established as an Athenian magistracy'. The office was established once only. Again, *Ath.Pol.* 41.2: Ion and his colleagues immigrated to Attica; 'then for the first time, *τότε πρῶτον*, the Athenians were divided into the four tribes and established the tribal kings'. The division of people into the four tribes and the establishment of the kings took place once only, and at that exact moment.

But in these last two passages, as Sumner observes, the idea of continuity is also present. The *Hellenotamiai* were established in 478/7 (and *Hellenotamiai* continued to be appointed). The division of Athenians into tribes and the establishment of tribal kings happened, once, in the time of Ion (but successive generations took their places in the tribes and kings continued to exist). The same connotation of permanence can be found in the examples from Plato. Zeno and Parmenides had just then brought Zeno's writings to Athens (and they continued to be available). God imposed form on the elements (and they continued to exist in such a state; perhaps God kept on seeing to it that they retained their forms). God began, just at the specified time, to look after the revolution (and has never given up looking after it).

The combination of one action, fixed at a certain time, and the continuation of the result of that action, is obvious in Androtion F 6. Hipparchus was the first to be ostracized, the law having just then[7] been passed (and it continued to be on the books as a law). Sumner is right in saying that this is not the first of a series of occasions on which such a law was passed, but *τότε πρῶτον* need not imply any such series of occasions, as the examples from Plato show.

So far as concerns Greek idiom, then, *τότε πρῶτον* is neither meaningless or senseless; it is normal Greek.[8]

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[7] I find unconvincing the attempt of Carcopino to interpret *τότε* as meaning 'in that general period': this weakens Androtion's purported words to the point of emptiness (*L'ostracisme athénien*[2] [Paris 1935] 25 ff.; revived by D. Kagan, *Hesperia* xxx [1961] 394).

[8] Keaney, *Historia* xix (1970) 2, points out that *τότε πρῶτον* are found only in manuscripts PABG of Harpocration; the archetype, according to his stemma, will have had *τότε πρώτον*, which is well and truly meaningless. Keaney supposes that *τότε πρῶτον* is either a further corruption or a correction by three scribes. The latter is possible—but it is also possible that *τότε πρῶτον* is the true reading, somehow transmitted, despite its absence from the archetype.

Archaic Greek Trade: Three Conjectures

1. *The Diolkos*

Not much attention is given to the *diolkos* across the Isthmus of Corinth, nor is much known about it. There are a dozen or so explicit or probable references to it in ancient literature,[1] one relevant inscription[2] and some remains of its track.[3] The remains, principally at the west and close to the modern canal,[4] are from a paved roadway with two parallel channels about 1·50 m apart, evidently to hold the wheels of some sort of carrier; and associated pottery and inscribed letters suggest that it was constructed in the late seventh or early sixth century B.C. The written references tell us that the eastern end of the *diolkos* was at Schoinos,[5] that it was said to be 40 stades long,[6] that warships were transported across the Isthmus in 412, 220, 217, 102 and 30 B.C.,[7] that the *diolkos* was in use in the early period of the Roman Empire,[8] and that some ships were too big for it:[9] there is, though, no precise statement of the commercial use of the *diolkos*.

Yet transport of warships is not likely to have been the normal use of the *diolkos*: ancient historical writers were more interested in war than commerce, and warships cannot have needed transporting very frequently.[10] Even then the *diolkos* was not always satisfactory: in 428 B.C. the Spartans could not move their ships across the Isthmus without first preparing *ὁλκοί* for them[11] and in 217 B.C. the larger warships were sent round Malea.[12] Further, Strabo and Pliny, writing in times of peace, imply that currently the *diolkos* was in regular service.[12] It seems then that its main use must have been for commerce.

The original purpose too is likely to have been commercial.[14] If the *diolkos* was constructed around 600 B.C., when Corinth was governed by tyranny, it is hard to think of any defensive or offensive need for so big an undertaking. On its commercial value, though, one particular point is worth noting. Because of its location the *diolkos* could scarcely have served trade to and from the city area of Corinth: for freight coming from or going to

A. M. Snodgrass kindly read my typescript and M. I. Finley and B. B. Shefton drafts of the second and third sections. I am grateful for their comments and especially those of Shefton, who did not agree with me.

[1] See *Corinth* i 50 n.1 and *RE* ix 2258–9: I assume their collections of references are fairly complete.

[2] *Corinth* viii 2, no. 1.

[3] N. M. Verdelis *Ath. Mitt.* lxxi (1956) 51–9 and lxxiii (1958) 140–5; *PAE* 1960, 136–43 and 1962, 48–50.

[4] J. G. Frazer had previously reported remains of a 'tramway' on the east side of the Isthmus (*Pausanias's Description of Greece* iii 5): they have now, it seems, disappeared.

[5] Pliny (*NH* iv 10) and Hesychius (s.v. 'Diolkos') seem to say that the *diolkos* was from Lechaeum to Cenchreae; if so, they were wrong.

[6] Strabo viii 335, though if this is meant as the direct distance across the Isthmus, the *diolkos* would have been rather longer.

[7] Thuc. viii 7–8; Polyb. iv 19.77–9 and v 101.4; *Corinth* viii 2, no. 1; Dio Cass. li 5.2 *Cf.* Thuc. iii 15.1 (preparations in 428 B.C.). Though the *diolkos* is not mentioned, its use on these occasions is assumed generally and reasonably, since it existed earlier and was available later. On the other hand I do not think that the transport of warships across the Isthmus in 883 A.D. (Georgius Phrantzes i 33: in *Corp. Script. Hist. Byz.* xx, ed. Bekker) is likely to have been on the *diolkos*, since by then there had been too long a period of anarchy for a public utility of its kind to have remained serviceable (see also n. 8); still less do I believe G. F. Hertzberg's assertion, for which he gives no evidence, that small ships still used the *diolkos* in the twelfth century A.D. (*Gesch. der Byz.* 306).

[8] Strabo viii 335, *κατὰ τὸν διολκόν, δι' οὗ τὰ πορθμεῖα ὑπερνεωλκοῦσιν ἀπὸ τῆς ἑτέρας εἰς τὴν ἑτέραν θάλατταν*. Pliny (*NH* iv 10) 'Lecheae hinc, Cenchreae illinc angustiarum termini, longo et ancipiti navium ambitu quas magnitudo plaustris transvehi prohibet'. Incidentally, use of the *diolkos* may have ended in 67 B.C.; first, its track is interrupted near its western end by the modern canal, which here was preceded by the cutting for Nero's canal (B. Gerster, *BCH* viii [1884] 225–32) and, secondly, a bridge over a 40–50 m cutting would have been impracticable nor was any trace of a diversion of the *diolkos* observed in the stretches on either side of the interruption, where—unless spoil heaps prevented it—one might expect a diversion to have started.

[9] See n. 8. Pliny is unambiguous, and conceivably Strabo's *πορθμεῖα* were a particular kind of ship (*cf.* perhaps Hdt. vii 25).

[10] The Latin inscription at Corinth (*Corinth* viii 2, no. 1) even describes the transport of a fleet in 102 B.C. as unprecedented.

[11] Thuc. iii 15.1. His *ὁλκοὶ τῶν νεῶν* must, I suppose, have been slipways, by analogy with Hdt. ii 54, where *ὁλκοὶ τῶν νεῶν* survived long after a site had been abandoned (*cf.* also Hdt. ii 159). This implies that the difficulty encountered by the Spartans was one of structure rather than equipment.

[12] Polyb. v 101.4; cf. *fr.* 162.

[13] See n. 8.

[14] *Cf.* C. Roebuck, *Hesp.* xli (1972) 127: he thinks the purpose commercial and fiscal.

the eastern sea Cenchreae was nearer than Schoinos and not much further than the west end of the *diolkos* (reached only after a 40 stade haul), while for freight to or from the west Lechaeum remained the obvious port. So the *diolkos* seems to have been intended only for through traffic, which in the main (I imagine) did not involve Corinthian ships. The principal purpose then of the *diolkos* should have been the collection of tolls from non-Corinthian shipping.

Presumably the *diolkos* was modestly successful, if it was still in use in Strabo's and Pliny's times: upkeep, of course, should not have been exorbitant. Presumably too it was not very successful, or we might expect to have heard more about it, and Schoinos and the nameless western terminal should have became places of some importance.[15] The reasons were, I suspect, technological. First, the roughness of the track and the crudeness of the carriers' wheel system would, I suppose, have set a relatively low limit to the weight of loads that could practicably be transported.[16] Secondly, experts familiar with the Kyrenia ship, a smallish merchant vessel built in the fourth century B.C., consider that it would have been a severe strain on its hull to take it out of the water with its cargo on board:[17] yet the structure of the Kyrenia ship appears to have been typical for Greek and Roman merchant ships[18] and with larger ships of that type the strain on the hull would, I imagine, have been more severe. So it seems to me likely that, when a merchant ship was to use the *diolkos*, there was the extra expense and inconvenience first of unloading it—for ship and cargo to be transported by separate carriers—and at the other end of reloading.[19] It is possible too that sometimes cargoes were transported by themselves on the *diolkos*, to be reloaded on another ship after the crossing, though synchronisation might have been uncertain.[20]

2. *The Distribution of Laconian pottery*

Laconian fine pottery of the sixth century B.C. is easy to recognise and has usually been mentioned in reports of excavations. Its distribution is very wide. In the West it has turned up in Corcyra, South Italy, Sicily, Etruria, Marseilles and Carthage; in the Aegean in Rhodes, Samos, Smyrna (and Sardis), Pitane (and Pergamum) and Kavalla; to the south in Crete, Cyrenaica and Naucratis; and in the East (including Cyprus) perhaps at Ras el Bassit in Syria.[21] So far as I know, it has not been observed round the Black Sea. The quantity of these finds, both absolutely and relatively, is very small, except in Samos and Cyrenaica and perhaps Tarentum.[22]

Plainer Laconian ware was exported too. Of these the kraters and aryballoi have been known as Laconian for a long time, though they are not reported as regularly as the fine ware; but recognition of some other shapes, largely covered with black paint, is recent and it is only at Tocra that they have been studied carefully.[23] There the plain ware was more than four times as plentiful as the fine ware and this does not seem to be exceptional.[24] The distribution seems to be fairly similar to that of the fine ware;[25] in general it is relatively rare and, though it occurs round the Black Sea, it is decidedly rarer there than in the West.[26] The same seems to be true of the Syrian region.[27]

[15] Further, the paving of the track, which is of a softish stone, shows signs of much wear or other deterioration, but—if my memory is right—not of much repairing.

[16] It has been suggested that something more ought to be said about this limit and so I offer a vague surmise. In 412 B.C. it was presumably triremes that were transported on the *diolkos* (Thuc. viii 7–8). In 217 B.C. *hemioliai* and undecked ships were transported, but the cataphracts were sent round the Peloponnese (Polyb. v 101.2–4; cf. *fr.* 162), presumably because they could not be transported; what kind or kinds or warships these cataphracts were is not stated, but one might expect that some were *pentereis*. Yet, according to some students, triremes and *pentereis* could be housed in the same sheds (e.g. J. S. Morrison and R. T. Williams, *Greek Oared Ships* 286, though on 183 D. J. Blackman is non-committal), and consequently their dimensions must have been much the same: if so, the determining factor here for transport on the *diolkos* should be weight—and unladen weight, since warships did not carry cargo. By this reasoning the loading limit on the *diolkos* was between the weight of an empty trireme and that of an empty *penteres;* and though we do not know what those weights were, we do know approximately the dimensions of triremes—about 35 m long and 5m wide (*ibid.* 285). Students more knowledgeable about ships than I am might be able to work out what sizes of merchant ships correspond to the trireme and the *penteres,* allowing first for the trireme being of exceptionally light build and secondly for the lead sheathing of the hull that seems to have been or become usual in merchant ships (K. de Vries in G.F. Bass, *A History of Seafaring* 49). From the data collected by L. Casson (*Ships and Seamanship in the Ancient World* 183–90) my very tentative guess is that merchant ships which could carry a load of around 200 tons could have been transported on the *diolkos* but without their load, and that it would have been a very small ship that was not too heavy when fully laden. This chain of argument is, of course, very tenuous and also assumes that the efficiency of the *diolkos* remained constant.

[17] So G. F. Bass kindly told me. For a short account of the Kyrenia ship see M. L. Katzev in Bass, *op. cit.* 50–2.

[18] Vries in Bass, *op. cit.* 49.

[19] That cargoes had to be unloaded is the opinion also of N. M. Verdelis (*ILN* 19 Oct. 1957, 649–51) and of A. R. Burn (*The Warring States of Greece* 60); but Verdelis's routing of cargoes by way of Lechaeum and Cenchreae is unnecessary and Burn's statement that in favourable winds sails were used to help ships up the gradients seems to me unlikely because of the need for stability. I owe these last two references to A. M. Snodgrass.

[20] 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 ὁλκοί in 428 B.C.

[21] C. M. Stibbe gives a helpful conspectus in *Lakonische Vasenmaler*. For Ras el Bassit see P. Courbin *Rev.Arch.* 1974 175–7—his krater is presumably plain ware, but he says nothing diagnostic about the other Laconian; there was also one piece of Etruscan bucchero. Though I know of no Laconian in Chios, there is rare Chiot imitation of Laconian (E. A. Lane, *BSA* xxxiv 186).

[22] Stibbe (*op cit.*) gives, on my rough count, nearly 120 attributed pieces to Samos, 15 to Tocra and 11 to Tarentum; Naucratis, where the quantity of pottery found was embarrassingly large, gets 17. The exemplary statistics for Megara Hyblaea estimate for a period of two and a half centuries over 15,000 Corinthian pots, over 2000 Attic, and 180 Laconian—mostly plain ware (G. Vallet and F. Villard, *Mégara Hyblaea* ii 9 and 127–9): incidentally, for Etruscan bucchero the figure is 150, which I think should be augmented by some items assigned to 'Ionian bucchero'.

[23] J. W. Hayes in J. Boardman and J. Hayes, *Tocra* i 87–95 and ii 39–41. C. M. Stibbe has in hand a comprehensive study of Laconian plain ware.

[24] Vallet and Villard (*op. cit.* 127) say that plain kraters predominate at Megara Hyblaea and that this is normal in the West (*cf.* T. J. Dunbabin, *Western Greeks* 240—on Sicily). For Tarentum Stibbe observes that the fine ware was relatively infrequent (*Meded* xxxvii [1975] 14).

[25] Hayes, *loc. cit,* has some references; and B. B. Shefton in T. J. Dunbabin, *Perachora* ii 382–5 and 539–40 lists aryballoi and kraters (supplementing P. Mingazzini, *Coll. Castellani* i 186–8). For Tarentum (and some other sites) see Stibbe's paper cited in n. 23.

[26] *Odessus:* krater (*BIA Bulg.* xxx [1967] 168 fig. 16*a*). *Istria:* perhaps two kraters (*Histria* i pls 38. 750 and 89.I.2). *Berezan:* a few kraters and aryballoi (K. F. Kinch, *Vroulia* 127; Leningrad, Inst. of Archaeology, Photo-Archive II, 10060–53043; diary of Skadovsky in Leningrad, State Hermitage Archive 1900.1—dyelo 37). *Olbia:* hydria (in Leningrad). *Cape Tuzla* (Taman peninsula): perhaps an aryballos (N. P. Sorokina, *Tuzlinsky Nekropol* fig. 4.3). *Sinope:* several aryballoi (*JDL* lxxiv [1959] 123 n. 1: C. M. Stibbe tells me that these have now been returned to Sinop) *cf.* also perhaps Y. Boysal, *Arch.Anz.* 1959 20 no. 13. On Odessus, Istria and Olbia I am indebted to B. B. Shefton, for Berezan and Cape Tuzla to J. G. F. Hind. Hind, whose knowledge (often first-hand) of the South Russian finds is exceptionally full, confirms the extreme rarity of Laconian there.

[27] For Ras el Bassit see n. 20 and there may be a few sherds from Al Mina (C. M. Robertson, *JHS* lx [1940] 20, fig. 8 l–o).

Some years ago I suggested that the export in considerable quantity of Greek pottery of a minor school—that is a school other than Corinthian or Attic in their primes—is evidence of direct trade between the place of finding and the home of that school.[28] For Laconia, at least in so far as its export is not considerable, I offer a different explanation. All ships sailing between the Aegean and the West and not using the *diolkos*—and I suppose that because of its limitations they were numerous—and also some ships sailing between the Aegean and Africa regularly passed along the coast of Laconia and for shelter, provisions or trade might have put in at Gytheum or some other Laconian port: there they could have picked up casually a few pieces of Laconian pottery to sell at their destinations. This would account conveniently for the remarkably wide but thin distribution of Laconian wares both in the West and the Aegean and also, since in the sixth century B.C. the Greek West was not likely to have needed much direct contact with the Syrian end of the Mediterranean or the Black Sea, for the much greater rarity of Laconian pottery in those parts. It would be rash to argue further from the relative frequency of Laconian pots in Samos that Samos was busier in the western trade than other Aegean cities; but this is to me more credible than the notion of political and therefore artistic sympathy. So the export of Laconian pottery should not indicate in general any active commerce to or from Laconia in the sixth century and still less any extensive overseas trading by Laconian ships.[29]

3. *The Vix Krater*

The bronze mixing bowl known as the Vix krater[30] was found in a rich and very important burial of the late sixth century B.C. at the foot of Mont Lassois near Châtillon-sur-Seine, more than 300 miles (or about 500 km) north of the Mediterranean coast. The workmanship is Greek of the third quarter of the sixth century B.C. and, because of the style and the alphabet of the instructions for assembling the figures on the neck, probably Laconian (or, if not, Tarentine).[31] It is much the largest Greek krater that has survived, with a height of 164 cm, a maximum diameter of 149 cm and a weight of 208 kg: the largest single component—since it was made in parts—is the body with a height of 127 cm, maximum diameter still of 149 cm and weight of 52 kg. Its condition is excellent. The grave contained other objects of much the same date, notably two Attic cups of clay, one of Droop type and the other plain black.

The first question is where the krater was made—in Laconia (or Tarentum) or by a Laconian (or Tarentine) bronze-worker at Mont Lassois. Some Greek craftsmen, especially sculptors, certainly travelled to execute commissions, but that was in Greek communities and it is unlikely that a bronze-worker of the skill required to make the Vix krater would have reckoned the long journey to Mont Lassois, with or without assistants, worth his time. It is still more unlikely that the krater was the work of an emigrant craftsman: for though it may be inferred from the style and character of some groups of pottery made in Etruria that in the sixth century Greek craftsmen settled there, the number of them seems to have been small, although Etruria offered a large and steady market, nor is there any other trace of the activity or influence of the maker of the Vix krater at or near Mont Lassois. So the probability is that the krater and not the craftsman was imported.

If then the krater was imported, a second question is by what route it reached Mont Lassois. On this students differ. Some seem to argue from the distribution of Greek and Etruscan objects of the period that it came across the Alps from Etruria; others prefer the shorter and easier journey from the French coast, which for much of the way could use the Rhone.[32] For my purpose the choice does not matter, though I shall back the French route.

Another question—and the one which interests me here—is how the krater was acquired. The initial possibilities are by war or peaceably. War is unlikely for several reasons. First, Mont Lassois is very distant for a raid on the Mediterranean coast, and presumably the krater would have been in one of the Greek colonies there. Secondly, it would have been cumbersome loot to carry, and without damage. Thirdly, if the original destination had been some coastal place, the instructions for assembling the components might not have been necessary. Fourthly, looters would hardly have bothered with the clay cups found with the krater. Further, the interval between the making and the burial of the krater was not very long.[33]

For peaceful acquisition there are again two possibilities, that the krater was a gift or a purchase. If it was a gift, as most students seem to accept,[34] it was much too expensive to come from a private trader, to judge by what we know of the resources of Greek traders, and must have been an official or semi-official benefaction from a Greek city. That Greek cities of the Black Sea made benefactions to Thracian and Scythian potentates, on whom they were more or less dependent, is clear enough, and these may well have included luxury vessels of bronze; but the Greek cities of Mediterranean France are hardly likely to have needed to propitiate so distant a power as that of Mont Lassois, either for security against attack or even—supposing they thought so commercially—for trading benefits,[35] nor is there much reason (beyond the krater) for assuming that Mont Lassois was so important.

There is, so far as I can see, no positive objection to the alternative that the Vix krater reached Mont Lassois by purchase, though of course lack of objection is not proof. That Greek traders visited Mont Lassois seems fairly clear,

[28] *JdI* lxxiv (1959) 123.

[29] T. J. Dunbabin once argued that the export of Laconian to Sicily was by way of Corinth, since the finds in Sicily and Perachora were of similar types (*Western Greeks* 240); but the similarity no longer appears peculiar, Laconian finds in the Aegean and Africa are unlikely to have passed through Corinth, it is hard to explain why and how Corinth should have procured Laconian wares to market, and the whole process is unnecessarily complicated.

[30] *Mon. Piot* xlviii 1 (R. Joffroy).

[31] Some students claim the Vix krater for Corinth (but see L. H. Jeffery, *LSAG* 191–2 and 375 on the alphabet). Anyhow, a Corinthian origin would not affect my argument.

[32] So, for instance, Joffroy (*op. cit.* 51–4; *L'Oppidum de Vix* 142–54 and especially 151) is apparently for Etruria and J. Boardman (*The Greeks Overseas*[2] 213) for Marseilles. It is worth considering how the krater was transported overland, even dismantled: it seems to me that it must have been crated and either put in a cart or slung on two poles to be carried by porters.

[33] It could be argued that the krater was looted by a tribe living nearer the coast and by one means or another passed on to Mont Lassois. If so, the risk of damage would have been still greater and the shortness of time becomes still more troublesome.

[34] So, for example, F. Villard, *La Cér. gr. de Marseille* 141–2.

[35] For reasons similar to those given in n.33 it seems unlikely that the krater was a gift to some nearer tribe which was then passed on.

from the presence there of Greek pottery.[36] Even so, the abnormal size and expensiveness of this krater argues very strongly that it could never have been in the stock of an itinerant trader or even of any commercial shop, but must anyhow have been a special order.[37] This implies a complex series of operations. First, the order would have to be placed, with some instructions, at least about its size:[38] this could have been arranged either at Mont Lassois with an itinerant trader or by sending a local representative from Mont Lassois to the coast, presumably to Marseilles. At Marseilles the trader or the representative (or both) would then have had to pass on the order to a ship's captain or a merchant going by ship: an itinerant trader would not be likely to have overseas contacts himself and a native of Mont Lassois would be still more inexperienced. Next the captain or sea-going merchant on arriving at Gytheum (or Tarentum)—neither port necessarily his terminus—would have arranged for the making of the krater in a local bronze workshop. Later, on a return journey, this intermediary would have picked up the krater, shipped it to Marseilles, and delivered it to the itinerant trader or the customer's representative, who finally would have conveyed it to Mont Lassois, taking a craftsman along to assemble the components (unless the trader himself had the necessary skill). Presumably the cost or a large part of it would have been paid by the customer in advance, since the expenses would have been beyond the resources of a Greek trader, merchant or ship's captain; but anyhow there would have to have been a considerable degree of trust and co-operation between the various participants in this complicated transaction, which could hardly have been completed in much less than a year and was liable to the natural risks of death or shipwreck.[39] Such personal relationships must anyhow have been frequent and indeed inevitable in Greek overseas trade, since it was conducted largely by small men, and this could explain the sensitivity of, for instance, the Attic potter Nikosthenes to the Etruscan market without requiring that he should himself have visited Etruria or even dealt directly with anyone active in retail trade there.

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[36] Joffroy, *L'Oppidum de Vix* 120–3—about 25 Greek pots of the sixth century, though these are a very small part of the finds of pottery (*ib.* 152).

[37] C. Picard, *Latomus* xix (1960) 426 n. 1, offhandedly championed an itinerant trader.

[38] B. B. Shefton suggested to me that a native of Mont Lassois would not have ordered a *volute* krater (as the Vix krater is) since that type was then unfamiliar in Gaul; but an itinerant trader could have described it in words and sketches.

[39] Even if the krater was made at Mont Lassois by an imported craftsman, the procedure for procuring him must have been equallly indirect, though the risk of course might have been limited to his person.

Addenda. Add in n. 21 a cup from Amathus in Cyprus (*AIARS* xxvi, 81 no. 184, pl. 18. 9–10); and in n. 27 a simply decorated cup from Kition in Cyprus (*ib.*, 62 no. 16, pl. 3. 5).

Extended Angle Intercolumniations in fifth-century Athenian Ionic

It is a widespread feature of Doric temples that the intercolumniations nearest the angles should be somewhat narrower than normal so as to allow a regular distribution of triglyphs and metopes in the frieze. The nature and working of this adjustment have been widely discussed;[1] but little attention has been given to the contrary arrangement in two Athenian Ionic temples, where the intercolumniations nearest the angles are actually wider than normal. Of the standard handbooks on Greek architecture in English, only that of Dinsmoor notes that the angle intercolumniations of the north porch of the Erechtheion are 0·052 m larger than the central one, and even he does not discuss the fact in his main treatment of the building.[2] He also notes that the angle intercolumniations of the temple by the Ilissos are 0·051 m greater than the central one, but attributes that to later distortion of the building.[3] Shear mentions both these instances in her discussion of the possible works of Kallikrates, and accepts the wider intercolumniations of the Ilissos temple as part of the original design.[4] Following Stevens, she explains this feature in the Erechtheion as intended to allow a regular spacing of the ceiling beams, and suggests that the same explanation may apply to the Ilissos temple too.[5]

A simpler explanation of this at first sight surprising feature may lie in the application of rules of proportion. In both the Ilissos temple and its sister, the temple of Athena Nike on the Akropolis, there are four columns at each end, and so three intercolumniations. In both cases the central intercolumniation is, within a centimetre, equal to one part in three and a half of the stylobate width (Ilissos temple: stylobate width/$3\frac{1}{2}$ = 1·671 m, central intercol. = 1.679 m; Nike temple: stylobate width/$3\frac{1}{2}$ = 1·542 m, central intercol. = 1·5485 m).[6] Similarly in the east porch of the Erechtheion, with its five intercolumniations, the normal intercolumniation equals almost exactly one part in five and a half of the stylobate width (stylobate width/$5\frac{1}{2}$ = 2·115 m, intercol. = 2·113 m). This suggests that the normal intercolumniation was consistently derived from the stylobate width by a rule; that it was related to the stylobate width as one to the number of intercolumniations *plus a half*.[7] The embodiment of such a rule in the north porch of the Erechtheion is less precise (stylobate width/$3\frac{1}{2}$ = 3·062 m, central intercol. = 3·097 m), but the discrepancy, 0·035 m, may be due to rounding out the dimension to a simple number of feet. The foot standard used in the Erechtheion can be reliably determined from the building accounts as about 0·326 m,[8] and 3·097 m is exactly $9\frac{1}{2}$ such feet; if the value of stylobate width/$3\frac{1}{2}$ were calculated to the nearest palm (quarter foot), 3·097 m would be the result.

The question naturally arises why the application of a consistent rule should sometimes give extended angle intercolumniations (as in the Ilissos temple and the north porch of the Erechtheion) and sometimes normal ones (as in the temple of Athena Nike and the east porch of the Erechtheion). The answer is that the effect of such a rule will depend on the distance between the edge of the

[1] E.g. D. S. Robertson, *Greek and Roman Architecture*[2] (1943) 106–9; J. J. Coulton, *Greek Architects at Work* (1977) 62–4.

[2] W. B. Dinsmoor, *The Architecture of Ancient Greece* (1950) (hereafter *AAG*) 340; no discussion *ibid.* 187–95. The feature is not mentioned in the following discussions of the Erechtheion: D. S. Robertson, *op. cit.* (n. 1) 127–35; A. W. Lawrence, *Greek Architecture*[3] (1973) 164–6; G. Gruben, *Die Tempel der Griechen*[2] (1976) 193–206.

[3] *AAG* 339.

[4] *Hesp.* xxxii (1963) 391, 413.

[5] L. D. Caskey *et al.*, *The Erechtheum* (1927) 80; *Hesp.* xxxii (1963) 413.

[6] Figures in this paragraph are from *AAG* 339–40.

[7] Compare the probable use of a similar rule in Doric temples of the same period (*BSA* lxix [1974] 83–4, Rule 3). In terms of the abbreviations used there, the present rule may be expressed as $I = W/(N+\frac{1}{2})$, or, if worked in reverse, $W = I(N+\frac{1}{2})$.

[8] *AAG* 195 n. 1; W. B. Dinsmoor in *Atti del VII Congresso Internazionale di Archeologia Classica* (1961) i 358–9.