sketch of this type.[12] On others the sketch has not been observed or recorded, and on some the final outlines were strongly defined by a bold incised line and any sketching may have been polished away.[13] A comparable technique was employed for the painted stone stelai of Chios and Boeotia a century and more later;[14] for tomb paintings in Italy;[15] and for engraved gems.[16]

It is possible, though I think unlikely, that our stone plaque carried a ground wash before the sketch was made. We may be sure that this was not to be the ultimate background for the figures. On white ground vases, where the ground underlies the figures, the sketch is naturally made over the ground.[17] Here we may assume that the background was painted in, but we cannot tell whether it was dark—like relief sculpture, some painted stelai and red figure vases; or light—like the background of all known Archaic clay or wooden panels.

Whatever the colour involved we can readily envisage the result: a panel painting depicting a Greek mythological scene such as we might expect to see on a vase. We cannot tell whether it was intended as votive or purely decorative (see Dr Roaf's comments above). It seems to be in local stone, so it is not loot from some Greek sanctuary. There are no signs of attachment or provision for hanging visible on the extant fragments. And it is no mere 'doodle' like other Archaic Greek sketches found at Persepolis and discussed by Miss Richter,[18] nor, given its subject and style, can it be a trial for a work to be executed on another piece of stone.

Panel paintings of this type must have been extremely common in late Archaic Greece, but not on stone, or surely some would have been preserved from homeland sites. Our expatriate Greek must have been influenced by local practice of painting on stone. At home he may well have been familiar with figured plaques of fired clay which were made to be used as votives, some for tombs, usually with appropriate scenes upon them. Most, though not all, are from Attica and are in black figure or earlier techniques.[19] For the display of similar clay plaques in purely secular or domestic contexts we have as yet no evidence. There must have been very many more in wood, but we have only the fragments of votive plaques from Pitsa near Corinth,[20] executed on a white ground in a technique like that of the slightly earlier Corinthian vases. Other wooden plaques were probably prepared on a white ground and for this reason alone it is likely that the Persepolis plaque too had a pale background to its figures. Since it is not demonstrably votive, and obviously not funerary, it is precious testimony to the probable appearance of the decorative wooden plaques of the Greek world. It tells us how much like the vase scenes they must have been, and reminds us of that even greater wealth of imagery to which Greeks of the Archaic period were exposed, by which their views of myth were moulded, and in which their artists expressed their narrative skills.

It is of just this period that we begin to have record in ancient writers of the names and works of Greeks painters—not vase painters but panel painters whose works probably resembled our plaque, in its finished state, and possibly were no larger, or not much larger. In other words very much like the familiar vase paintings, but executed on a flat surface. In the only case where we have some description of a painting we can see that this parallel is a fair one. Two sources mention a painting by Kleanthes of Corinth in the Temple of Artemis Alpheioussa near Olympia. Strabo (343) mentions a birth of Athena, and Athenaeus (346 b,c) Poseidon offering (*προσφέρων*) a tunny fish to Zeus in labour. From what we know of Archaic art it is easy to understand that Poseidon was not offering the fish, but merely holding it as his attribute, in a scene of gods attending the birth of Athena such as is familiar on several late Archaic vases. We need not envisage a panel much larger than the Persepolis plaque, or at least with figures any larger than those on vases. If this is the character of late Archaic panel painting, brought vividly before us by these fragments from Persepolis, we can better judge the character of the revolution in scale and composition worked by Polygnotos and his colleagues in the next generation.

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[12] The cock on Antiphanes' stele of about 520: Athens NM 86; G. M. A. Richter, *The Archaic Gravestones of Attica* (London 1961) 40 no. 54.

[13] Cf. *ibid.* fig. 139; contrast figs 160 and 163 where there is no bold outline incision and the sketch is apparently lost. The same sketching problems must have attended the preparation for painting Archaic statuary and architectural features.

[14] Boeotia—A. D. Keramopoullos, *AE* 1920, 1–36; Chios—N. M. Kontoleon, *BCH* lxxi/lxxii (1947/8) 273–301; lxxiii (1949) 384–97.

[15] References in Corbett (n. 11) 18 n. 14; *cf.* M. Napoli, *La Tomba del Tuffatore* (Bari 1970) 100 f.

[16] J. Boardman, *Greek Gems and Finger Rings* (London 1970) 381; *Burlington Mag.* 1969 fig. 33 opp. p. 595; with D. Scarisbrick, *The Ralph Harari Collection of Finger Rings* (London 1977) no. 44.

[17] Corbett, *op. cit.* 18.

[18] *AJA* l (1946) 27 f.

[19] *Cf.* J. Boardman, *BSA* xlix (1954) 183–201 (votive); l (1955) 51–66 (funerary); *JHS* lxxvi (1956) 20–4 (red figure) and 24 f. for later red figure plaques. Unusual plaque techniques (red figure with coral red or white ground) are mentioned in *Athenian Red Figure Vases; Archaic Period* (London 1975) 277, and see A. Greifenhagen in *In Memoriam Otto J. Brendel*, edd. L. Bonfante and H. von Heintze (Mainz 1976) 43–8.

[20] M. Robertson, *History of Greek Art* (London 1975) 120 f., 635 f., pl. 34d; A. K. Orlandos, *EAA* s.v. 'Pitsa'.

The Midnight Planet

Choeroboscus preserves the following notice, which came down to him from Herodian (i 45. 14, ii 743. 24 Lentz):

> *Μεσόνυξ Μεσόνυχος· εἷς τῶν ἑπτὰ πλανήτων παρὰ τοῖς Πυθαγορείοις ὀνομάζεται. μέμνηται Στησίχορος* (PMG 259).

It has been almost entirely overlooked by historians of Greek astronomy. The only published discussion known to me is a short article by P. J. Bicknell in *Apeiron* (Monash University) ii 2 (1968) 10–12.[1] He observes that it is a notice of considerable significance, and he makes some important inferences from it. The only planet mentioned in Hesiod and Homer, or in early poetry generally, is Venus, under the names *Ἕσπερος* and *Ἑωσφόρος*.[2] Bicknell notes that the name Mesonyx must have been chosen 'on analogy with' those names; I would prefer to say, by antithesis to them. Hesperos was the luminary that only appeared in the evening, Heosphoros always presaged the dawn: Mesonyx was the planet that could be seen in the middle of the night.

[1] I owe the reference to Dr Malcolm Davies.

[2] Hes. *Th.* 381, *Il.* xxii 318, xxiii 226, Sappho 104ab, 117B?, Ibyc. 331, Pind. *I.* iv 26; without name, *Od.* xiii 93 f.

There is of course no planet that can *only* be seen in the middle of the night, and no *one* planet with the peculiarity of being visible then. Any of the outer planets, Mars, Jupiter, or Saturn, is equally capable of being visible then. Bicknell infers that only one of these planets had been distinguished at the time when the name Mesonyx was created. But which? He rejects Saturn as being the least brilliant and slowest-moving of the three. 'It might just be Jupiter which is relatively brilliant and striking, but against this identification militates the fact that this planet's west–east motion is also rather slow. Jupiter's revolution takes nearly 12 years. The most likely candidate is Mars which is very brilliant at perihelic opposition and which is observed to circle the zodiac once every 780 days.'

It is true that Mars can occasionally—when it is at its nearest to the sun and to the earth simultaneously—outshine Jupiter, but this only happens every fifteen or seventeen years. Ordinarily Jupiter is the more conspicuous of the two. Further, although Mars does get round the zodiac faster than Jupiter, and so can more quickly be seen to have changed its position relative to the fixed stars, its oppositions—the times when it is in the sky throughout the middle part of the night—are only half as frequent as those of Jupiter. Jupiter's occur at intervals of 399 days, Mars' at intervals of 780 days.[3] This means, roughly speaking, that Jupiter is at opposition every year, and in a different sign of the zodiac each time, Mars only every other year, and then usually less bright than Jupiter. If Mesonyx was one of the two, it is much more likely to have been Jupiter. Some comparative evidence may be noted in passing. It is reported of the Hottentots that they know the Morning and Evening Stars to be the same, but that they sometimes confuse Jupiter with Venus and call it 'the Middle Star' when it is seen 'in the middle of the sky'.[4] And in Egypt, from the time of the Nineteenth Dynasty, Jupiter was designated 'the Star of the Southern Sky', Mars and Saturn being given, presumably for schematic reasons, the complementary names 'Eastern Star of Heaven' and 'Western Star of Heaven', or vice versa.[5]

The place of Mesonyx in the history of Greek astronomy must now be considered. Obviously it was not, to begin with, *εἷς τῶν ἑπτὰ πλανήτων*, as our source has it: it belongs to a stage before the distinct identification of Mars, Jupiter, and Saturn, which together with Mercury, Venus, and the sun and moon make up the classical heptad. These planets were all distinguished by the mid fourth century B.C. at the latest (see below). It is satisfactory that Mesonyx is attributed to Stesichorus, who is certainly earlier than that, and to 'the Pythagoreans', who may be.[6] A simple account of the progress of knowledge about the planets, in the manner of Burnet, but including Mesonyx, might run as follows:

'In the time of Hesiod and Homer only Venus had been recognized, and it was still taken to be two separate bodies, the Morning Star and the Evening Star. In the sixth century the next in brightness, Jupiter, was discovered, and given the complementary title of the Midnight Star. At about the same time, or a little later, it was realized that Hesperos and Heosphoros were identical. Continued observation of the sky over the next three or four generations added Mars, Saturn, and Mercury to the number of the known planets, so that by the time of Eudoxus the solar system as known to antiquity was complete.'

Such an account would be in accord with the ancient evidence, but thoroughly implausible. Firstly, there is no proof that the identity of the Morning and Evening Stars was unknown or unsuspected in the time of Hesiod and Homer. We ourselves still use those designations without thinking that they are different planets. Hesiod makes Dawn the mother of Heosphoros and of the stars, making no separate provision for Hesperos.[7] Only when people started setting forth cosmologies in which planets were distinguished as independent bodies was it bound to become clear whether they regarded Venus as one or two, and from the beginning she appeared in them as one: so in Parmenides (D.L. viii 14, ix 23; Aët. ii 15.7), and in whatever Pythagorean system is responsible for the attribution of the discovery to Pythagoras (Apollod. *FGrH* 244 F 91, Plin. *NH* ii 37, D.L. *locc. citt.*). Perhaps it was Italiote interest in such systems that prompted Ibycus to use the names Hesperos and Heosphoros together of the one luminary.[8]

Secondly there is no proof, and it is intrinsically unlikely, that Jupiter was not discovered till the sixth century. It is much brighter than the fixed stars which the Greeks used for navigation and for determining the seasons. They simply cannot have failed to see it when it was in the sky, as it was for some months every year, and if they did not attempt to tell the date by it, it was because they knew it to be useless for that purpose, as it did not appear in the same place at a given time as Sirius or Arcturus did. They must sometimes have noticed Mars and Saturn too—even Saturn, at its brightest, is brighter than any fixed star of the northern hemisphere—and known the same about them. What they did not do, it seems, was to keep a systematic watch on any of these objects in such a way as to establish their identities at successive oppositions or determine just how many of them there were. The name Mesonyx, which betrays a considerable vagueness concerning the behaviour of planets, may well have been bestowed haphazardly on different planets on different occasions.

There are many signs of an increased theoretical interest in planets in the second half of the sixth century and the first half of the fifth, connected with the interest in cosmology generally. But they are treated, so far as we can see, as an open class rather than as distinct individuals. Anaximenes, according to an uncertain emendation of an unreliable report, taught that the stars in general were fixed like nails in the firmament, but that there were some floating like leaves—presumably these were the planets.[9] The disciples of Pythagoras told each other, 'The planets

[3] There is a confusion in Bicknell's account. 780 days is Mars' synodic period, not its sidereal period, which is 687 days.

[4] M. P. Nilsson, *Primitive Time-Reckoning* (Lund 1920) 120, citing L. Schulze, *Aus Namaland und Kalahari* (1907) 367 ff.

[5] H. Brugsch, *Thes. Inscr. Aeg.* i 68 f.; *Aegyptologie* (Leipzig 1889) 336.

[6] It is difficult to say from what source Herodian would have got information about Pythagoreans. Epicharmus might be a possibility. It is inconceivable that Stesichorus himself referred to Pythagoras or Pythagoreans.

[7] *Th.* 381 f. See further Wilamowitz, *Hermes* xviii (1883) 417–20=*Kl. Schr.* i 131–4.

[8] *PMG* 331 *συνήγαγε* or *εἰς ἓν συνέστειλε τὰς προσηγορίας*. See further W. Burkert, *Lore and Science in Ancient Pythagoreanism* (Cambridge Mass. 1972) 307. Burkert wrongly infers from Callimachus *fr.* 442 (D.L. ix 23) the existence of a Pythagorean poem which included mention of Venus. *Καλλίμαχος δέ φησι μὴ εἶναι αὐτοῦ τὸ ποίημα* is a detached scrap of information concerning Parmenides, unconnected with what precedes. Pfeiffer too misinterpreted the passage.

[9] Aët. ii 14.3. See my *Early Greek Philosophy and the Orient* (Oxford 1971) 102–4.

are Persephone's dogs'.[10] Alcmeon noted that the planets move eastwards against the stars.[11] This is a valid generalization only about the outer planets, so evidently it was understood by this time that there were more planets than Venus and Mesonyx. Clearly by 500 some systematic observation has been taking place. Parmenides separated Venus from the other planets by placing it alone below the sun.[12] The reason is that it never goes more than a certain distance from the sun. The same is true of Mercury, so it had presumably not yet been identified; it is notoriously difficult to see. Of Empedocles' doctrine on planets we hear only *Ἐμπεδοκλῆς τοὺς μὲν ἀπλανεῖς ἀστέρας συνδεδέσθαι τῷ κρυστάλλῳ, τοὺς δὲ πλάνητας ἀνεῖσθαι.*[13]

Some systematic observation, then, but not yet a definitive register of planets, and no evidence that the name Mesonyx, after losing its credit, has been replaced by other individual names. A further element of uncertainty was contributed by the occasional appearance of comets. If they had not been taken into account before 467 B.C., the appearance of a large, fiery comet for 75 days in that year[14] certainly brought them into the field of discussion. Anaxagoras explained them as a conjunction of planets.[15] He can hardly have meant, of known planets: it would seem that he conceived there to be an indefinite number of planets in the sky, only a few of which were known. Hippocrates of Chios, his pupil Aeschylus, and certain Pythagoreans held that there was only one comet, and that it was a planet which only appeared at long intervals.[16] Aristotle brings several counter-arguments, among which is that 'often there have been more than one comet at the same time' ('often' must be an exaggeration). The astrological writer Apollonius of Myndos (*ap.* Sen. *QN* vii 17) argued from differences of size, shape, and colour that it is not the same comet that is seen on different occasions. I mention these arguments because one can imagine similar ones being used in earlier generations to establish that there was more than one 'Mesonyx'.

No further advance is detectable when we come to Democritus, who is said to have written *περὶ τῶν πλανήτων* (D.L. ix 46). Like Parmenides, he had only Venus below the sun; and he adopted Anaxagoras' explanation of comets.[17] So he would seem to have recognized one inner planet, Venus, and an indefinite number of outer ones, which were almost certainly still without names. The author of the *Epinomis* knows no names for planets other than Venus, only the *ἐπωνυμίαι* (as he calls them) derived from the Babylonian system, *Ἑρμοῦ ἀστήρ, Ἄρεως ἀστήρ*, etc.[18] These divine cognomina must have come in together with the knowledge (or doctrine) that there were five planets, neither more nor less. They are first attested in Eudoxus and Plato, and it is Eudoxus whom Seneca credits with introducing (from Egypt) knowledge of the motions of the five planets.[19] It is very credible that Eudoxus should have introduced the Babylonian system of names.[20] The only difficulty is that if we accept Aëtius' ascription to Philolaus of the 'Pythagorean' cosmology described by Aristotle,[21] we accept the existence of a pre-Eudoxan system in which exactly five visible planets are recognized. The ascription is, of course, the subject of a long-standing controversy, into which I do not propose to enter.

Whoever devised the 'Philolaic' system, it seems likely that he had individual names for his five planets—as he did for the central fire, and the invisible Antichthon—and we cannot say what these could have been if not *Διὸς ἀστήρ κτλ*. In any case we may contrast the closed dogmatism of this system, and the Babylonian–Eudoxan system, with the uncertain empiricism of the Ionian tradition. Mesonyx represents the one early Greek attempt to pin down the wandering stars of the night. Once it was established that several of them qualified for the appellation, it became useless. The confidence to identify the various planets and provide new names for them did not return until exact knowledge, founded on centuries of observation, was brought from abroad.

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[10] Porph. *VP* 41 = Arist. *fr.* 196; West (n. 9) 215 f.

[11] Aët. ii 16.2–3 = DK 24 A 4.

[12] Aët. ii 15.7 = DK 28 A 40a. We do not understand his cosmology well enough to say whether he treated other planets individually.

[13] Aët. ii 13.11 = DK 31 A 54.

[14] Daimachus (*FGrH* 65 F 8) *ap.* Plut. *Lys.* 12; cf. Plin. *NH* ii 149, Sen. *QN* vii 5. 3. Pliny's date of Ol. 78/2 = 467/6 agrees with Marm. Par. 239 A 57 (468/7), and is supported by the Chinese *Shih Chi*, which records the appearance of a comet in 467 (Ho Peng Yoke, *Vistas in Astronomy* v [1962] 142, no. 13).

[15] DK 59 A 1 § 9 and A 81. Democritus, who repeated this theory, said that some *ἀστέρες* had been seen at the dissolution of comets (Arist. *Meteor.* 343b25): comets do occasionally have a double or multiple nucleus, and if the comet of 467 presented this appearance during part of its period of visibility, Anaxagoras' theory was a natural one.

[16] Arist. *Meteor.* 342b29 ff. = DK 42 A 5; Aet. iii 2.1; O. Gilbert, *Die meteorologischen Theorien des griechischen Altertums* (Leipzig 1907) 642 ff.

[17] Aët. ii 15.3 (*Placita*) = DK 68 A 86; A 92.

[18] 986e–7c. *Cf.* Gundel, *RE* xx 2 (1950) 2025, 2029; Burkert (n. 8) 301 n. 9. The names *Στίλβων, Πυρόεις, Φαέθων, Φαίνων* are Hellenistic, the earliest evidence for them being dated to 265 (Ptolemy *Almagest* 9. 10 p. 288 Heib.). See Cumont, *Ant. Class.* iv (1935) 19 ff.; Gundel, 2030 (where the date is wrongly given as 264).

[19] Eudoxus D 6, F 123–4 Lasserre; Pl. *Tim.* 38d; *Epin. loc. cit.*; Sen. *QN* vii 3.2.

[20] *Cf.* Cumont (n. 18) 12; Gundel 2031. The Persians too at some date adopted the Babylonian system; see B. L. van der Waerden, *Science Awakening* ii (Leyden & New York 1974) 86 ff.

[21] *De caelo* 293a18 ff. and *fr.* 204, DK 58 B 37; Aët. ii 7.7 = DK 44 A 16; and other passages. See Guthrie, *History of Greek Philosophy* i (Cambridge 1962) 282 ff.; Burkert (n. 8) 231 ff., 337 ff.

The Tribes of the Thirty Tyrants

Through the kindness of D. M. Lewis I was recently able to study a photocopy of R. Loeper, 'The Thirty Tyrants', *Zhurnal Ministerstva Narodnago Prosveshcheniya* (May 1896) 90–101—an examination, principally, of the list of the Thirty in Xen. *Hell.* ii 3.2.[1] It seems worthwhile to publicise the outcome of this scrutiny, for four reasons: (a) Since its first appearance 80 years ago Loeper's main thesis—albeit in simplified form: see (c), and below—has exerted enormous influence upon students of prosopography, of the political organisation of post-Kleisthenic Attika, and of the regime of the Thirty.[2]

[1] Hereafter 'Loeper'. D. M. Lewis and J. K. Davies were good enough to comment on earlier drafts of what follows, which naturally resulted in very substantial improvements; but I must exonerate them from responsibility for either the formation or the expression of my views.

[2] E.g. J. Kirchner, *Prosopographica Attica* (Berlin 1901–3) *passim*; Th. Lenschau, *οἱ τριάκοντα*, *RE* vi A.2 (1937) 2364; C. Hignett, *A History of the Athenian Constitution* (Oxford 1952) 288 n. 1; D. M. Lewis, *JHS* lxxxi (1961) 121; J. K. Davies, *Athenian Propertied Families 600–300 B.C.* (Oxford 1971) *passim* (hereafter 'Davies').