

esset ad θοῦρον, quo languida feret sententia.³ Hermann, after considering the possibility of a lacuna of one verse between πᾶσιν ὅς and ἀντέττη, settled for πᾶσι δ' ἀντέττη θεοῖς. However, as Mark Griffith pointed out,⁴ the relative ὅς would hardly have replaced the simple δέ. Griffith preferred the asyndeton πᾶσιν ἀντέττη θεοῖς, resulting from Wellauer's deletion of ὅς. The asyndeton was defended by Wilamowitz,⁵ but it is harsh and it is not necessary, as we shall see. Murray kept ὅς and πᾶσιν:⁶ θοῦρον Τυφῶν' ὅς πᾶσιν. But the prosody Τυφῶν' is doubtful. Headlam's θεός ὅς, described as 'a certain emendation' by George Thomson,⁷ is neat—haplography of ΘCOC to OC; but it does not adequately explain the presence of πᾶσιν.

πᾶσιν is more suspect than ὅς, because if ὅς can be kept, asyndeton is eliminated. Another reason for doubting πᾶσιν is that Typhos did not fight all the gods; he fought Zeus and his allies. Metre is restored, and point is given, to line 354 by the palaeographically simple change of one letter—by the emendation of πᾶσιν to κάσιν.

In the emended line an unelided disyllabic word is confined to the sixth element. For such a word in the sixth element Aesch. *Supp.* 516 may be compared: ἀλλ' οὔτι δαρὸν χρόνον ἐρημώσει πατήρ. After κάσιν comes a pause; a stronger pause after a disyllabic word in the sixth element is to be seen, and heard, in Soph. *Ajax* 342–3:

ποῦ Τεῦκρος; ἢ τὸν εἰσαεῖ
λεηλατήσῃ χρόνον; ἐγὼ δ' ἀπόλλυμαι;

Thus the rare metrical structure of the emended line is acceptable in a pre-Euripidean tragedy, whether or not *Prometheus Desmotes* is by Aeschylus. The conjecture κάσιν has been made long ago—by Wieseler, as a reader informs me. It deserves to be revived because it makes explicit the reason for the sympathy of Prometheus with the ferocious Typhos.

Prometheus pities Atlas, who is his brother (347–348); but he pities Typhos also, and Typhos is another brother, since Typhos is earthborn (351), and Themis, who is Earth (209–210), is the mother of Prometheus. The chorus also emphasizes the ties of kinship: ἐτένουσι τὰν εὐναιμόνων τε τιμάν (409–411). There are many words about kinship in the play because the strife between Zeus and Prometheus is all the more terrible for being an enmity of kin.⁸ Typhos suffered too in the family war between Zeus and his enemies; accordingly, in line 354 Prometheus sorrows for his furious brother who withstood gods: Τυφῶνα, θοῦρον κάσιν, ὅς ἀντέττη θεοῖς.

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³ *Aeschyli Tragoediae* ii (Leipzig 1852) 79.

⁴ *Aeschylus. Prometheus Bound* (Cambridge 1983) 150.

⁵ *Aeschyli Tragoediae* (1914, repr. Berlin 1958) 37.

⁶ O.C.T.² (Oxford 1955) 116, app. crit.

⁷ *Aeschylus. The Prometheus Bound* (Cambridge 1932) 153.

⁸ Concerning Zeus's divine victims as close relatives of Prometheus see now Griffith (n. 4) 14–15.

The Diolkos

R. M. Cook has recently pointed out that the transport of warships across the Isthmus of Corinth was

not the normal use of the *diolkos* since there was no regular need for such transport. Rather, the *diolkos* from its inception served a commercial function and its use provided the Corinthian state with a source of revenue.¹

Because information about its commercial use is lacking, Cook remains uncertain as to the success of the *diolkos* and its technical efficiency. He points out two possible drawbacks. Our knowledge of ancient merchant ships indicates that a ship could not be taken out of the water with cargo on board; thus, ship and cargo would have to be transported separately and then reloaded. Also, the movement of warships across the isthmus suggests that there may have been a relatively low limit to the weight of loads that could be transported on the *diolkos*. Drawing upon Thucydides and Polybius, Cook notes that in 412 triremes were transported across the isthmus whereas in 217 cataphracts, presumably *pentereis*, were not (unlike the *hemioliai* and undecked ships that were part of the same fleet). Because *pentereis* had dimensions similar to those of triremes but were somewhat heavier, weight may have been the criterion.²

Both suggestions are drawn, by necessity, from what is known about the occasional military use of the *diolkos* whereby warships were hauled across the track and assume the similar transport of merchant ships. In this regard, Cook acknowledges that neither point may be applicable if the *diolkos* was built to carry only cargo. He notes, 'It is, I suppose, possible that the original purpose and use of the *diolkos* was to transport cargoes and not ships and that that was why the Spartans had to construct ὄλκοι in 428 BC.'³ Further analysis suggests that its regular commercial use involved the transport not of merchant ships but of cargo, and from this perspective we can better assess the success of the *diolkos*.⁴

The differences between merchant ships and warships make it unlikely that the *diolkos* was intended to

¹ R. M. Cook, *JHS* xcix (1979) 152–3. Others who have recently emphasized the commercial aspects of the *diolkos* include J. Wiseman, *The Land of the ancient Corinthians* (Göteborg 1978) 45–6; and J. B. Salmon, *Wealthy Corinth: A history of the city to 338 BC* (Oxford 1984) 136–9. This was also the view of the excavator of the *diolkos* who suggested that commercial ships went over the *diolkos* empty while cargo was transported by wagon between Lechaion and Kenchreai; see N. Verdels, *ILN* ccxxxi (19 Oct. 1957) 650.

² Cook (n. 1) 152–3 n. 16, citing Thuc. viii 7–8 and Polyb. v 101.4. However, other explanations are also possible. Although the hulls of the *penteres* and the trireme were similar, the *penteres* was also supplied with an oar-box that, in addition to adding weight, may have made the warship more top heavy and consequently more awkward to move and handle on land; cf. J. Morrison and R. Williams, *Greek oared ships* (Cambridge 1968) 286, and L. Casson, *Ships and seamanship in the ancient world* (Princeton 1971) 102–3. Also the *penteres* may have carried more marines with their own gear or may have supported more rigging or armaments, practices that became common by the Hellenistic period. Of course, it is possible that Philip sent some of his ships around the Peloponnese simply for tactical reasons—to challenge Skerdilaidas, whose ships were committing acts of piracy off the cape of Malea (Polyb. v 95. 1, 101.1).

³ Cook (n. 1) 153 n. 29, referring to Thuc. iii 15.1.

⁴ Cook has now reached a similar conclusion and sees in the reference in Thucydides cited above an indication that before 428 only cargo was transported across the *diolkos*; see R. M. Cook, 'A further note on the *Diolkos*', in *Studies in honour of T. B. L. Webster*, i (Bristol 1986). I am grateful to Professor Cook for sending me a copy of his paper prior to publication.

transport merchant ships as it occasionally transported warships. Warships were usually lighter in weight, were long and narrow, carried little cargo, and were manned by large crews. Warships were regularly drawn up on shore or into slips by their crews, and they could also be transported over land. Herodotus, for example, recounts how Xerxes cut a canal a distance of twelve stades through the peninsula of Athos although there would have been no difficulty in hauling his ships over land. During the Peloponnesian War, we know that the Peloponnesians hauled their ships across the narrow isthmus of Leukas twice, in 427 and 425. In Sicily, Dionysius I is said to have had his men haul a fleet of eighty triremes over twenty stades. Alexander the Great even had ships transported from Phoenicia to Babylon, having them first cut into sections and then reassembled.⁵ It is not inconceivable that warships could have been transported the forty stades across the Isthmus of Corinth even without benefit of the *diolkos*.⁶

Warships capable of being hauled overland could also serve as merchant ships. Herodotus relates that the Phokaians traveled not in round ships but in pentekonters on their long voyages to the far western Mediterranean, which is not unexpected considering the exploratory (and perhaps piratical) nature of their expeditions. Although Herodotus makes no mention of trade, reference to commercial activities is often assumed. Similarly, Polykrates of Samos is said to have introduced a big-bellied pentekonter that could serve as both a cargo carrier and a warship—an exceptional vessel that was worthy of a special name, the *Samaina*. Both references describe events that appear to be atypical of their time; nevertheless, they show that the practice of using warships to transport cargo was known during the archaic period.⁷ The practice is known in later periods as well.⁸

In general, however, the warship's style of construction and need for a large crew necessarily limited the amount of cargo that could be carried on board, and for this reason the round ship would be preferred for trade and transport. Although it was less frequently described or depicted than the warship, the round ship, driven by sail or oar, had served throughout the Mediterranean as

the primary cargo ship dating back to the Bronze Age.⁹ During the archaic period when Corinth decided to build the *diolkos*, there is no need to doubt the availability of round ships or the presence of merchants who owned and used them.¹⁰ Because both types of ships were common, the use of warships to transport cargo was probably relatively rare. Although such ships could have been portaged, a plan by Corinth to increase her tax revenues through the construction and maintenance of the *diolkos* would not have been directed at this small element of commercial traffic.

Standard merchant ships, on the other hand, were generally too broad and too deep for transport over land, whether they were the sail-driven type or the merchant galley, and a track like the *diolkos* would be of limited use.¹¹ Even a large crew would have difficulty handling on land the merchant ship's more awkward shape, and as Cook points out such transport would be almost impossible when cargo was on board. It would be hard to imagine a shipowner regularly risking his ship, his most important investment, in such a way even when transporting his own goods, even less so if he was simply providing transport on his ship for the cargo of others. Whereas the warship usually had a life of 20 years or less (the longest-lived Attic trireme known was in use 26 years),¹² the merchant ship could have a much longer life, no doubt because it was not subjected to the same type of handling. The excavators of the Kyrenia shipwreck estimate that this fourth-century merchant ship may have had a life of more than 80 years.¹³

The *diolkos* must have been built and primarily used for the transport of cargo across the isthmus. Of course, the presence of the *diolkos* was not required for such activity. As Thucydides notes, Corinth had taken advantage of her position on the isthmus from early times, providing a passageway that served to link the Saronic and Corinthian Gulfs.¹⁴ A certain number of those who traveled by sea must regularly have found this route preferable to a trip around the Peloponnese. The latter method would generally involve only a single

⁵ Hdt. vii 24; Thuc. iii 81.1 and iv 8.2; Polyaeus v 2.6; Arr. *Anab.* vii 19.3. For further commentary, see Casson (n. 2) 89, 136. In light of the possible need to have the *pentereis* in Philip's fleet avoid transport across the Isthmus of Corinth, it is interesting to note that *pentereis* were among the ships that Alexander had cut in sections and transported over land to Babylon.

⁶ Interestingly, none of our historical sources that refer to the transport of warships across the isthmus refer specifically to the *diolkos*, as Cook (n. 1) 152 n. 7, points out; rather, its use is assumed.

⁷ Hdt. i 163.2, and Pl. *Per.* xxvi 3–4. Curiously, A. M. Snodgrass interprets the two events, presented as exceptions, as representing the norm in his argument against the use of the purpose-built, sail-driven merchantman during this period ('Heavy freight in archaic Greece', in P. D. Garnsey, K. Hopkins, and C. R. Whittaker, eds., *Trade in the ancient economy* [Berkeley 1983] 16–7). For a critique, see C. Reed, *Ancient World* x (1984) 39–41.

⁸ For example, in the third century BC we know that *lemboi* in the fleets of Demetrios of Pharos and Philip were transported across the Isthmus of Corinth, when we also have reference to a *lembos* sailing from Samos and Miletus to Alexandria carrying 258 18-chous jars and 102 half-jars of oil. However, we should note that there are various types of *lemboi*, some having 50 rowers, others as few as 16; see Casson (n. 2) 125–6, 162, for references and discussion.

⁹ For references, see Casson (n. 2) 32, 34, 35–6, 65–8 and Reed (n. 7) 41 n. 81. To the limited number of round-hulled sailing ships represented, we can now add one depicted on a Near Eastern seal of the eighth or seventh century (perhaps an example of a Phoenician *gaulos*); see N. Avigad, *BASOR* cxclvi (1982) 59–62.

¹⁰ S. Humphreys, *Anthropology and the Greeks* (London 1978) 166–8, has also argued against the use of round ships as trading vessels during the archaic period, because she sees the aristocratic owners of long ships as the source of the archaic Greek trader. However, by her emphasis on Greek trade and Greek ships Humphreys has tended to isolate events in the Aegean from their wider Mediterranean context and neglect the typically international character of most overseas trade. In concentrating on homogeneous bands of Greek *hetairoi*, she has not considered the impact on trade and transport in the Aegean of those Greeks who chose to live for a time in the Near East and work with or for eastern merchants. *Naukleroi* could have emerged from such a milieu at any time during the archaic period (or earlier).

¹¹ In estimating its capabilities, it is important to keep the size of the *diolkos* in mind; as Wiseman (n. 1) 45 notes, 'the channels are 1.5 m distant from each other, clear testimony, if it were needed, that only smaller craft (boats, not ships) were transported on the *diolkos*.'

¹² Casson (n. 2) 90–1.

¹³ M. L. Katzev, *National Geographic* cxxxvii (1970) 856.

¹⁴ Thuc. i 13.5. Salmon (n. 1) 138 has drawn attention to the fact that the earliest signs of settlement at the western end of the *diolkos* date to the late eighth century, although he exaggerates the difficulties of transporting cargo across the isthmus.

ship, whereas the former required two; but this would have presented little problem at active ports like Kenchreai and Lechaion. If someone, for example, wished to ship cargo from east to west, he could rent space on a ship heading to Kenchreai where he would have his cargo off-loaded and transported over land by wagon or pack animal to either Corinth or Lechaion;¹⁵ there, he could make arrangements with another shipowner and continue his journey westward. If he was a merchant, he also had the option of selling his cargo at either Kenchreai or Corinth and returning eastward, with or without a return cargo. Because this type of activity could often be carried on with just wagons and pack animals, we must assume that construction of the *diolkos* represented a technical advance that was intended to serve some portion of this transit trade.

While it is possible that the *diolkos* was capable of supporting only loads of relatively low weight when warships were being transported, the opposite conclusion seems more likely if the *diolkos* was built to transport cargo. With its relatively small track the *diolkos* would be best suited to carry cargo of substantial weight, particularly materials that could not easily be transported by wagon or pack animal. Various cargoes could be included within such a category. However, two materials that possessed the appropriate weight and bulk also had a geographic distribution that made transport across the *diolkos* especially appropriate—marble and timber.

The most desirable marbles were quarried first in the Cycladic islands and later in Attica. If we assume that the *diolkos* was built sometime in the sixth century, its construction would have coincided with the initial use of marble for life-size statues (c. 600) and for monumental buildings (c. 550). Much of these sculpting and building activities dating to the sixth century and later occurred in the west and thus required the transport of marble.

The sanctuary of Delphi at once comes to mind. Early marble structures there included the Temple of Apollo; the Athenian, Knidian, Massaliote, and Siphnian treasuries; the Athenian stoa; and the Naxian sphinx and column. The Temple of Zeus at Olympia also used imported marble from the Aegean (as well as dark stone imported from Eleusis).¹⁶ Marble statues dating from roughly the same time period have been found at a wide range of sites in the west. Richter's catalogues of *kouroi* and *korai* include examples from Delphi, Corinth, Tenea, Aktion, Naupaktos, Phigeleia, Taranto, Metaponto, Megara Hyblaia, Agrigento, Leontini, Grammichele, Marzabotto, Bologna, and even Marseilles.¹⁷ All are apparently made of Aegean marble. This list represents just a sample but is sufficient

to indicate the substantial quantity of marble that was transported from the Aegean to the west.

The methods by which the marble made its way from the quarry to the site normally involved the artist himself.¹⁸ A sculptor, for example, would usually make arrangements with a quarry owner, with a contractor to extract the marble, and then with various persons who could transport the marble by both land and sea to the site. This sequence of activities emphasizes the need of the sculptor to deal with a variety of persons to accomplish his task. When such an artist was traveling from the islands to points west, the need to deal with an additional shipper in order to transport the marble across the isthmus would hardly have prevented him from taking advantage of the *diolkos*, especially when it provided him with a faster, safer, and more direct route.¹⁹

The *diolkos* was also available for the shipment of timber but, unlike marble, most of this traffic would have gone from west to east. Timber sufficient for local needs was available in most regions of Greece; however, because of geological and climatic conditions, a few areas were without extensive forest cover and some timber had to be imported. This latter group included lands around the Saronic Gulf—Attica, Aigina, the eastern Argolid—and some of the Cyclades. The forest lands of western Greece, especially those with easy access to the Corinthian Gulf, would have provided the nearest timber source. Substantial public buildings probably would have required imported timber, and such structures dating to the archaic period have a wide distribution. In addition to places like Athens, Eleusis, Aigina, and Delos, archaic buildings have been identified at Sounion, Zoster, Megara, Troizen, Poros, and Hermione, as well as on the islands of Kea and Despotika; from Herodotus we learn of similar buildings on Siphnos.²⁰

¹⁸ For recent discussions concerning the involvement of the artist in the transport of marble, see Ashmole (n. 16) 15–22 and Snodgrass (n. 7) 19–20.

¹⁹ In discussing how the sculptor transported marble from Paros to Olympia, Ashmole (n. 16) 20–22, suggests a trip around the Peloponnese as the probable route, although he emphasizes the risks of having such deadweight on a ship in high sea as well as the evil reputation of Cape Malea, 'where the waves and the winds of two seas meet.' He mentions an alternative route, going across the isthmus and then along the 'much more sheltered course' of the Gulf of Corinth; but he is not enthusiastic about it, and understandably so. Ashmole believes that the sculptor would have relied on a single ship for the entire trip: the ship would have been transported across the *diolkos* while the marble was unloaded at Kenchreai, taken across by another route (a difficult task since it would require 'special vehicles and many teams of oxen to haul them along the normal roads across the isthmus'), and reloaded at Lechaion. Of course, the task would be much easier, and the route across the isthmus preferred, if the sculptor simply had the marble transported across the *diolkos* and then rented space aboard another ship on the Gulf of Corinth to continue his journey.

²⁰ W. Dörpfeld, *AthMitt* ix (1884) 324–37; K. Kourouniotis, *ArchDelt* xi (1927) 9–15; Ph. D. Stavropoulos, *ArchEph* (1938) 1–31; G. Gruben, *ArchDelt* xix (1964) 37–41; G. Welter, *Troizen und Kaulaureia* (Berlin 1941) 19–21, 43–5; M. H. McAllister, *Hesperia* xxxviii (1969) 169–83; G. Welter, *ArchAnz* (1954) 64–70; and G. Daux, *BCH* lxxxiv (1960) 814. For Siphnos, see Hdt. iii 57–8. More so than the sites around the Saronic Gulf, these and other Cycladic islands would have had easier access to other timber sources but it is still likely that they looked westward for some of their timber supplies.

¹⁵ The major road linking Kenchreai and Corinth would have supported this traffic; see Wiseman (n. 1) 64. That goods were also portaged on other roads crossing the isthmus is suggested by Strabo's reference (ix 1.10) to Tripodiskos as the agora of Megara; the village was situated on the roadway linking Megara and Pegai. For evidence of similar commercial traffic across the toe and heel of Italy in the archaic period, see A. J. Graham, *Ancient World* x (1984) 9–10.

¹⁶ B. Ashmole, *Architect and sculptor in classical Greece* (New York 1972) 15–22.

¹⁷ G. M. A. Richter, *Kouroi* (London 1970) nos. 12, 40, 41, 46, 73, 74, 103–105, 134, 149, 163a, 182–187, 189, 189b; and *Korai* (London 1968) nos. 89, 171, 172.

In addition to building timbers, most of the long, straight timbers needed for shipbuilding and for oars may also have been imported to this area. In the sixth century, only Aigina and Athens had substantial fleets but we can assume that neighboring states maintained a few triremes or pentekonters. During the Persian invasion, we know of ship contributions from Megara, Troizen, Epidauros, Hermione, and Kea, as well as from Aigina and Athens.²¹ As well as warships, a number of the merchant ships and fishing vessels constructed in this region were probably built of imported timber.

Although there is no evidence that timber was routinely transported across the isthmus during the sixth and fifth centuries, later epigraphical sources suggest a regular Corinthian involvement in the timber trade. In the early fourth century, Lykios of Corinth received the contract to supply fir for the Temple of Asklepios at Epidauros; the source of the fir was probably Sikyon or Ambrakia. Around the same time there is reference to a smaller shipment of wood, to be used in the chryselephantine statue, that is to be transported to Epidauros by way of Kenchreai. In the late fourth century, another shipment of timber came to Epidauros by way of Corinth. A final inscription that concerns the construction of apartment blocks in the early third century records a large-scale transaction in a timber market, again probably Corinth.²² Similarly, in the accounts of the Eleusinian commissioners in 329/8, a Corinthian named Hagnon is recorded as supplying a large quantity of elm and ash to the sanctuary.²³

Not unexpectedly, Corinthian involvement in the timber trade was not restricted to shipments across the isthmus. In the accounts recording the rebuilding of the Temple of Apollo at Delphi in the fourth century,²⁴ Sikyonians who drew upon the local resources of northern Arkadia supplied most of the timber, but they were joined by a Corinthian who provided cypress

wood. The presence of a Corinthian in this group is not surprising since Sikyon 'was probably the main source of Corinth's timber supplies.'²⁵ More surprising in the Delphic accounts, however, is the appearance of an Argive who supplies timber from Macedon, which shows that timber was occasionally shipped from east to west across the *diolkos*.

The various building inscriptions also suggest additional types of cargo that may have been shipped across the *diolkos*. Building stone other than marble, for example, was also imported. We know of shipments to Epidauros and Delphi from Corinth, to Athens from Aigina, to Epidauros from Argos, to Troizen from Megara, and to Hermione from an unknown source.²⁶ Although none of these particular examples would require shipment across the *diolkos*, an active trade is indicated.²⁷ Roof tiles were another cargo whose weight and bulk would make transport across the *diolkos* appropriate. We know of some roof tiles that were exported from Corinth—for example, to Athens—but whether they were carried on the *diolkos* would have depended on where in Corinthian territory they were produced.²⁸ Roof tiles were also imported to Delphi, Epidauros, and Delos, although sources are not specified.²⁹

Metals are another item referred to in building inscriptions, especially iron and bronze, although sources again are not specified.³⁰ It has recently been argued that metal ores along with marble made a sizeable contribution to the tonnage of sea transport during the archaic period, the two commodities perhaps constituting the bulk of overseas shipments.³¹ If such an assessment is accurate, it may explain in part Corinth's decision to construct the *diolkos* at that time.

How were these materials transported from one side of the isthmus to the other? Again the building inscriptions suggest possible methods. When ships were docked at either end of the *diolkos*, cargoes may have been 'rolled on' (ἐσκάλισις) or 'rolled off' (παρκάλισις) the vessels, as occurred with a shipment of marble going from the Peiraieus to Epidauros.³² To load or unload materials of substantial weight or bulk, some type of crane may have been used. We know that such a device

²¹ R. Meiggs, *Trees and timber in the ancient Mediterranean world* (Oxford 1982) 122–5, suggests that the primary source of timber for Athens' major shipbuilding program in the late 480s was Italy, but the Athenians must also have drawn upon the abundant timber sources in western Greece, both north and south of the Corinthian Gulf. The most convenient route for this western timber, whether from Greece or from Italy, would have involved the *diolkos*.

²² *IG* iv² 102, 118, 110, 109. Cf. also A. Burford, *The Greek temple builders at Epidauros* (Liverpool 1969) 176–9 (with her corresponding numbers I, IIA, XVII, XXI) and Meiggs (n. 21) 423–30. The reference to Kenchreai, restored in *IG* iv² 118, may have been used in a general way to describe the route of this timber shipment if the timber actually came through Schoinos, the eastern terminal of the *diolkos*, located further to the north on the Bay of Kenchreai. Upon reaching Schoinos the timber would have been loaded on board ship and taken directly to Epidauros. Naturally, not all timber shipments across the isthmus would have gone over the *diolkos*. Smaller shipments in particular may have been carried over land by wagon and in this case Kenchreai would be the point of embarkation.

²³ *IG* ii² 1672. The route of the shipment is recorded as going from Corinth to Kenchreai to Eleusis, and Meiggs (n. 21) 434, 438, suggests that it may have been transported over the *diolkos* (although he sees the track's purpose as 'primarily to enable the Corinthians to pull warships across the isthmus'). References to Corinth are also found in fragmentary building records from Troizen and Hermione (*IG* iv 823 and 742), indicating the possibility of a similar Corinthian role here as has been recorded at Epidauros and Eleusis.

²⁴ E. Bourget, *Fouilles de Delphes III: Épigraphe IV. Les comptes de IV^e siècles* (Paris 1932) nos. 36 and 41; and J. Bosquet, *Études delphiques*, BCH suppl. 4 (Paris 1977) 91–101.

²⁵ Meiggs (n. 21) 430–3.

²⁶ *IG* iv² 102; Bourget (n. 24) nos. 19, 23, 26; *IG* ii² 1665; *IG* iv² 103; *IG* iv 823; and *IG* iv 742.

²⁷ Even those shipments that originated in Corinthian territory probably made their way to harbor by road since the largest Corinthian quarries used in antiquity were located near the main road connecting Corinth and Kenchreai; see Wiseman (n. 1) 66–7.

²⁸ Those working at the so-called Tile Factory, which was located just north of the city and in operation from the sixth to the fourth century, may have made use of the *diolkos* when making shipments across the Saronic Gulf; see Salmon (n. 1) 33, 121–2.

²⁹ For references and discussion see H. A. Thompson, *Expedition xxii/3* (1980) 15–19, and Burford (n. 22) 182. For the results of an experiment to reproduce roof tiles that were used during the archaic period, see W. Rostoker and E. Gebhard, *JFA* viii (1981) 212–27; the modern replicas each weighed 30 kg and measured 0.65 m long, 0.69 m wide, and 0.04 to 0.05 m thick.

³⁰ See for example Burford (n. 22) 179–82, who discusses the purchase of metals recorded at Epidauros, Delphi, and Eleusis. Of course, metals sought for building projects would represent just a fraction of the overall trade in metals.

³¹ Snodgrass (n. 7) 18, 22–3.

³² *IG* iv² 103. In the records of Hermione (*IG* iv 742) and Eleusis (*IG* ii² 1672), there is also reference to διακάλισις.

was constructed at Kirrha, the port of Delphi, and traces of a similar structure may have been found at the western terminal of the *diolkos*.³³ At its western terminal, a wide stone platform has also been uncovered that provided a place to stack cargoes that had just been transported across the *diolkos* or were awaiting such transport.³⁴ Thus, ships could dock alongside the platform either to load or to unload cargoes—and perhaps both, since it is likely that shipowners completing their trip at the *diolkos* would be anxious to arrange a return shipment if cargoes were at dockside awaiting sea transport.

The trip across the *diolkos* itself probably paralleled to some extent the transport of cargoes on other roadways that were specifically designed to transport building materials. A sled was apparently used to transport stone on a paved road leading down from the Pentelic quarries. There are also references to road making in the Eleusinian accounts. Similarly, the later accounts from Didyma refer to the making of roads leading from the quarries. Road workers also appear in Plutarch's reference to the Periklean building program and in the Propylaia accounts.³⁵ While sleds may also have been used on these roads when transporting heavy materials, reinforced wagons drawn by oxen were perhaps more common.³⁶ However, even with these specially constructed roads there were limitations. At Eleusis, for example, where such roads were available, heavy transport appears to have been restricted to the late summer (between Metageitnion and Boedromion), the driest time of the year; at Epidauros and Delphi, the transport of stone also took place in the summer.³⁷ At this time, the roads were in the best condition and more capable of supporting heavy loads.

Use of the *diolkos*, on the other hand, would have been less restricted. Cargo was probably transported on a wooden platform fitted with wheels or rollers that were guided along the parallel tracks; oxen may have provided the drawing power. This arrangement would have been able to support greater loads than a wagon and move with greater ease than a sled. Its capabilities would have exceeded what was normally possible on land.³⁸ In addition, the *diolkos*' proximity to the sea

eliminated any need to depend on traditional overland transport. Sea-borne cargo could be transferred immediately to the *diolkos* without any intermediate steps. As such, transport of even heavy cargoes across the isthmus would not have been limited to the dry season, and the availability of the *diolkos* for a greater part of the shipping season would have made transport across the isthmus an even more attractive option.

In conclusion, the *diolkos* seems to have been technically successful and made transport across the isthmus more feasible for a wider range of goods. In addition to the occasional transport of boats and even warships, our evidence indicates that the *diolkos* was ideally suited for the transport of marble from east to west and timber from west to east; other cargoes of substantial weight and bulk such as building materials and metals also seem appropriate. Of course, the *diolkos* could and probably did transport a wide variety of less imposing goods as well. Foodstuffs are certainly a possibility. The recent excavation of the Punic Amphora Building in Corinth suggests that pickled or salted fish packed in amphorae were transported through Corinthian territory in both directions during the fifth century; most of the amphorae recovered have been identified as Punic and Chiote.³⁹ Also, it is possible that grain shipments from Italy and Sicily may have reached the Aegean by way of the *diolkos* in the sixth and fifth centuries.⁴⁰ With respect to manufactured goods, Attic pottery may have been shipped in the opposite direction to points west, especially pottery that had been crated in bulk lots. In this regard, the influx of Attic pottery into Italy and Sicily in the early sixth century, shortly after the construction of the *diolkos*, may be more than coincidental.⁴¹ The possibilities are such that it is likely that the *diolkos* was used on a regular basis.⁴²

Whether the Corinthians considered the *diolkos* a financial success, in terms of increased tax revenue, we have no way of knowing. However, later references to the *diolkos* suggest that it was maintained and presumably used long after it was constructed.⁴³ As long as a significant amount of cargo was shipped between points east and west, the *diolkos* probably remained an attractive alternative to the trip around Cape Malea.

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³³ For the use of *μαχάνωμα* and *σφενδύνα* at Kirrha, see Bourget (n. 24) 87–8 and no. 19, and for the remains of wood and bronze and iron nails near the *diolkos*, see N. Verdélis, *Praktika* (1960) 141.

³⁴ Verdélis (n. 33) 136–41, and Wiseman (n. 1) 45.

³⁵ A. K. Orlandos, *Τὰ ὑλικά δομῆς τῶν ἀρχαίων Ἑλλήνων* ii (Athens 1958) 90–2; and *IG* ii² 1672, 1673; A. Rehm, *Didyma* ii (Berlin 1958) nos. 40, 41; *Pl. Per.* xii 7; and *IG* i³ 462. Also see the comments of A. Burford, *EcHistRev* xiii (1960) 12; curiously, Burford refers to the *diolkos* as an example of the road-building capabilities of the Greeks but she also considers (p. 11) that the *diolkos* was built primarily for the movement of ships across the isthmus, not the transport of cargo.

³⁶ In a new study of *IG* ii² 1673 concerning the transport of column drums to Eleusis, G. Raepsaet, *AC* 53 (1984) 101–36, has reconstructed the type of wagon that may have been used for heavy transport. Like Burford (n. 35), Raepsaet makes comparisons between the roadway whose preparation is referred to in this inscription (line 28) and the *diolkos*, and even suggests that part of the road may have been constructed with grooves or tracks, based on his translation of ὑπόνομοι in line 4; however, he too describes the *diolkos* (p. 126) as 'route à travers l'isthme par laquelle on faisait passer les bateaux.'

³⁷ K. Clinton, *ArchEph* (1971) 103, and Burford (n. 35) 12.

³⁸ For estimates of the amount of friction on clay as compared with that on stone roadways, and the reduced power requirements of the latter method, see Cook (n. 4). Also see Raepsaet (n. 36) 130–3.

³⁹ C. K. Williams II, *Hesperia* xlvii (1978) 15–20, xlviii (1979) 107–24, xlix (1980) 108–11.

⁴⁰ That Italy and Sicily enjoyed a reputation for abundant grain supplies is indicated by Hdt. vii 158; Thuc. iii 86, vi 20, vi 90; and Pliny *NH* xviii 65. Also see the comments of L. Gernet, *L'approvisionnement d'Athènes en blé au V^e et au IV^e siècles* (Paris 1909) 312–14.

⁴¹ That Corinth was also a transfer point for pottery being shipped between points east and west is suggested by the so-called Traders' Complex excavated in Corinth, which contained Attic, Chiote, East Greek, Corinthian, Lakonian, and Etruscan pottery dating to the first half of the sixth century; see C. K. Williams II, J. MacIntosh, and J. G. Fisher, *Hesperia* xliii (1974) 14–24, 38–39.

⁴² In the apparent reference to the *diolkos* in Ar. *Thesm.* 643–8, the thrust of the joke depends on the frequent, regular use of the *diolkos*.

⁴³ For the evidence of rebuilding and repair work along the *diolkos* that apparently dates to the fourth century, see Wiseman (n. 1) 43–6.