, that we should be looking. The largest of these, the Isola delle Correnti and Capo Granitola A ships, have been estimated by Kapitän at 40–48 m in length.<sup>38</sup> Whether these vessels carried stone all the time is unclear, but in two instances it is possible to identify previous cargoes. At Capo Granitola A, tiny chips of *verde antico* and several varieties of white and grey marbles discovered alongside the main cargo of Prokonnesian blocks are almost certainly remnants of a previous voyage.<sup>39</sup> Similarly, at Punta del Francese black and white marble chips were found among the cargo of large blocks of white, perhaps Luna, marble.<sup>40</sup> Detailed investigation of other known wrecks would probably supply much more data of this kind.

The majority of these largest ships were wrecked off southern Italy and Sicily. In fact, when all of the wrecks with reconstructable cargo weights are plotted on a map clear regional discrepancies emerge (Figure 8.5). The vast majority of the wrecks with stone cargoes weighing over 50 tonnes are concentrated in the central Mediterranean. Most of these appear to have been travelling to Rome. Smaller stone cargoes, however, are more evenly distributed across the whole Mediterranean. A particular concentration of small- to medium-sized stone cargoes is visible off southern France, suggesting that the large Gallic market for imported stone was fed by smaller ships shuttling material along the Ligurian coast from Luna.<sup>41</sup> Large cargoes have been identified in this area, at Saint-Tropez A for example, but they are far less common here than they are off southern Italy.

As already discussed, most of the large wrecks off southern Italy and Sicily are datable to the second and third centuries AD. This might suggest that the ships being

28 See also Petronius *Satyricon* 117.12.

29 *Pers. comm.* Clayton Fant.

30 Casson 1971: 173.

31 On this point see Wirsching 2000, whose reconstructions need treating with caution.

32 Smythe 1854: 488–89.

33 *P.Bingen* 77: l.22, records that tree trunks were carried in an *akatos*, an open vessel mainly used for tramping (see Heilporn 2000: 343 and Casson 1971: 159–60) and it is possible that larger versions of this type existed for long-distance transport.

34 The legal sources offer some insights into both of these activities: *Digest* 47.9.1 and 3–7.

35 These include the cargoes from Ashqelon, Benalmadena, Cádiz E, Caesarea 1 and 2, Camarina A, Capo Granitola D, Capo Rizzuto, Capraia C, Carry-le-Rouet, Dor 2001/1,

Dramont I, Golfo di Baratti B, Hierapetra, Jakljan Island, La Maddalena, Lerici, Les Riches Dunes 5, Lixouri, Marseillan Beauséjour, Marzamemi C, Meloria C, Methone D, Port-de-Bouc, Punta de la Mora, Rhône Delta, Saintes-Maries 18, Santa Maria, Sète, Skerki Bank F, and Veliki Školj.

36 Parker 1992b: 89.

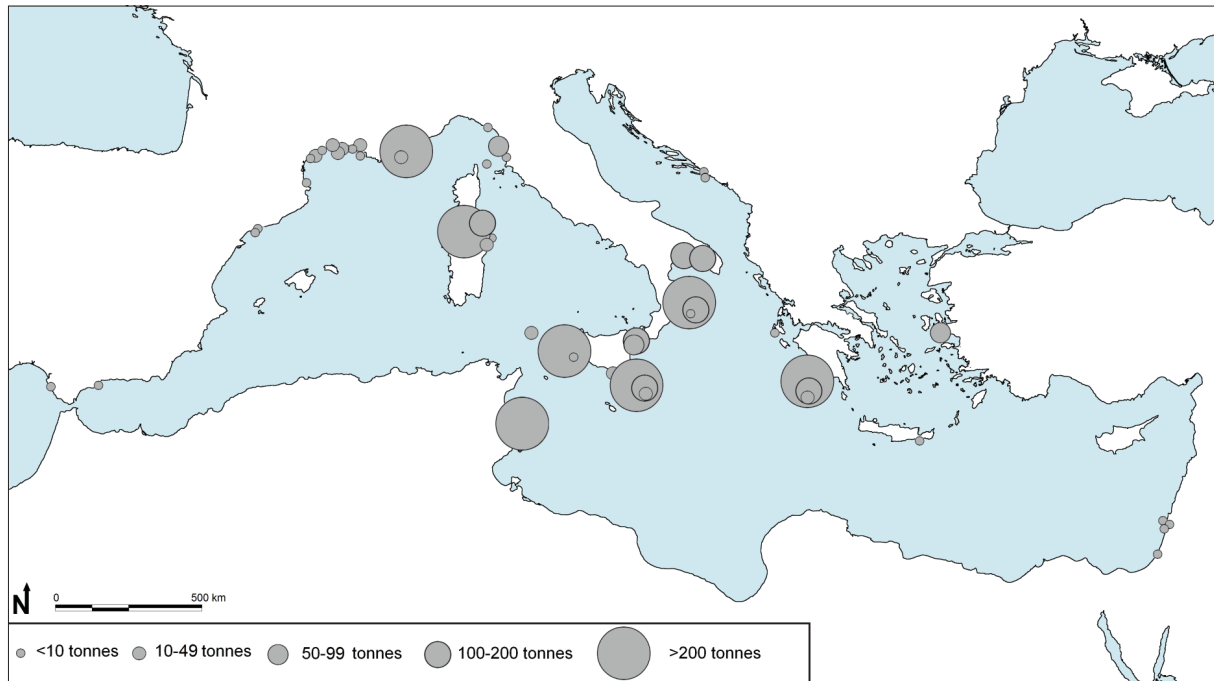
37 These large cargoes include those from Capo Cimiti, Capo Granitola A, Capo Taormina, Giardini Naxos, Isola delle Correnti, Kizilburun, Mahdia, Marzamemi A, Methone C, Porto Nuovo, Punta del Francese, Punta Scifo A, Saint-Tropez A, San Pietro, Sapienza, and Torre Sgarata.

38 Kapitän 1971: 304; Royal 2008: 150.

39 Purpura 1977: 1987; Gianfrotta and Pomey 1981: 219.

40 See <http://archeogate.it/subacquea/article.php?id=115&offset=3> (last consulted 25 November 2010).

41 On this point, see Bernard 2009: 520.



**Figure 8.5.** Distribution map of the 51 shipwrecks with cargoes containing stone objects with reconstructable weights.

used to transport marble were getting larger. However, although there is a particular density of large cargoes datable to the late second and early third centuries AD, large ships are apparent throughout our sample in every century. The point, of course, is that stone objects, like objects of any other type were transported to suit different needs, to meet different patterns of consumer demand. It should be of no surprise, therefore, to discover that not all stone objects were moved around in enormous specialist stone-carriers. In every period the picture is highly varied.

### Cargo composition

In order to understand the extent of this variety we need to look at the cargoes, or what is left of them, in more detail. Of the 73 known shipwrecks in which stone formed some element of the cargo, it initially appears to have been the sole material being carried in any significant quantity in the vast majority. Of course, there are numerous reasons for doubting the reliability of this observation. Most of our wrecks have only been summarily surveyed and, if ceramic finds are noted in the relevant publications, discussion of their type or quantity is rarely detailed. In addition, there is the ever-present

issue of perishables. In order to transport stone objects safely, especially columns, some form of packing material or dunnage would have been required. Straw or wood chippings could have worked (nowadays inflatable bags are standard), but it seems more likely that a saleable product was used. In his nineteenth-century description of the shipping of Carrara marble from Livorno, Lee notes that the cargoes of stone 'are usually made up with light goods, of which pumice stone, hemp, oil, and sumac form the principal part.'<sup>42</sup> For antiquity, sacks of beans or lentils are possibilities; according to Pliny, the ship used to transport the obelisk to Rome under Gaius had a ballast of 120,000 *modii* of lentils, but these would have been ruined if they got wet; timber would have been another option.<sup>43</sup>

With all of this in mind, it is still surprising that large quantities of other objects that usually attract the attention of underwater archaeologists, like amphorae or ingots, have not been identified at most of our wrecks. Ceramics are found, and are useful for dating these cargoes, but only in relatively limited quantities. Even at Torre Sgarrata, where as many as 30 Tripolitanian and other amphorae were recovered, the total ceramic assemblage is dwarfed by that of stone,<sup>44</sup> while at Marseillan Beauséjour, where specific attention was paid to the ceramic assemblage, only four Dressel 20, two

42 Lee 1888: 18; though he notes that the oil and sumac have to be kept away from the marble since they can damage its surface.

43 Pliny the Elder *Naturalis Historia* 26.201; it makes most sense that the materials or products used as dunnage were easily available, so while beans and lentils are plausible for

shipping from Egypt, timber might have been preferred in the northern Aegean.

44 See Throckmorton 1989: 263; Parker 1992a: 429, who suggests the amphorae are nothing more than 'shipboard items'.

Dressel 2–4, and several Gaulish amphorae fragments were identified.<sup>45</sup> In fact, only the Antikythera A, Margarina, Izmetište and Skerki Bank F wrecks seem to have contained large quantities of materials other than stone, while the La Mirande (Port-Vendres 5) wreck is the only one at which the known stone objects seem to have constituted a minority of the cargo. Here, five panels of Carrara veneer, all probably sawn from the same block, were found alongside a cargo of Pascual I amphorae.<sup>46</sup> To this example could be added the Miramar wreck off Morocco, on which a marble slab was found alongside a cargo of pre-Roman amphorae, but the report of these finds is too brief to inspire complete confidence.<sup>47</sup>

Where stone was being carried, therefore, it seems to have constituted the main component of the cargo, in terms of weight, volume, and probably also value. Stone cargoes were not, though, as homogeneous as they at first appear. Of the 68 wrecks in our sample at which more than a single stone item has been found, 28 had cargoes consisting of more than one type of stone object.<sup>48</sup> Blocks and columns, raw materials for architectural elements, are the most common elements shipped together, though veneer panels are often found alongside other stone objects, at Benalmadena, Les Riches Dunes 5, Porto Nuovo, Santa Maria, Saint-Tropez A and Torre Sgarrata, for example. Rarely, however, did any of these cargoes contain a huge array of different stone objects; the only exceptions to this rule are the mixed cargoes found at Mahdia, at Paros and at Şile, though one might also add Punta Scifo A to this list.

These cargoes can also be analysed according to the finish of the objects being transported. Objects finished to every stage of carving were transported. Hence, roughed-out sarcophagi have been found at Torre Sgarrata, San Pietro and Methone D, and finished or near-finished ones at Punta de la Mora, Capo Rizzuto, Hierapetra and Şile. Similarly, roughed-out statues were recovered at Şile, and finished ones at Mahdia, Antikythera A and Ashqelon. Objects of different type on the same ship might also be finished to different degrees: on the Punta Scifo A wreck, for example, each class of object, columns, blocks, basins, capitals and bases, is carved to a different degree. However, it is

important to note that it is rare to find objects of the same type finished to different degrees in the same cargo.

The types of stone being transported are similarly homogenous. Most of the cargoes consist of material from only a single quarry. In fact, only 11 of the wrecks contain stone from two or more sources.<sup>49</sup> The Torre Sgarrata and Porto Nuovo ships, in particular, were carrying stacks of veneer panels in various materials alongside sarcophagi and blocks in the former and blocks and alongside columns in the latter; 10 stone types are represented by the panels from Porto Nuovo alone.<sup>50</sup> The Les Riches Dunes 5 ship was carrying a variety of objects, all apparently in different white marbles: a small column in Carrara, a large block in Dokimeian white marble, a base in Pentelic, a series of supports in Carrara and Thasos and veneer panels in Prokonnesian.<sup>51</sup>

Of course, not all the objects being moved around the Mediterranean were new. Certain objects on the Mahdia and Antikythera A wrecks were old at the time of shipment; both contained a large number of precious works of art, many apparently antiques, and the Antikythera A cargo is almost certainly a shipment of booty following the defeat of Mithridates. At least some of the objects on the Les Riches Dunes 5 wreck were also second-hand; the column and base at least are both entirely finished and the former had been repaired at some point.<sup>52</sup> More interesting from this perspective is the Methone C wreck, datable to the early third century AD. In this case, the cargo consisted of at least 36 fragmentary granite columns, apparently already broken at the time of loading, since none of these pieces appears to fit together. As the ends of these columns are finished, not left with the usual protective collars, they probably come from a ruined building, perhaps testifying to the existence of a long-distance trade in architectural scrap in this period.<sup>53</sup>

### Patterns of connectivity: direct and indirect commerce

The observations above show that the majority, or at least a large proportion, of the ships in our sample appear to

45 See Bernard 2009.

46 Descamps 1992.

47 Boube 1979–1980.

48 These are the Ashqelon, Benalmadena, Caesarea 2, Camarina A, Capo Granitola D, Capo Taormina, Ekinlik Adası, Giardini Naxos, Isola delle Correnti, Kızılburun, Les Riches Dunes 5, Lixouri, Mahdia, Margarina, Marzamemi B, Meloria C, Paros, Port-de-Bouc, Porto Nuovo, Punta Scifo A, Rhône Delta, Saint-Tropez A, Salakta, Santa Maria, Sète, Şile, Skerki Bank F, and Torre Sgarrata wrecks.

49 This number is likely to be much higher, since the majority of publications identify the material as ‘marble’ only, without distinguishing different marble types; two stone

types are found among the cargoes at Ashqelon, Camarina A, Giardini Naxos, Izmetište, Marzamemi B, Rhône Delta, and Şile; and more than two at Les Riches Dunes 5, Porto Nuovo, Punta Scifo A, and Torre Sgarrata.

50 At Torre Sgarrata the veneer panels appear to have been transported inside the sarcophagi and Throckmorton (1969) noted ‘thousands of fragments of the half-inch-thick marble sheeting’; on the materials used for veneer on the Porto Nuovo ship, see Mazeran 1998: 137.

51 *Pers. comm.* H. Bernard.

52 See Bernard 2003.

53 See Throckmorton and Bullitt 1963: 19.



have been carrying just stone objects from a single source. While it was relatively common for ships to transport more than one type of object, in only a handful of cases did these objects come from a range of quarries. The level of finish on the objects being carried is consistent within each cargo, even if it varies between object class.

This suggests that the bulk of this traffic was engaged in what is typically described as 'direct' or 'commissioned' trade or redistribution. In other words, the various elements of the cargo were loaded at one port for transport to another, pre-determined port. This was not tramping, whereby goods were bought and sold at various points along the route.<sup>54</sup> As a heavy and valuable material, it makes sense that most stone was moved around in this way, only being transported to meet very specific demand from a client, whether the final consumer or an intermediary workshop. The wandering *caboteur* of Horden and Purcell's Mediterranean, stopping here and there, loading and unloading cargoes according to the changing market, is unlikely to have played much of a role in the movement of stone of this type.<sup>55</sup> In most cases, the products being moved probably already had a buyer; in some cases they might already have been paid for. When Cicero purchased statues through agents in Greece, he arranged shipping separately himself. Writing to Atticus, Cicero recommends that 'if a ship of Lentulus' is not available, put them aboard any you think fit'.<sup>56</sup>

The cargo of the San Pietro wreck, originally published by Ward-Perkins and Throckmorton and recently restudied by Alessio and Zaccaria, certainly appears to have constituted a specific order.<sup>57</sup> This ship was carrying 23 sarcophagi of Thasian marble; the rounded pieces with projecting protomes were designed for later carving into the so-called *Löwensarkophag*, for which Rome was the primary market.<sup>58</sup> Six of these were stacked in pairs, a smaller one within a larger one to economise on space during transit; a further six were produced in joined pairs, for separation after arrival, while at least two had lids attached to one of their long sides.<sup>59</sup> These pieces were obviously designed specifically for shipment. They were also apparently destined for a

single secondary workshop since, as Ward-Perkins and Throckmorton noted, the lid attached to the side of sarcophagus no. 6 was made to fit no. 22.<sup>60</sup> Roughed-out sarcophagi of this type are known at the Saliara quarries on Thasos, some in pairs, and several pieces which still preserve sections of this rough form can be found in Rome.<sup>61</sup> It is one of these sarcophagi that the sculptor Eutropos chose to show himself finishing on his grave plaque from Urbino.<sup>62</sup>

It was clearly relatively common to order material directly from the quarries. A find from Prokonnesos shows one way that the process could work. This single large Corinthian capital is carved in the particular style of a workshop based at Aquileia, in northern Italy.<sup>63</sup> It is even carved from the local Aurisina limestone, quarried near Trieste. The only explanation for its presence on Prokonnesos is that it was sent to the island to act as a model for the carving of other capitals in the more prestigious white marble.

Examples of the transport of specific commissions can be identified in every period in our sample. The late second- or early first-century BC Carry-le-Rouet ship, for example, was carrying 24 blocks of limestone from the quarries at Ponteau, apparently destined for the construction of the city walls of Marseilles.<sup>64</sup> The various parts of a large column (30 Roman feet tall) from the first-century BC Kızılburun wreck presumably also fall into this category. So too do the series of monumental column drums being carried by the second-century AD ship from Saint-Tropez, the dimensions of which fit the 'Capitolium' at Narbonne, and the single enormous column drum recovered off Lerici, near La Spezia, which was presumably part of a larger commission.<sup>65</sup> The sixth-century basilica components from Marzamemi B can be added to this list.<sup>66</sup> That single ships might carry multiple specific commissions is suggested by the cargo of the Şile wreck. In this case, the two columns were too small for the single base also being transported and too large for the five Ionic capitals, four of which were of equal dimensions, one slightly larger; the enormous roughed-out statue of a cuirassed emperor from this wreck, now in the front yard of the Istanbul Archaeological Museum, must have been commissioned.<sup>67</sup>

54 Here, of course, the term 'direct' describes the conceptual character of the activity rather than the route of the voyage: as Arnaud (2007: 326) has pointed out, it is anachronistic to assume, in most cases, that Roman shippers took, or even knew, the shortest, most direct routes between ports. On patterns of maritime connectivity generally, see Nieto 1997.

55 See Horden and Purcell 2000: 365–77.

56 Cicero *Letters to Atticus* 1.8–9.

57 Alessio and Zaccaria 1997.

58 Chiarlo 1974: 1307–45; for the protome variety, see Stroszek 1998: nos. 1–172, and for the lions with raised heads that could also be carved from this form, see nos. 209, 242, 305, 340, and 365.

59 See Ward-Perkins and Throckmorton 1965: 205–7 (no. 5

inside 4; 17 inside 16; 20 inside 19; 8 and 9, 10 and 11, and 12 and 13 joined as pairs; and 6, 14, and 22 with attached lids).

60 Ward-Perkins and Throckmorton 1965: 205.

61 Koželj *et al.* 1985; Wurch-Koželj and Koželj 1995.

62 See Koch 1993: 37.

63 Pensabene 2002: 55, fig. 25.

64 Kainic 1986; on the shipment of stone from these coastal quarries to Marseilles generally, see Tréziny 2009.

65 On the proposed link between the Saint-Tropez wreck and the 'Capitolium' at Narbonne, see Perret 1956.

66 Kapitän 1969 and 1976.

67 See Beykan 1988; another two partially-worked imperial statues, of slightly smaller dimensions, were found on the island (see Asgari 1990: fig. 29).

If, as the evidence suggests, the bulk of the traffic identifiable from the shipwreck evidence originated at harbours closely or directly associated with the quarries, this adds an interesting extra dimension to our understanding of port hierarchies in this period. Such ports probably operated semi-independently of the larger urban ports of the Mediterranean and we should not underestimate the importance of harbours like that at Saraylar, on Prokonnesos, for example. The mooring installations at Alikí, on Thasos, have already been published in detail and suggest intense activity.<sup>68</sup> Even smaller quarries had their own quays independent of the local urban centres: the Southern Euboea Exploration Project has identified at least one such loading station, separate from the harbour at Karystos.<sup>69</sup> The harbour at Splitska on the island of Brač is another example. Here, recent finds of Prokonnesian marble and Egyptian granite show that the harbour acted as a nodal point for the distribution of imported as well as local marble in Dalmatia.<sup>70</sup>

While the bulk of stone probably moved around the Mediterranean in this way, along direct lines between the quarries and their associated harbours and the consumer, different processes are also visible. It seems unlikely, for example, that the veneer panels in the La Mirande wreck were part of a specific commission. Here tramping, or possibly secondary redistribution of material from a central emporium, seems a more plausible reality. Whether statues and sarcophagi were also distributed via this kind of indirect commerce is more questionable. A significant number of single statues have been recovered from the seabed but it seems unlikely that large, heavy statues would be moved around without a buyer already secured. For smaller pieces, of course, this is more of a possibility and there is actually some support in the literary sources for a trade in finished statues. In his description of the life of Apollonius of Tyana, Philostratus describes a conversation between the sophist and a merchant in the Piraeus carrying a cargo of statues of deities to Asia Minor.<sup>71</sup> His aim, as he puts it, is to sell them 'to those who desire to dedicate them', implying that he was not delivering specific commissions. Indeed, Apollonius goes on to rebuke the merchant for taking these statues 'into harbours and market places just as if they were wares of the Hyrcanians or Scythians'.

Against this background, the large quantity of veneer panels in various stones in the Torre Sgarrata and Porto

Nuovo ships is especially intriguing. Though the sarcophagi and blocks in the former and columns/column drums and blocks in the latter were presumably destined for a pre-determined market or a specific commissioner, these veneer panels could well have been sold at intermediate markets along the way. Stone destined for veneer panels usually travelled in block form, stepped to facilitate sawing and to check the consistency of patterning on coloured stones: *pavonazetto* examples were found at Punta Scifo A, *cipollino* ones at Giardini Naxos. However, these blocks, though easier to transport, required access to the equipment and skilled workers capable of sawing them. Pre-cut panels, therefore, probably represented a more saleable version, the relative lightness of which made it a suitable complementary cargo.<sup>72</sup> As Pliny the Elder put it, 'whoever first discovered how to cut marble and carve up luxury into many portions was a man of misplaced ingenuity'.<sup>73</sup> In other words, the shippers and traders in charge of the Torre Sgarrata and Porto Nuovo ships could well have been engaging in both direct trade and tramping simultaneously; the dichotomy between these two activities is not clear-cut.

If a greater variety of commercial activity was taking place than had previously been suspected, then it is entirely possible that some of the different elements of the cargoes in our sample were loaded separately and not at the quarries from which they originated. In the case of the Dramont I wreck, Joncheray has argued that the ship's contents—*africano* blocks, emery from Naxos, fragments of Dressel 2–4, Dressel 7–11 and Dressel 20 amphorae, copper objects of probable Egyptian origin and pumice from the south of Italy—allow the final voyage of the vessel from Teos, via Naxos, southern Italy and Portus, prior to reaching the south of France, to be reconstructed.<sup>74</sup> Portus is regarded as the stopover port at which the amphorae and copper objects were loaded. However, and with this in mind, there is no reason to assume that the whole cargo was not all loaded together at Portus. Though there is no compelling evidence, in this case, to prove either situation, the arrangement of the cargo of the Punta Scifo A wreck strongly suggests that the material being carried, from two distinct origins, Prokonnesos and Dokimeion, was loaded at a single point in time and space.<sup>75</sup> Nicomedia or Ephesos are the likely options. While major urban ports were likely to have played an important part in the distribution of stone and

68 Sodini *et al.* 1980: 119–22.

69 I am grateful to Jere Wickens for supplying unpublished documentation of this site at Vigles on the Bouro beach road to the east of Karystos.

70 These pieces are now in the courtyard of the museum at Škrip and are presumably to be connected with the building of Diocletian's Palace at Split; a large number of Egyptian granite columns, most apparently second-hand (*pers. comm.* J. Belamarć), were used at the palace in combination with capitals and bases in Brač limestone and it is

possible that imports passed through Brač as a matter of course.

71 Philostratus *Life of Apollonius of Tyana* 5.20.

72 On this point, see Russell 2008: 116–19.

73 Pliny the Elder *Naturalis Historia* 36.51.

74 See Joncheray 1998: 151–52; Dallaire 1993. For a similar approach see Williams-Thorpe and Thorpe 1990 on a fourth-century BC wreck of millstones.

75 Pensabene 1978: 112–14.

stone objects, they need to be considered alongside the quarry harbours discussed above; though usually smaller, the latter were entirely geared towards the shipping of stone. Loading and unloading large cargoes of stone has always been a specialist activity. According to Lee, the stowage of marble at Livorno in the nineteenth century was 'raised to the dignity of a fine art', which generations of stevedores have inherited and improved upon.<sup>76</sup>

## Conclusions

As Jongman has noted, in most pre-industrial societies, building is the single most important non-agrarian economic activity.<sup>77</sup> Stone was not the only material used in building but, in the Roman Imperial period in particular, it was the most important one. Stones of real prestige were often transported enormous distances. Furthermore, when one considers the aggregate demand for such materials from other sectors for the production of statues and funerary monuments, for example, it is clear that the quarrying, production and distribution of stone as a raw material and as finished products, need to be considered major elements of the Roman economy. Furthermore, as the most permanent material vestiges of antiquity, stone artefacts are particularly useful in illuminating broader developments, both economic and socio-cultural. What the evidence from shipwrecks

shows most clearly is the sheer variety of activity in this period. Stone objects were moved around in various quantities and states of finish, often but not always in fairly homogeneous cargoes and in ships of almost every size. Every type of stone object was exposed to a different pattern of demand and this demand varied across time and space. The same is true for every class of artefact, ceramics, metals, textiles, etc., and so we should not be surprised to see the number of shipwrecks carrying different cargoes to peak in different periods. Across a space as varied, in geographic, ecological, socio-cultural terms, as the Roman empire, any model of the economy needs to be flexible enough on a macro-level to be able satisfactorily to incorporate the range of behavioural differences observable on a micro-level.

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76 Lee 1888: 18.

77 Jongman 2007: 609.

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