

only that he knew that lightning appears around tornadoes and *concluded* that it is also present in the cloud. It might be a valid objection if he were known to be trying to argue from direct knowledge of the facts (which he had misinterpreted). But even if he were appealing to facts, the objection need not be fatal, for the facts apparently could have provided spectacular confirmation of the analogy. Because of their extreme violence it has been impossible to establish reliable, detailed data about what happens inside tornadoes, but a few eyewitnesses have been in 'the uncomfortable situation of looking up such a funnel' and have lived to tell the tale.³

A most lucid and graphic account of a tornado was given by a Kansas farmer, Will Keller, who escaped unscathed even though a tornado passed directly over him. About four o'clock on the afternoon of June 22, 1928, Keller noticed greenish black clouds in the southwest. Suspecting a tornado, he watched and soon could see that not one but three tornadoes had developed. Two looked like ropes hanging from the clouds, but the closest, the one bearing down on him, had a real funnel shape. After hurrying his family into their cyclone cellar, Keller stopped in the doorway for one last look.

He saw the cloud coming steadily on and saw that the end was rising gradually above the ground. In what seemed like a long time but probably was only a few seconds, Keller realised that the great funnel was hanging directly over him. All wind had ceased, and a pungent odour prevailed. A screaming, screeching sound poured from the end of the funnel, and Keller, to his astonishment, could see up into the very interior of the vortex. The circular opening, which he judged to be between fifty and one hundred feet across and to extend upward at least one-half mile, was brilliantly lighted by lightning zigzagging from side to side. Small twisters formed and writhed around inside the rim of the tornado.

A similar experience with a Texas tornado was had by Roy S. Hall, a retired U.S. Army Captain, in May, 1948, and this description of the inside of the funnel—the flashing lightning giving a shimmering fluorescent glow, the terrific whirling, and the horrendous roar—is almost identical with the earlier description. In one respect, however, Hall's report adds a very interesting detail. As he looked up into the funnel, it appeared that the whole column was composed of rings or layers mounted one on top of the other much in the manner of a stack of automobile tires at a service station. If a higher ring moved laterally, the ring immediately below slipped over to a position underneath again, and this rippling motion continued through the funnel.

³ Clyde Orr, Jr., *Between Earth and Space* (New York, 1959) 58 f.

This does nothing, of course, to change the probability that Anaximander would have *inferred* the existence of internal fire. Tornadoes (to say nothing of opportunities to look into their interior) are rare in the eastern Mediterranean, and his own robust imagination would be quite up to the task of supplying missing data. He might have received knowledge of external lightning at first hand or from popular weather lore. But given the vast store of oral information upon which he could draw, it is at least possible that he had also heard an account going back to someone who had seen that fire not only accompanies but fills funnel clouds. It is, in any case, too much to say that the idea could not have been suggested by actual experience. And if Anaximander did have tornadoes in mind, we should credit the analogy between luminous heavenly bodies and funnel clouds lit at the bottom with greater consistency than it might seem to have.

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'Epoiesen' on Greek Vases: Other Considerations

Professor R. M. Cook has performed a valuable service by raising again the question of the meaning of this word in this context.¹ He finds that the weight of argument goes against the view that it means 'fashioned with his own hands,' in favour of its implying ownership of the workshop from which the vessel issued. In the end I disagree with Professor Cook, but the evidence is difficult to evaluate and appears contradictory, and certainly does not justify an unquestioning acceptance of the first interpretation. There are perhaps a few more general observations to be made, and a few points on which his remarks require modification.

1. The position of those who interpret the word as 'fashioned' is not always quite so unquestioning as he seems to suggest. Beazley wrote in *Potter and Painter in Ancient Athens* (1944): 'Two explanations have been offered for the epoiese-signature. One, that it gives the name of the potter, the man who fashioned the vase; the other, that it gives no more than the owner of the establishment from which the vase came. At one time I held it more prudent to adopt the second explanation: but I now believe that, *in general*, the first explanation is the right one: *Ευφρωνιος εποισεν* means that Euphronios fashioned the vase with his own hands.'²

2. Professor Cook writes that he knows only three vases which bear the same name with both *egrapsen* and *epoiesen*: two by Exekias and one by Douris. I

¹ *JHS* xci (1971) 137 f.

² 25 f. Beazley's italics.

know of one other certain case, by Myson;³ a second virtually certain, by Epiktetos;⁴ and a third possible, even probable, by Nearchos.⁵ All three are dedications from the Acropolis, and the two red-figure pieces are worth further consideration in this context. The Myson is his usual shape, a column-krater, but an unusual small model.⁶ The inscription is written in very large if not very competent letters across one side of the black neck; a most unusual scheme. On one side⁷ Athena, seated and extending a phiale (perhaps, as Langlotz suggests, this is thought of as a statue), is approached by a wreathed youth holding sprays; on the other Athena stands behind a column and an altar on which lie sprays, and is approached by a male figure (the head is missing) in a himation. One is tempted to think that the vase was dedicated by Myson, and that the worshipper on each side is intended as a self-portrait.⁸

The Epiktetos is a plate, and bore a figure of Athena Promachos.⁹ The plate is the painter's 'favourite' shape—not the shape he used most often: there are three plates listed in *ARV*² against eighty-four cups (including in each case one lost signed work of which no picture survives); but the shape on which he consistently produced his finest work. Here again one might think of a vase painted for personal dedication. If *epoiesen* in these cases is the owner's mark, a suitable occasion might be the moment when the painter acquired his own establishment. *Epoiesen*-inscriptions with other names occur frequently in Epiktetos' work, both early in his career (Andokides, Hischylos, Nikosthenes, Pamphaios) and late (Python, Pistoxenos); but a business of his own might have been a brief venture

³ *ARV*² 240, no. 42; Athens Acr. 806, Langlotz pl. 72.

⁴ *ARV*² 78, no. 102; Athens Acr. 6, Langlotz pl. 2. The end of *εποισεν* and the beginning of *εγγραφσεν* are missing, with the name or *και* between them; but the small remains of the figure and the well-preserved and beautiful pattern-work leave little doubt that the name Epiktetos covers the second verb as well.

⁵ *ABV* 82, no. 1; Athens Acr. 611, Graef pl. 36. *Νεαρχος μ'εγγραφσεν κα[ποισεν]*. Possible alternative restorations would be *κα[ι ανεθεκεν]*; or even *εγγραφσεν κα[λος]*; cf. another Acropolis fragment (*ABV* 170, no. 2; Acr. II 833) with *Πριαπος εποισεν καλος*; and a lip-cup (*ABV* 83, middle) has inscriptions on the two sides restored as *Νεαρχος [εποισε]ν εν* and *Νεαρχος επιοισε[ν εν]*, though I suppose the verb in the first could have been *εγγραφσεν*, and the name in the second could have been another.

⁶ Refs. above, n. 3.

⁷ Perhaps defined as the front by the inscription; but the neck on the other side appears to be largely missing, and there may have been something else there.

⁸ Pottier in *Mon. Piot* xxix 185, makes this suggestion, and Langlotz quotes him.

⁹ Refs. above, n. 4.

which failed. On the other hand, if *epoiesen* means 'shaped' it could well be that a vase-painter dedicating a piece to Athena might feel that it should be 'all his own work'.¹⁰ A mid-sixth century kantharos, in very fine style, from the Acropolis bears a fragmentary dedication to Athena which ends *αυτος ποι[εσας]*.¹¹ Can this possibly mean anything but that the dedicator fashioned the vase with his own hands?

3. Cook says that 'the signatures are regularly painted and apparently by the same hand as any other inscriptions on the pot'. This seems to be true, but more work needs doing on handwriting.¹² I once noticed that in some of the signatures of Brygos, written in black on the handle, the rho had no tail, while a tailed rho was found in the red inscriptions in the field of the same cups. I began to develop a theory that Brygos, not the painter, put on his own signature; but then noticed that the Brygos-inscription in black on the foot of a cup of unusual form in London had a tailed rho, while the rhos in the red inscriptions in the field were tailless. In fact some of the handle-inscriptions have the tailed rho too; the painter was just inconsistent. I note these haphazard observations merely to draw attention to a field which needs more work.¹³

4. I agree with Cook that the fact that in several cases a series of vases bearing one *epoiesen*-signature has been shown to have been shaped by one man is no conclusive argument. Some thirty cups and several other vases bear the inscription *hieron epoiesen*. All but two of the cups were decorated by one man, whose name we know from one of the other vessels with the Hieron-inscription, Makron. All the cups seem to have been shaped by one man, who also shaped dozens of others, likewise decorated by

¹⁰ The plate would presumably be a comparatively easy form to shape, certainly much easier than the cup. None of Epiktetos' other plates has an *epoiesen*-signature. It would be interesting to study the details of shape of the Acropolis fragments and see if they correspond to those of any or all of the others. On nos. 92-8 of the list in *ARV*² the word *εγραφσεν* is written *εγγραφσεν*, as often in the painter's early work; on no. 91 it is written *εγγραφσεν*, as it is on no. 102, the Acropolis piece.

¹¹ *ABV* 347, middle; Acr. 2134, Graef pl. 94 and p. 215; Pfuhl, *MuZ* fig. 235.

¹² I believe that H. R. Immerwahr is undertaking this important task. See Postscript, 2.

¹³ On the Agora cup P 24113 (*ARV*² 213, no. 242) the rhos in both the *epoiesen*-signature (Gorgos) on the interior, and the *kalos*-inscription (Krates) on the exterior, are tailed. I cannot find a tailed rho anywhere in the numerous inscriptions on vases ascribed to the Berlin Painter. I should have noticed this adverse (though not conclusive) evidence when arguing for the identity of the Berlin Painter with the Gorgos Painter and even with Gorgos himself (*AJA* lxii [1958] 55-66).

Makron; but until we know the meaning of *epoiesen* it is begging the question to identify the shaper as Hieron: an owner Hieron, who regularly employed one painter, Makron, and one potter, whether himself or a nameless other, is equally possible. That both Hieron and the shaper evidently went on working after Makron had stopped shows that in this case the painter cannot have been the shaper, but still does not identify the other two.

5. Cook sees a semantic objection to interpreting *epoiesen* as 'shaped', applied to a vase. This is interesting, and he makes two good points, both of which I am sure are correct in themselves: that *πλάττω* would be a more accurate word than *ποιῶ* for shaping a vase; and that, if *epoiesen* on a painted vase was understood as meaning 'made with his hands' it would naturally be taken to mean 'made completely', i.e. shaped and painted. Neither argument, however, appears to me conclusive. *ποιῶ* is a loose word, certainly, but it is one very commonly used by craftsmen: by a sculptor, whether he had hewn his work from stone or gone through the complex processes of modelling, moulding and casting to produce a bronze; by a gem-engraver; by a mosaicist. The carpenter who constructs a bed may be called *κλινοπήξ* or *κλινοπηγρός*, but also *κλινουργός* or *κλινοποιός* and I cannot feel that the word *epoiesen* need cause any surprise if applied to the shaping of a pot. One might have expected the marble-sculptor or the gem-engraver to use *γλύφω*, but *ποιῶ* is what one normally finds. Similarly, although, if *epoiesen* means 'fashioned', *hieron epoiesen* perhaps ought to mean 'this painted vessel is entirely Hieron's work', it would have been a pedantic potter who would have written, or got his painter to write, *επλασεν*. I very much doubt if Praxiteles hesitated to put *Πραξιτέλης ἐποίησεν* on the bases of those (his favourite) statues which had been coloured by the painter Nikias.¹⁴

6. This use of the word on other artefacts seems to me the strongest—and a very strong—argument for the view that *epoiesen* on a vase means 'made with his hands'. I find it very hard indeed not to think that a Greek who saw the vase supported by the figure of a mounted Amazon, with the inscription *Σοταδης ἐποίησεν*, would have supposed Sotades to be the craftsman who created it; nor can I think that he would have been wrong. But then, does the inscription *Σοτ[α]δες ἐποίησεν* (his spelling varies; presumably the 'ο' too was really long, as indeed he makes it in yet another signature) on a little cup of marvellously fine make mean something different? or *Σοταδες ἐποίησεν* on a good but less outstanding kantharos?¹⁵ Where does one draw the line?

Nevertheless I find that a residue of doubt remains.

¹⁴ Pliny *NH* xxxv 133.

¹⁵ Amazon-vase: *ARV*² 772, no. θ; cup: *ARV*² 763, no. ι; kantharos: *ARV*² 764, no. ζ; all with refs.; long 'ο': *ARV*² 772, no. ζ (fr. of sphinx-rhyton in Villa Giulia).

The case of Euphronios is difficult. We do not know enough about the scale of values of the time, or about workshop conditions and practice, to be quite sure that a man might not change from painter to shaper and continue to make good money; but a change from painter to workshop-owner does seem easier. So with Nikosthenes. Again, I am not sure if we know enough for the argument from the number of signed pots to be very compelling, but the incidence of signatures of Nikosthenes (and of Pamphaios) does somehow look more like the imprint of a workshop than an individual craftsman's record. This, however is subjective, imponderable; I attach little importance to it. Then there are the two band-cups with two *epoiesen*-signatures each: Nikosthenes and Anakles; Archikles and Glaukytes. Cook is right, surely, that these cannot both be shapers. As partners in ownership it is less difficult, though even then it is a funny way of expressing it; or of expressing a transfer of ownership: 'Nikosthenes is taking over Anakles' business'.¹⁶ These paired signatures are in fact a funny phenomenon however you explain them, and this makes me loth to make them the basis for any general theory. They might even be jokes: a bored painter putting on the names of any two of his companions to confuse the poor Etruscan who would buy the cup.¹⁷

Indeed, jokes apart, are we perhaps trying to discern in the signatures on Greek vases a *rationale* which is not there? One starts with the expectation that there will have been some purpose in signing a vase; but a definable purpose would surely leave a detectable pattern and the signing-practice on Greek pottery seems to be totally haphazard. Take, for example, five late archaic cup-painters, to each of whom a considerable number of cups and some other vases have been attributed.¹⁸ Onesimos, with 132 cups or cup-fragments in his list, has his own name on one, *Ευφρονιος ἐποίησεν* on seven, probably eight; no other *epoiesen*-signature, and no signature of any kind on any of the five pieces of other shapes. The Antiphon Painter, with 91 cups or cup-fragments and two other pieces, puts no signatures of any kind, and the same is true of the 114 cups or cup-fragments and one other piece listed as in his manner. On 170 cups or cup-fragments listed under the Brygos Painter, there is no painter's name, five occurrences of *Βρυγος ἐποίησεν*, no other *epoiesen*-signature, and no

¹⁶ A suggestion on these lines is made by Beazley *Potter and Painter* 27.

¹⁷ Cf. Beazley *Potter and Painter* 21: 'Of course the writer of the Sosias inscription need not have been the man he says he was'; but that is an inscription of a different kind—a rude graffito.

¹⁸ For convenience I use the lists as given in *ARV*², without taking account of Addenda or *Paralipomena*. I have, however, noticed *bis*-numbers and an occasional *vacat*, so that my figures are not always exactly what one would expect from the serial numbers in the lists.

signature of any kind on the 47 other pieces in the list. Douris, on 254 cups or cup-fragments, has 35 signatures of his own as painter, and on 26 vases of other shapes four more. On two of the other vases (one with his *egrapsen*-signature, one not) he has his own name with *epoiesen*; no other *epoiesen*-signature on vases other than cups, but on three of his signed cups he has *Πυθον εποισεν* and on one *Καλιαδες εποισεν*, and on an unsigned one an *epoiesen*-signature of Kleophrades. The majority of his cups are by the same potter as those with the *epoiesen*-signature of Python. Makron, with 332 cups or cup-fragments has *hieron εποισεν* on 28, his own name on none; the *epoiesen*-signature of Hieron on three pieces of other shapes and his own with *egrapsen* on one of these, perhaps on another without Hieron's name; no other *epoiesen*-signature on cups or other shapes.

These five painters are linked in various ways: cups, for instance, made by the same potter as those with the *epoiesen*-signature of Euphronios are found not only in Onesimos' list but in those of Douris, the Antiphon Painter and the Foundry Painter who was a close companion of the Brygos Painter. They were working at the same time and in the same circumstances. The uncoordinable variety of their signing-habits can only reflect personal whim, whether the person whose whim is reflected was painter, shaper or employer; and even those who record names most industriously—Douris his own and Makron (presumably) Hieron's—do so only on a small proportion of their output. The fact that signatures in both forms occur much more frequently on cups than on other shapes is surely a tradition stemming from the time of the Little Master cups, where inscriptions were a central part of the decorative scheme; and inscriptions were incorporated in the decorative scheme there because this type of cup was created in a time and circle—that of Kleitias and Ergotimos—where, as we see from their masterpiece the François vase, the written word was a passion. If the names of Nikosthenes and Pamphaios really signified a firm rather than a shaper, then in these cases there might possibly have been some commercial motive for the signature; but had it been so one would expect the usage to have been much more general and consistent.

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POSTSCRIPT. 1. Mr J. Boardman draws my attention to two further documents: (a) *ABV* 349, bottom, Oxford 187, *εκεραμευσεν εμε Οικοφελος Οικοφλης εμ' εγραψεν*. This shows that a fashioner might use a more precise word than *ποιῶ*, but not that he need. (b) *Paralipomena* 69 f., Boston 61.1073, *Νεανδρο[ς] επο[ι]ε[ν] σεν ενγε παραδελις μηδι να(ι)χι ναι με κτλ*—'surely painter pride' (Boardman). 2. Note 12 above. See *Acta of the Fifth Epigraphic Congress 1967* 53–60 Henry R. Immerwahr, 'A projected corpus of Attic vase inscriptions'.

Musical Drinking-Cups

(PLATE XXV)

B. Shefton and M. Vickers recently called attention to a kind of drinking-cup having clay pellets inside the hollow rim of the foot, or inside the hollow lip, which rattle when the cup is moved.¹ The examples noted belong in part to the beginning of the fifth century, in part to the mid-fourth.

A cup of the earlier series (Oslo University ES 36266, *ex Hope*) appeared in *CV Norway* (1) pl. 50, 2. X-ray photographs provided by the laboratory of the Historical Museum, Oslo, can now supplement the description; comparison with the published X-rays of other rattle-cups shows interesting variety in the preparation of such vases. There are nine small pellets in the channel inside the foot. They appear to be of uniform size and regular shape, so it is perhaps not likely that any got in by accident later, although there is an unplugged hole (compare the foot of the cup by Skythes in Toronto, Vickers, pl. 5, 2). In our *CV* publication the open hole was interpreted as a convenient solution to the combined problems of trapping the pellets and letting the air out, on the theory that the pellets had been previously fired and would not shrink in the kiln as the cup and the hole would. The X-ray reveals an unexpected second hole placed some 120° away from the other and carefully stoppered. No obvious parallel comes to mind except for the cat-hole and kitten-hole in the old story, which is not illuminating; one might cautiously conclude that in the case of one potter at least, the process of preparing a rattle-cup was still a matter for experiment.²

Only one other rattle-cup was known to me before Shefton's and Vickers' notes appeared. It is in Schwerin Museum (no. 746), where it puzzled participants in the 1966 vase-congress. *CV* presentation of the vase, which fits into the younger of Vickers' series, should be imminent.

Both authors comment on the art of firing hollow objects without leaving a vent-hole for gases to escape. Some of the best, and earliest, instances of the successful practice of this technique in Greece are to be found among votive models of fruits and the like; our University collection, as it happens, includes two splendid specimens, a pair of Protocorinthian clay imitations of poppy-capsules, not much after 700 B.C. in date.³ The surprising fact is that the process, being known, was not practised more widely

¹ *Archaeological Reports for 1969–70* 61 f.; *JHS* xc (1970) 199 ff.

² In 'playing' it is not possible to vary the tone of the cup by placing a finger over the open hole.

³ EM 6906, EM 6908 (*ex H. Schliemann*): *CV Norway* (1) pl. 1, 2–3; *Institutum Romanum Norvegiae. Acta ad archaeologiam et artium historiam pertinentia* iv (1969) 7 ff. Similar (fragmentary): *Perachora* i (1940) pl. 25, 1–2; *Monumenti Antichi* xxv (1919) 544 f., fig. 132, top.