

ΛΑΣΑΝΑ, TUYERES, AND KILN FIRING SUPPORTS

(PLATES 47–51)

IN 1985, Yves Grandjean and Sarah P. Morris, working independently, published a class of objects which scholars had previously variously identified as tuyères (bellows' nozzles), cult objects, rhtya for libations, or torch stands.¹ Grandjean, concentrating on material from the French excavations at Thasos, with specific reference to that discovered in the area of the Silen's Gate, discusses various earlier interpretations and stresses that, as a group, these objects are not uniform.² He notes that variations in form and context allow different functions but prefers a "*nouvelle interprétation*", namely that they were used as supports to

¹ For Grandjean and Morris, see the abbreviations below.

I am grateful to T. Leslie Shear, Jr. and John McK. Camp II for permission to study, and illustrate here, a number of *λάσανα*, tuyères, and kiln firing supports from the excavations in the Athenian Agora. Thanks are also due to the staff of the Agora excavations, particularly Jan Diamant and Craig Mauzy, for their generous assistance and good humor in facilitating my work. I am also grateful to Ursula Knigge, Bettina von Freytag gen. Löringhoff, Axel Rügler, and Angelika Schöne for permission to inspect, discuss, and publish the *Brennstützen* illustrated here in Plate 50:a and other related pieces from the Athenian Kerameikos. The two *λάσανα* illustrated in Figure 1, bottom are in the Antikenmuseum, Berlin; the drawings, by Thomas Feuerhake, are the same as those published by Morris (p. 408, figs. 5, 6). Herr Feuerhake also drew the *λάσανα* in Figure 1, top. Figure 2 is by Ann-Louise Schallin; the remainder are by the author and were inked by Ms. Schallin. Photographs are by Craig Mauzy, except for Plate 47:a (courtesy of the DAI – Rome, neg. no. 75.304), Plate 50:a (courtesy of the DAI – Athens, neg. no. KER 13187), and Plate 51:f, which is by Ingrid Gecke-Heiden (courtesy Antikenmuseum Berlin, Staatliche Museen Preussischer Kulturbesitz, inv. F 893).

Works frequently cited are abbreviated as follows:

- Agora V* = H. S. Robinson, *The Athenian Agora, V, Pottery of the Roman Period: Chronology*, Princeton 1959
- AGRP* = *Ancient Greek and Related Pottery. Proceedings of the International Vase Symposium in Amsterdam 12–15 April 1984* (Allard Pierson Series: Studies in Ancient Civilization 5), H. A. G. Brijder, ed., Amsterdam 1984
- Grandjean = Y. Grandjean, "Tuyères ou supports?" *BCH* 109, 1985, pp. 265–279
- Kaloyeropoulou = A. Kaloyeropoulou, "From the Techniques of Pottery," *AAA* 3, 1970, pp. 429–434
- Morris = S. P. Morris, "ΛΑΣΑΝΑ: A Contribution to the Ancient Greek Kitchen," *Hesperia* 54, 1985, pp. 393–409
- Noble = J. V. Noble, *The Techniques of Painted Attic Pottery*, rev. ed., London 1988
- Papadopoulos = J. K. Papadopoulos, "An Early Iron Age Potter's Kiln at Torone," *MeditArch* 2, 1989, pp. 9–44
- Richter = G. M. A. Richter, *The Craft of Athenian Pottery*, New Haven 1923
- TISG* = R. Hampe and A. Winter, *Bei Töpfern und Ziegeln in Süditalien, Sizilien und Griechenland*, Mainz 1965
- TKMZ* = R. Hampe and A. Winter, *Bei Töpfern und Töpferinnen in Kreta, Messenien und Zypern*, Mainz 1962
- Treister and Shelov-Kovedyayev = M. J. Treister and T. V. Shelov-Kovedyayev, "An Inscribed Conical Clay Object from Hermonassa," *Hesperia* 58, 1989, pp. 289–296
- Voigtländer = W. Voigtländer, "Zur archaischen Keramik in Milet," in *Milet 1899–1980. Ergebnisse, Problem und Perspektiven einer Ausgrabung (Kolloquium Frankfurt am Main 1980)*, W. Müller-Wiener, ed., Tübingen 1986, pp. 35–56

For an overview of past scholarship see Grandjean, pp. 271–276; Morris, pp. 394–397; Treister and Shelov-Kovedyayev, pp. 289–290. For true torch stands see, most recently, K. Kilian, "Ein mykenisches Beleuchtungsgerät," in *Φίλια 'Επη εις Γεώργιον Ε. Μυλωνάν* I, Athens 1986, pp. 152–166.

² Grandjean, pp. 266–271.

hold cooking vessels over the fire.³ Morris arrives at the same conclusion by the argument that such objects could not have served as tuyères and, in addition, ably dismisses other earlier interpretations.⁴ She ingeniously reveals their ancient name, *λάσανα*, and presents in support the Ricci hydria from Caere, which depicts, among other scenes of cooking and sacrifice, these objects supporting a cooking vessel over the fire (Pl. 47:a, b, d).⁵

Both Morris and Grandjean consider *λάσανα* essentially an element of the Greek kitchen but concede that related props encountered in industrial contexts may have been used to support molds or crucibles in bronze- and ironworking establishments and perhaps even as supports for vessels and tiles in ceramic kilns.⁶ The argument that such objects served as pottery supports in kilns was somewhat more strongly stated by Walter Voigtländer in a paper presented in 1980 and published in 1986.⁷ Working with material from Miletos, Voigtländer divides what he refers to as "*Blasebälge*" ("bellows' nozzles") into three groups on the basis of shape and suggests that each group served a different function. His first group comprised what he considers to be true tuyères (*Blasebälge*).⁸ The second group, because of small openings on the side, must have served, he argues, some other function; he alludes to their use in the pouring of liquid metals such as lead or bronze, in which case the side openings are interpreted as vent holes for hot air and smoke to escape.⁹ The third group, those with no central opening or those which are solid through (cf. Fig. 1, bottom), may have been used, he states, for the crushing of fine grain substances, or else were used as supports for large vessels in kilns or in *anderen Feuerstellen*.¹⁰ Voigtländer considers the examples of all three groups as industrial, not domestic, implements.

In a recent issue of *Hesperia*, Michael Treister and Theodore Shelov-Kovedyayev published a *λάσανον* unique only in the fact that it bears a fragmentary inscription in Greek; they refer to their piece as a "conical clay object".¹¹ It derives from the Russian excavations at Hermonassa on the Taman Peninsula in the Kimmerian Bosphoros and was found in a pit "containing materials dating to the 6th and 5th centuries B.C." (p. 289). The authors review the literature on "conical clay objects" (which, incidentally, are not really conical)

³ Grandjean, pp. 276–279.

⁴ Morris, pp. 395–397.

⁵ Morris, pp. 398–400, pl. 104:a, b. For earlier discussion of the term *λάσανα* see B. A. Sparkes and L. Talcott, *The Athenian Agora*, XII, *Black and Plain Pottery of the 6th, 5th and 4th Centuries B.C.*, Princeton 1970, p. 233, note 10 and LSJ, s.v. *λάσανα*. Morris (pp. 403–409) provides the fullest list of *λάσανα* from Mediterranean and Black Sea sites.

⁶ Morris, p. 405, notes 32, 33.

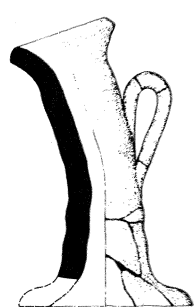
⁷ Voigtländer, pp. 38–41.

⁸ Voigtländer, pp. 38–41, fig. 12, no. 2081. These are similar to the three examples from the Athenian Agora (Fig. 1, Pl. 47:c, d).

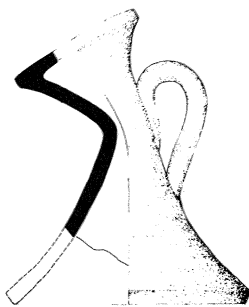
⁹ Voigtländer, p. 40, fig. 13, nos. 2054, 2040. For this second group Voigtländer's suggested usage is difficult to follow, and the relevant passage in the German is worth quoting in full (p. 41): "Dagegen diente die zweite Gruppe (Nr. 2040, 2054) vermutlich anderen Zwecken. Man könnte an ein Ausgießen flüssiger Materialien wie Blei oder Bronze denken, die einer Form zugeführt werden sollten. Die seitlichen Öffnungen sind denn Abzugsöffnungen für die heisse Luft und den Rauch zu deuten." It is very difficult to conceive how liquid metal passing through the funnel would not also pour out of the side openings.

¹⁰ Voigtländer, p. 40, fig. 13, nos. 2005 and 2080. The two examples reproduced here in Figure 1, bottom (= Morris, p. 408, figs. 5, 6) are now in the Antikenmuseum in West Berlin; their provenance is unknown.

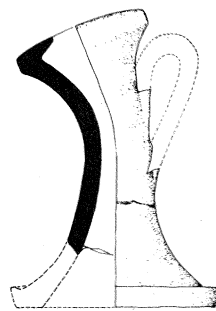
¹¹ Treister and Shelov-Kovedyayev, pp. 289–296.



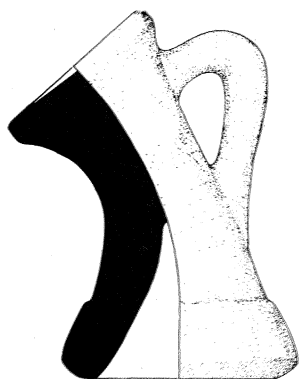
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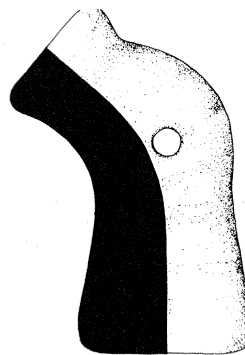
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688x, 1



688x, 2

FIG. 1. *Λάσανα*: top, from the Athenian Agora; bottom, Antikenmuseum, Berlin. Scale 1:4

and state that it is beyond doubt that such objects were used both as bellows' nozzles and as cooking stands (p. 292). They suggest, however, a further function, "one indicated by a significant feature of their archaeological context to which researchers, with the exception of Voigtländer, have paid insufficient attention," namely that such objects were used to support pots during firing in a kiln; they assume that the inscribed example from Hermonassa was such a firing support. Although there is nothing new in this interpretation, their argument is based on the evidence that, at several sites, such objects have been found in excavations of pottery kilns or nearby.

In short, what seemed a reasonable hypothesis by Grandjean and a convincing argument by Morris appears not to have found universal favor. Since some doubt and no small measure of misconception have crept into the literature concerning the function of these objects, a few words on them here would not be out of place. The aim of this paper is to restate briefly the arguments that *λάσανα* make unlikely tuyères and to cast some serious doubt on the interpretation that they served as firing supports for pottery in kilns. To this end, some typical examples of *λάσανα*, tuyères, and kiln firing supports are illustrated, primarily from the excavations in the area of the Athenian Agora where ample evidence of

metalworking and potters' activities, as well as debris from domestic settlements, has come to light.¹²

On the question of λάσανα as tuyères, Morris' arguments are straightforward and compelling.¹³ First of all, the bases of λάσανα (Fig. 1, Pl. 47:b–e) indicate that they were designed to sit on a horizontal surface and could hardly have been attached to a set of bellows. Second, the rims flare out instead of narrowing, as one would expect in a mouthpiece designed to direct a concentrated stream of air. Third, a number of λάσανα, such as those of Voigtländer's third group¹⁴ or those from Berlin illustrated here in Figure 1,¹⁵ have no opening or are solid through and were clearly not used for channeling air. Finally, a brief comparison of λάσανα with true tuyères (e.g., Fig. 2, Pl. 48) shows that the two types of implement have little in common. Of the latter, the five bellows' nozzles from the Athenian Agora presented here derive from later Roman contexts: P 23258 and P 30198 from the "Heliaina" Metalworks (3rd–4th centuries after Christ), B 1598 from the South Square area (late 3rd–5th centuries after Christ), and B 1519 and B 1520 from the Oval Workshop (late 4th century after Christ).¹⁶ All five examples are reused necks of common amphoras of the period. Such bellows' nozzles, on the basis of the evidence from the Agora excavations, appear only in post-Herulian deposits (i.e., after A.D. 267) and represent a complete change from the roughly modeled clay coverings for bellows' nozzles used during earlier periods.¹⁷ An important feature of the nozzles is the substantial vitrification of the narrower, upper end of the amphora neck (the end slotted into the furnace), produced by intense heat (cf. Pl. 48). Sometimes, remains of slag still adhere to the nozzle edge. Foundry sites elsewhere in the Greek world have produced other types of bellows' nozzles such as narrow tapering cones, as well as double-barreled nozzles of heavy fabric.¹⁸ These various types of true

¹² It is stressed that the publication of the material from the Athenian Agora in this paper does not aim at being definitive or comprehensive. The λάσανα, tuyères, and kiln firing supports presented below represent only a selected sample. The five λάσανα illustrated here are published and fully discussed in Morris, pp. 393–409. The five bellows' nozzles are published, discussed, and illustrated by photographs in C. Mattusch, "Bronze- and Ironworking in the Area of the Athenian Agora," *Hesperia* 46, 1977, pp. 340–379. The kiln firing supports are unpublished except for the four following pieces: P 17105, Fig. 7, Pl. 51:d, e, *Agora* V, p. 11, note 8, pl. 39; MC 352 (see note 32 below); MC 579, MC 577, Fig. 6, Pl. 50:b, c, S. I. Rotroff, *The Athenian Agora*, XXII, *Hellenistic Pottery: Athenian and Imported Moldmade Bowls*, Princeton 1982, nos. 414, 415, p. 93, pl. 72.

¹³ Morris, pp. 396–397.

¹⁴ Voigtländer, nos. 2005, 2080, pp. 40–41, fig. 13.

¹⁵ Morris, p. 408, figs. 5, 6.

¹⁶ P 23258, P 30198: Mattusch (note 12 above), K1 and K2, p. 368; H. A. Thompson, "Excavations in the Athenian Agora: 1953," *Hesperia* 23, 1954, p. 33; H. A. Thompson and R. E. Wycherley, *The Athenian Agora*, XIV, *The Agora of Athens: The History, Shape and Uses of an Ancient City Center*, Princeton 1972, p. 190. B 1598: Mattusch, *op. cit.*, L3, p. 369. B 1519, B 1520: *ibid.*, M10 and M11, p. 372.

¹⁷ Mattusch, *op. cit.*, p. 368, note 54; for earlier clay covers see A5, pp. 345, 347, pl. 78; H9, p. 363, pl. 90; J3, p. 367, pl. 91. Compare the material from the Kerameikos, G. Zimmer, "Giessereieinrichtungen im Kerameikos," *AA (JdI)* 99, 1984, pp. 63–83; also that from Kassope, E.-L. Schwandner *et al.*, "Zum Problem der Öfen griechischer Bronzegiesser," *AA (JdI)* 98, 1983, pp. 57–80.

¹⁸ For these see Morris, p. 396, note 12. Note also the material, including bellows' nozzles, recently published from Olympia: W. D. Heilmeyer and G. Zimmer, "Die Bronzegiesserei unter der Werkstatt des Phidias in Olympia," *AA (JdI)* 102, 1987, p. 273, figs. 33, 34, pp. 281–282, fig. 37 on p. 283. For tuyères in the Roman world see especially G. Weisgerber and C. Roden, "Römische Schmiedeszenen und ihre Gebläse," *Der Anschnitt. Zeitschrift für Kunst und Kultur im Bergbau* 37, 1985, pp. 2–21.

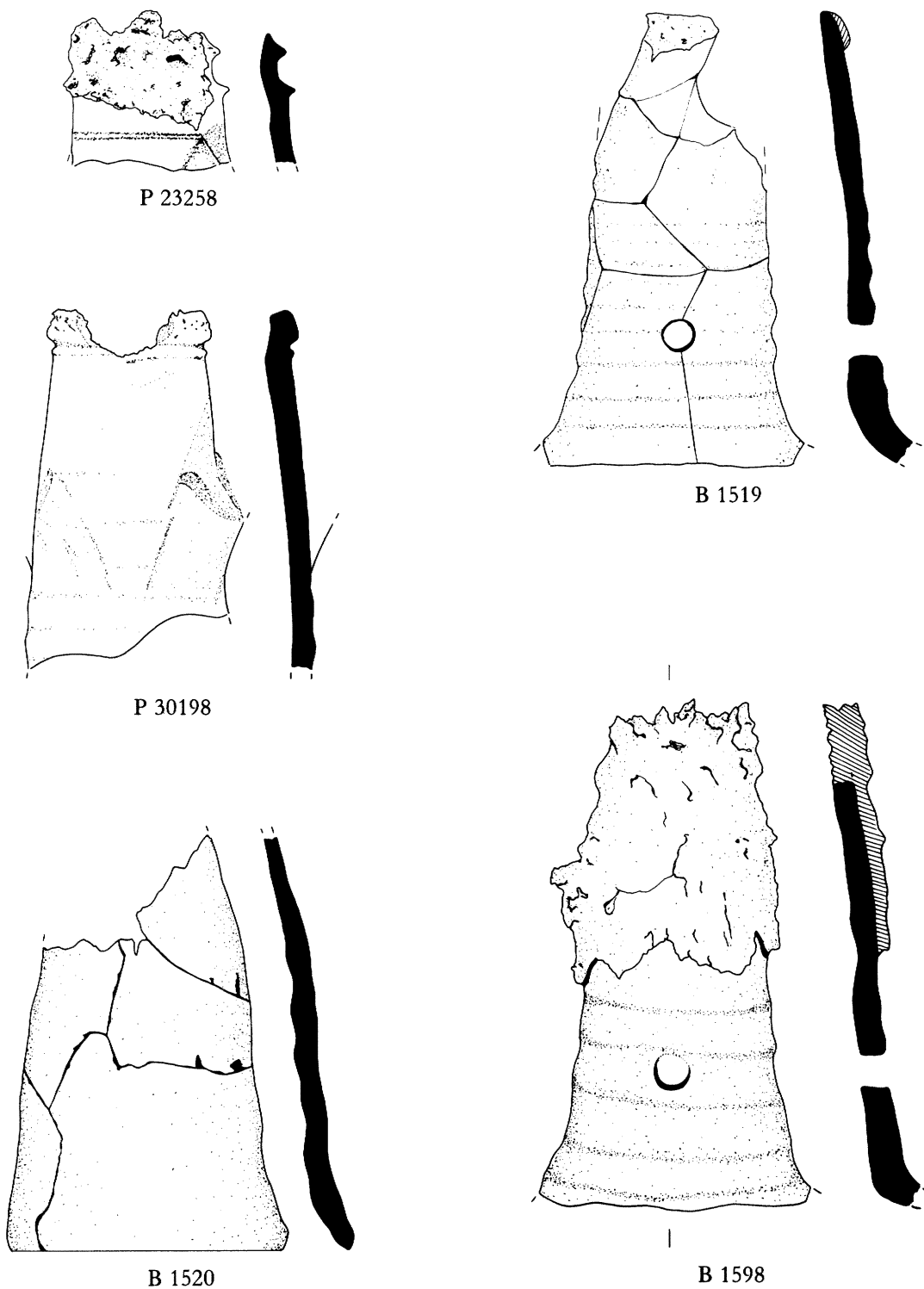


FIG. 2. Tuyères from the Athenian Agora. Scale 1:3

tuyères differ from *λάσανα* in that the latter, although made of coarse fabric and often partially blackened, have well-modeled bases and rims,¹⁹ are invariably equipped with a handle, and rarely, if ever, display the substantial vitrification of true tuyères. These features are a product of function, and a glance at Hodges' simple furnaces with skin, drum, or cylinder bellows shows how difficult it would be to attach *λάσανα* to a forge.²⁰ Moreover, the fact that the *λάσανον* from Hermonassa was boldly inscribed around its rim with what was probably the name of the owner, considered a Cretan in origin, might argue that the implement was more at home in the Greek kitchen than in a kiln or furnace.²¹

The objections for *λάσανα* as tuyères also hold true for *λάσανα* as firing supports for pottery in kilns. True firing supports have been found at numerous ancient kiln sites, and some of the more common varieties are conveniently assembled and discussed by Kaloyeropoulou. These include triangular or three-legged stilts, a number of which are illustrated by Kaloyeropoulou from the excavations in Kekropos Street in Athens.²² An important feature of their shape is the slight projection at the end of each leg. Similar three-legged stilts were used by Chinese potters at least as early as the period of the Three Kingdoms (A.D. 220–265);²³ they are illustrated by Cipriano Piccolpasso in his treatise of 1548 on the Potter's

¹⁹ Note especially the relatively thin walls of the *λάσανον* from Corinth (C-37-412): Morris, p. 403, fig. 1.

²⁰ H. Hodges, *Artifacts: An Introduction to Primitive Technology*, New York/London 1964, p. 67, fig. 18. For Near Eastern bellows see especially C. J. Davey, "Some Ancient Near Eastern Pot Bellows," *Levant* 11, 1979, pp. 101–11. For a very useful ethnographic study of bellows see T. A. Rickard, "The Primitive Smelting of Iron," *AJA* 43, 1939, pp. 85–101; note especially the nozzles illustrated on p. 95, figs. 2–4 and p. 99, figs. 6, 7.

The scene on the black-figured kantharos from the Athenian Akropolis (Akr. 2134b) commonly cited in support for *λάσανα* as tuyères is that published by P. Hartwig ("Une gigantomachie sur un canthare de l'Acropole d'Athènes," *BCH* 20, 1896, pp. 369–370, pl. VII) and further discussed by F. Benoit ("Soufflets de forge antiques," *REA* 50, 1948, pp. 305–307, fig. 1). The nozzle is depicted as a tapering cone and is not bent above its midpoint, as is the case with *λάσανα*. Moreover, there is a problem with the representation of the handle, or what is thought to be a handle. The latter appears to be vertically attached directly to the rim of the nozzle, whereas the handles of *λάσανα* are invariably set vertically further down on the body and are never attached directly to the rim. I am not absolutely convinced whether what is taken to be a handle on Akr. 2134b is indeed a handle or part of the body of the bellows behind. In any case, a vertical handle projecting beyond the rim edge of a bellows' nozzle is an odd feature.

²¹ Treister and Shelov-Kovedyayev (p. 296) argue that the graffito is in Cretan lettering; they visualize the individual who inscribed it as being a Cretan craftsman who found himself in an alien environment, surrounded by East Ionian Greeks. If this particular *λάσανον* was indeed a bellows' nozzle, then why inscribe the very part that would be slotted into the forge and subject to the most intense heat and vitrification? If a kiln firing support, it would be difficult for it to withstand the thermal shock of repeated firing (see p. 220 below).

²² Kaloyeropoulou, p. 430, figs. 3, 4; O. Alexandri, «Αθήναι, 26: Κέκροπος 7–9», *Δελτ* 24, 1969, B' 1 [1970], pp. 50–53. See also, among others, A. Keramopoulos, «Αθηνών ευρήματα», *ΑρχΕφ* 1911, p. 261, fig. 7; Richter, p. 85, fig. 89; F. O. Waagé, "The American Excavations in the Athenian Agora, First Report: The Roman and Byzantine Pottery," *Hesperia* 2, 1933, p. 327, fig. 21:c; F. G. Maier and M.-L. Wartburg, "Ausgrabungen in Alt-Paphos. 12. Vorläufiger Bericht: Grabungskampagne 1981 und 1982," *AA (JdI)* 99, 1984, p. 315, fig. 25; D. Papanikola-Bakirtzi, "Medieval Pottery from Enkomi, Famagusta," in *Recherches sur la céramique Byzantine (Actes du colloque organisé par l'École Française d'Athènes et l'Université de Strasbourg II, BCH, Suppl. 18)*, V. Déroche and J. M. Spieser, edd., Paris 1989, no. 1, p. 237, fig. 2; P. Armstrong, "Some Byzantine and Later Settlements in Eastern Phokis," *BSA* 84, 1989, no. V79, p. 46, pl. 8.

²³ L. Fasheng et al., "Ancient Long Kiln and Kiln Furniture in Zhejiang Province," in *Scientific and Technological Insights in Ancient Chinese Pottery and Porcelain (Proceedings of the International Conference on Ancient Chinese Pottery and Porcelain Held in Shanghai, November 1–5, 1982)*, Beijing 1986, p. 318, fig. 2; two-pinned, rather than three-pinned, setters or stilts are known from the Han Dynasty (206 B.C.–

Art and continue to be used by modern potters.²⁴ These stilts are particularly suited for insertion between glazed open vessels stacked one on top of the other in the kiln, and a useful illustration of how they were employed is published by Papanikola-Bakirtzi, who presents the most detailed study of this type of kiln firing support.²⁵ The impressions left by such stilts are especially noticeable on the floors and undersides of Byzantine and later glazed open vessels. The eight firing supports illustrated here from the Athenian Agora are small and rather crudely formed by hand (Fig. 3, Pl. 49:a).²⁶ Of those which derive from informative contexts, all are of Byzantine or post-Byzantine date,²⁷ and most bear traces of green or yellow-brown glaze on the projections where they came into contact with the interior of a glazed open vessel during the firing process.²⁸ They measure, from vertex to vertex of the sides, between 6 and 8 cm.; the thickness of the legs is between 0.8 and 2 cm. at the center, and between 1.8 and 3 cm. at the projections.²⁹ A possible, though far from certain, earlier variant is P 17515 illustrated here in Figure 4 and Plate 51:a. Equipped with four projections (three of which are preserved) and a central hole, it is slightly larger than its three-legged counterparts. The piece was found in the fill of a well, in association with Hellenistic terracottas and pottery; context thus provides no firm clue as to its function.³⁰

The second common type of kiln firing support published by Kaloyeropoulou is the small, semielliptical, leaf-, drop-, or pear-shaped clay "plaque", with the straight side

A.D. 220). See further the paper by S. Jisheng, "A Preliminary Study on Kiln Furniture and Setting Methods in Ancient Shanxi," in the same volume (pp. 306–313).

²⁴ Cipriano Piccolpasso, *The Three Books of the Potter's Art*, B. Rackham and A. van de Put, edd. (The Victoria and Albert Museum), London 1934; cf. N. F. Barka *et al.*, *The "Poor Potter" of Yorktown: A Study of a Colonial Pottery Factory*, III, *Ceramics*, Yorktown 1984, fig. 265. For usage by modern potters see Kaloyeropoulou, p. 430, fig. 5, p. 432, note 9. See also G. J. Cox, *Pottery, for Artists, Craftsmen and Teachers*, New York/London, repr. 1938, p. 114, fig. 54, where four varieties of three-legged stilts are depicted. For a related support known as a "spur" or "cock-spur" see E. Bourry, *A Treatise on Ceramic Industries: A Complete Manual for Pottery, Tile, and Brick Manufacturers* (A. B. Searle trans.), London 1911, p. 398, fig. 280.

²⁵ D. Papanikola-Bakirtzi, «Τριπόδισκοι ψησίματος των Βυζαντινών και μεταβυζαντινών αγγείων», in ΑΜΗΤΟΣ. Τιμητικός τόμος γιά τον καθηγητή Μανόλη Ανδρόνικο II, Thessaloniki 1987, p. 642, fig. 1, pls. 127–130; *eadem*, *Medieval Cypriot Pottery in the Pierides Foundation Museum*, Larnaka 1989/1990, p. 41, fig. 2 and p. 36, fig. 1 for the tripod stilts themselves.

²⁶ Elsewhere, mold- and wheelmade stilts are also known, see Papanikola-Bakirtzi, 1987 (note 25 above), p. 645, fig. 2 (mold), pl. 128 (handmade stilts), pl. 129 (moldmade, wheelmade, handmade stilts). Most of the Agora stilts preserve slight slits towards each projection, suggesting that the ends were folded back by hand.

²⁷ The eight three-legged stilts presented here derive from various late contexts and represent only a small selection of such stilts from the Agora excavations. Numerous similar stilts were encountered in two late kilns uncovered below the Church of the Vlassarou, while many more were found in a pit nearby; see A. Frantz, "Turkish Pottery from the Agora," *Hesperia* 11, 1942, p. 2.

²⁸ In Figure 3 the glaze is rendered by solid ink. Hatched areas are those parts of the stilt projections which came into contact with the next pot in the kiln and were subsequently snapped off leaving no trace of the glaze.

²⁹ Similar dimensions are recorded for those stilts published by Kaloyeropoulou, pp. 431–432.

³⁰ The identification of P 17515 as a kiln firing support is only tentative. There is a note in pencil, by G. R. Edwards, on the inventory card in the Agora Archives, which states: "For firing terracotta figurines?" The filling of the well, deposit B 20:7, and its chronology are discussed by D. B. Thompson, "Three Centuries of Hellenistic Terracottas II B. The Altar Well," *Hesperia* 28, 1959, pp. 127–128; see now H. A. and D. B. Thompson and S. I. Rotroff, *Hellenistic Pottery and Terracottas*, Princeton 1987, where the article is reprinted, with updated information on the chronology, p. 185. The piece was found in the upper filling of the well, which is assigned to the third quarter of the 3rd century B.C. but which included material of considerably earlier date.

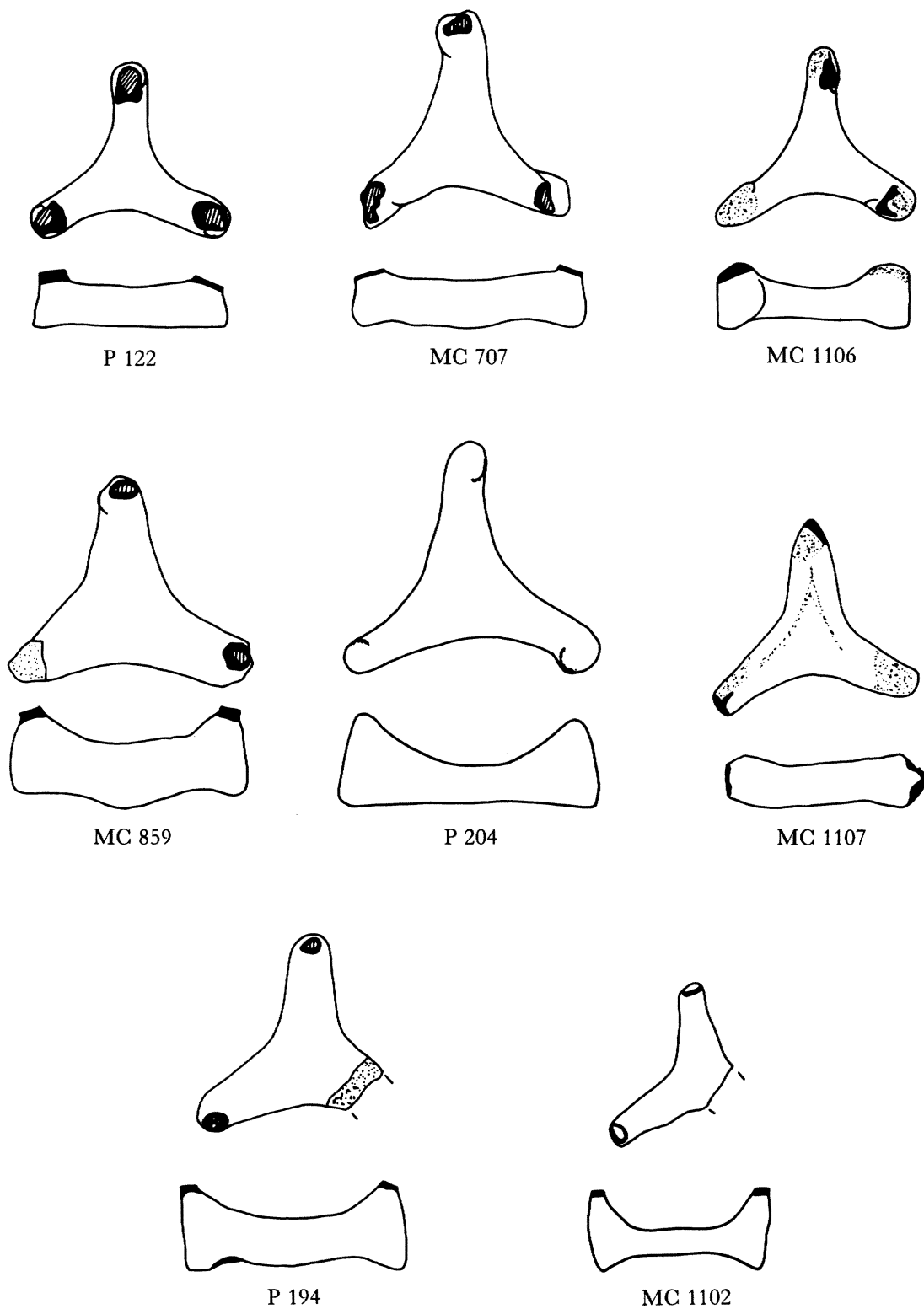


FIG. 3. Kiln firing supports (tripod stilts) from the Athenian Agora. Scale 1:2

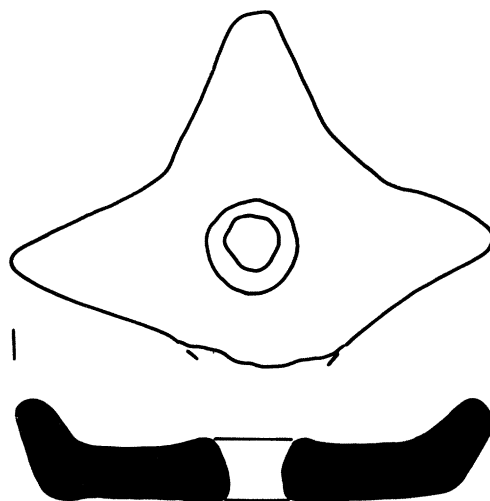


FIG. 4. Athenian Agora P 17515: kiln firing support (?). Scale 1:2

slightly raised to form a lip.³¹ Of the examples presented by her, those from Corinth date to the 4th century B.C. and to the 2nd century after Christ, those from Epitalion range in date from the 1st century B.C. to the 3rd century after Christ, while examples from Athens are particularly numerous in the Roman and Byzantine periods, although they also occur in earlier contexts.³² The eleven pieces from the Athenian Agora assembled in Figures 5, 6, and Plate 49:b, c are mostly of Roman or Early Byzantine date. The smallest has a maximum length of 5.7 cm., the largest 7.7 cm.; they average about 7 cm. The maximum thickness, at the lip, is between 1.8 and 4.5 cm., and most commonly between 2.5 and 3 cm.³³ Similar to these, but smaller and with projecting lips on both sides, is Agora MC 947 (Fig. 6, Pl. 51:b, c), found in a deposit of the 4th century B.C. or slightly later;³⁴ it tapers more noticeably

³¹ Kaloyeropoulou, p. 431, fig. 6; p. 432, figs. 7, 8; p. 433, fig. 9.

³² Corinth: Kaloyeropoulou, p. 433, fig. 9; cf. C. Roebuck, *Corinth*, XIV, *The Asklepieion and Lerna*, Princeton 1951, no. 16, p. 121, pl. 32.

Epitalion: Kaloyeropoulou, p. 431, fig. 6.

Athens: e.g., *Agora V*, M 340, p. 116, pl. 50 (MC 352; Fig. 5, Pl. 49:b, c). A number of similar examples have been found recently among the debris associated with ten Roman and Late Roman kilns in the Athenian Kerameikos; for a preliminary report of these excavations see U. Knigge and A. Rügler, "Die Ausgrabungen im Kerameikos 1986/87," *AA (JdI 104)* 1989, pp. 84–89.

³³ Of the examples illustrated here from the Agora, some were encountered either in or nearby a kiln of the 9th–10th centuries after Christ; see R. S. Young, "An Industrial District of Ancient Athens," *Hesperia* 20, 1951, p. 286. These include MC 702, MC 703, and MC 704 (cf. MC 710); 38 similar supports were found at the same time in the six channels at the east end of the kiln and another 10 were found later in the fourth channel on the north side. The remaining supports illustrated here derive from less informative Late Roman or Byzantine levels, with the exception of MC 1194 which was found in a layer of the 1st century B.C. or later, from the peristyle south of Roman House ε, and is perhaps considerably earlier. MC 700, which was unstratified, is of a fabric and slip much different to that of the remainder of pieces illustrated here and is conceivably of earlier date. The pieces illustrated by Kaloyeropoulou (note 32 above) normally measure 5–6 × 8–9 cm. and rarely exceed a length of 10 cm. Somewhat larger but very similar supports are illustrated from modern Sicily in *TISG*, pl. 38:5.

³⁴ From the South Shop Building.

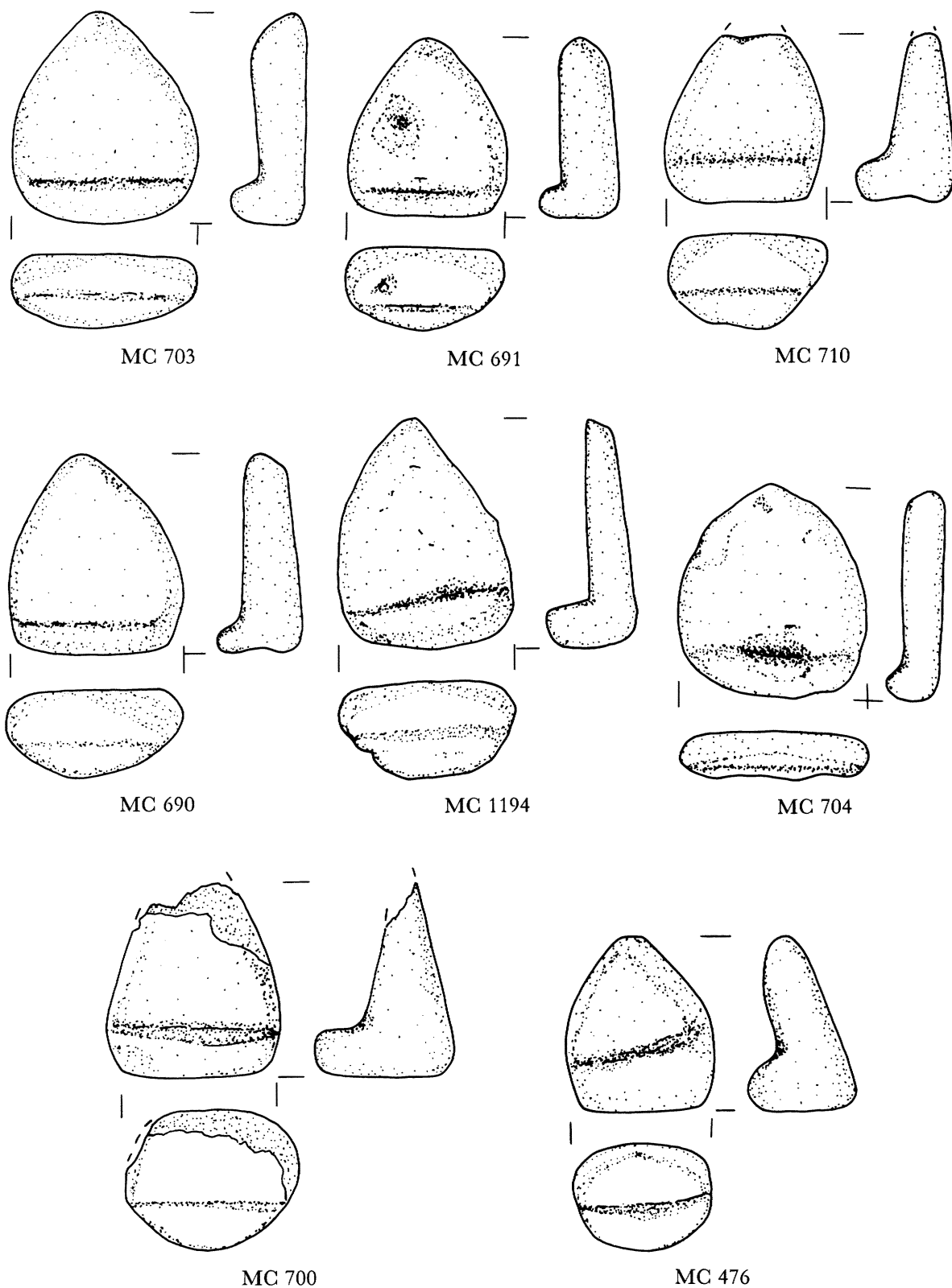


FIG. 5. Kiln firing supports from the Athenian Agora. Scale 1:2

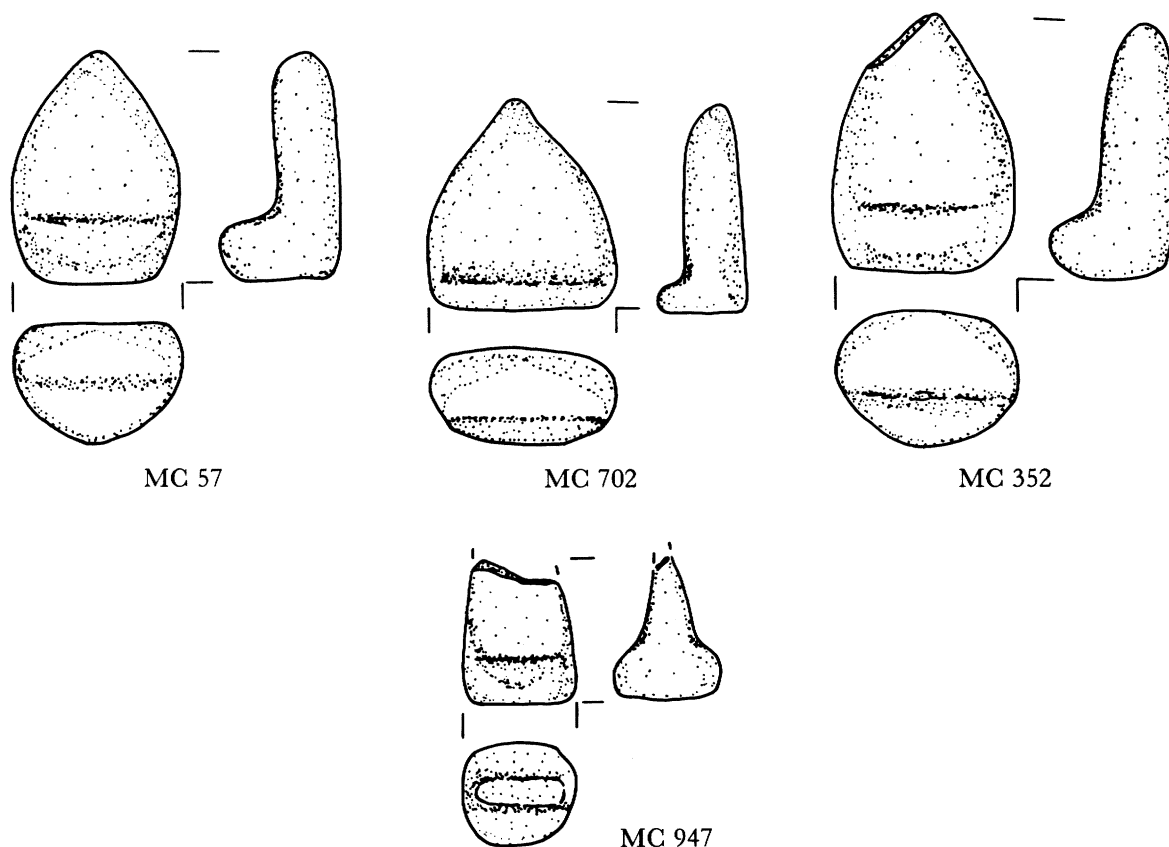


FIG. 6. Kiln firing supports from the Athenian Agora. Scale 1:2

towards the top and is best described as a clay wedge. As with *λάσανα*, these small clay “plaques” have been variously identified as “objects of religious significance”, “a representation of a tongue”, and even as “theatre tickets”.³⁵ Like their three-legged counterparts, they are small and roughly finished. They could be placed between pots of various shapes and sizes in the kiln, with the small lip perhaps preventing pots from slipping once stacked. One possible method of use is presented by Kaloyeropoulou; the same method is used by modern Cretan potters, who normally use sherds of broken pots for the purpose.³⁶

A closely related form of firing support is that illustrated here in Plate 50:a; the five pieces, from the Athenian Kerameikos, derive from the fill of a double cistern and were found in association with pottery of the 3rd century after Christ.³⁷ These T-shaped *Brennstützen*

³⁵ Religious objects: K. Lehmann-Hartleben, “Preliminary Report on the Second Campaign of Excavations in Samothrace,” *AJA* 44, 1940, p. 353, fig. 36, p. 355.

Tongue: Roebuck (note 32 above), p. 121.

Tickets: S. I. Dakaris, «Ανασκαφή του ιερού της Δωδώνης», *Πρακτικά* 1966, p. 79, pl. 80 (top); for the discovery of a kiln in the Sanctuary, considered to be of Geometric date, see *idem*, «Ανασκαφή του ιερού της Δωδώνης», *Πρακτικά* 1967, p. 41, fig. 5 (cf. G. Daux, “Chronique des fouilles et découvertes archéologiques en Grèce en 1967,” *BCH* 92, 1968, pp. 849–53, fig. 5).

³⁶ Kaloyeropoulou, p. 433, fig. 10. For modern use see *TKMZ*, pls. 10:6, 11:2.

³⁷ U. Knigge and B. von Freytag gen. Löringhoff, “Ausgrabungen im Kerameikos 1983–1985,” *AA* 1987, pp. 492–493, fig. 19.

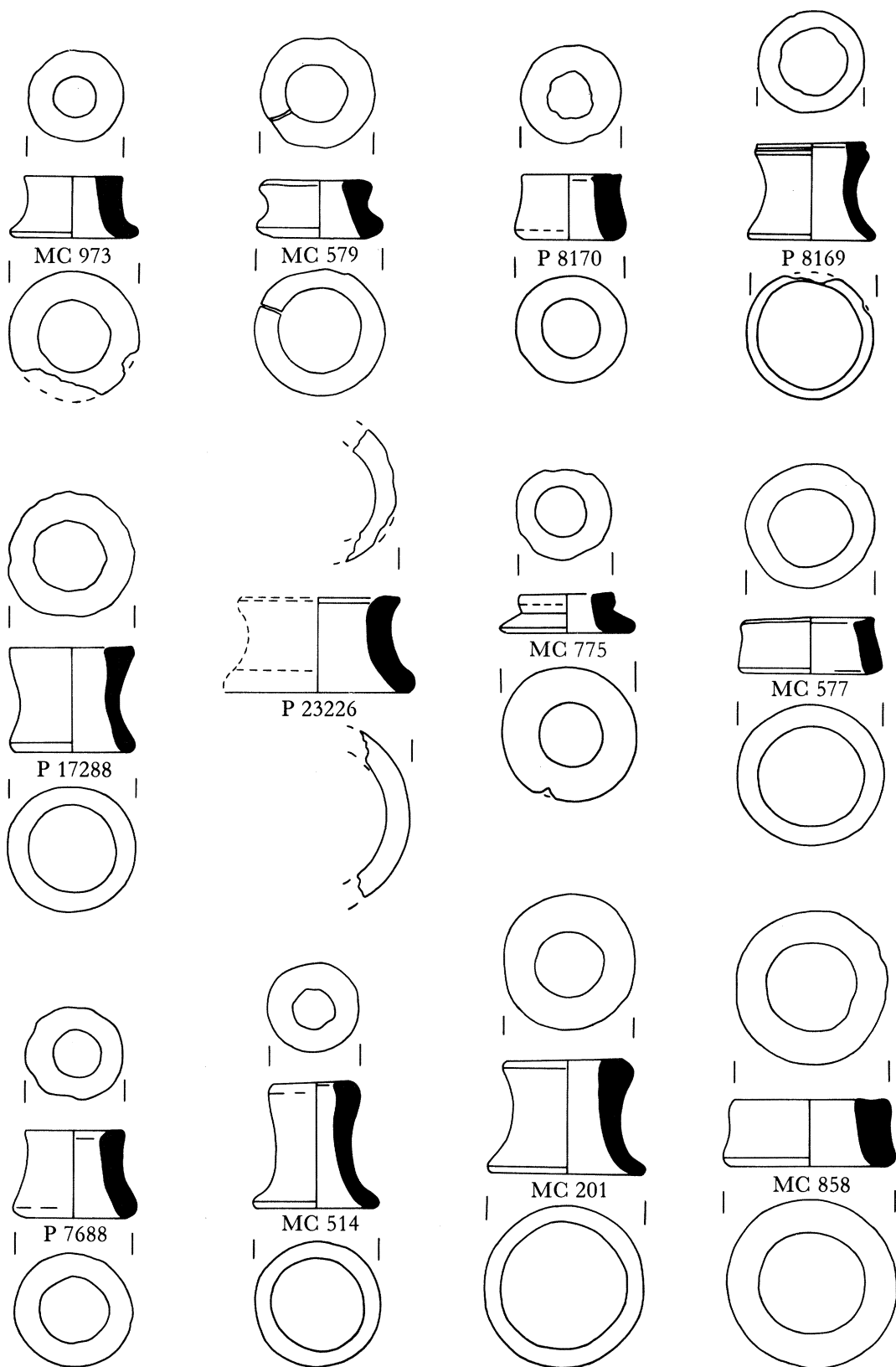


FIG. 7. Kiln firing supports (stacking rings) from the Athenian Agora. Scale 1:2

measure between 8.5 and 10 cm. in length and between 4.3 and 5.7 cm. along the shorter leg or crossbar.³⁸ At least eighteen similar, but fragmentary, supports were recently found at the Kerameikos in a deposit dated to the late 4th to early 3rd century B.C.³⁹ In terms of shape they are a larger and more rectangular version of the type represented by Agora MC 947 and in principle not unlike those assembled in Figures 5, 6, and Plate 49:b, c. They were conceivably used in a manner similar to that suggested for the latter, the T-shape being advantageous for preventing surfaces of stacked pots from touching both vertically and horizontally.⁴⁰

Other types of clay firing supports are known, and those recently published from the Archaic kilns at Phari on Thasos are worth citing.⁴¹ Two types of pottery firing supports (πήλινα στηρίγματα) are illustrated from that site: small crude clay rings and simple, roughly rectangular, pieces of clay.⁴² Better formed, wheelmade clay rings with concave profiles, small in size and sometimes pierced with one or more holes, are known from the Classical kilns at Sindos in Macedonia; they are similar in shape and size to the well-known black-glazed concave saltcellar but lack a floor or underside.⁴³ Similar stacking rings of Classical and Hellenistic date, but without the pierced holes, are known from the Athenian Agora (Fig. 7, Pl. 50:b, c).⁴⁴

Yet another type of support is the small circular clay disk or pad (Fig. 8, Pl. 51:d, e) found fused onto the base fragment of a black-glazed open vessel from the Agora.⁴⁵ The pad, as preserved, has a maximum diameter of 1.7 cm. and a thickness of 0.5 cm. Similar firing disks, adhering to kiln wasters, are known from the Çandarlı kilns excavated by

³⁸ The shorter leg is usually rectangular but is sometimes square. The longer leg is most commonly between 9 and 10 cm.

³⁹ I am grateful to Dr. Angelika Schöne for showing me these pieces and providing details of their context. Of the better preserved examples, the shorter legs are of dimensions similar to those pieces of the 3rd century after Christ (5.8 × 4.6 cm., 4.4 × 4.0 cm., 4.3 × 3.4 cm.).

⁴⁰ See note 36 above.

⁴¹ C. Peristeri *et al.*, «Θάσος 1985: Πρώτη ανασκαφική έρευνα σ'ένα εργαστήρι αγγειοπλαστικής στη θέση «Φάρν» Σκάλας Μαριών», *ΑΑΑ* 18, 1985, p. 32, figs. 3 and 4.

⁴² *Ibid.*, p. 32, figs. 3 and 4 respectively. Compare the clay loops from Corinth thought to be possible props for firing pottery in the kiln or else votive offerings: G. R. Davidson, *Corinth*, XII, *The Minor Objects*, Princeton 1952, no. 2920, pp. 335 and 339, pl. 139.

⁴³ Rings: A. Despoine, «Κεραμεικοί κλίβανι Σίνδου», *ΑρχΕφ* 1982, p. 66, fig. 5, pls. 2:στ, 8:α, β. Saltcellar: Sparkes and Talcott (note 5 above), nos. 921–938, pp. 136–137, fig. 9, pl. 34.

⁴⁴ Not all of these derive from informative contexts, and some may have been used for other purposes. They are presented here primarily as comparanda to those from Sindos found in kiln debris. Of those found in well-dated deposits, all are of late Classical or Hellenistic date and include the following: MC 201 (Deposit D15:3, ca. 370–330 B.C.; see P. E. Corbett, "Attic Pottery of the Later Fifth Century from the Athenian Agora," *Hesperia* 18, 1949 [pp. 298–351], pp. 343–344, discussion under no. 149, p. 343. From a cistern southeast of the Kolonos Agoraios, containing pottery of the second to third quarter of the 4th century B.C.); MC 858 (Deposit H–J:12–14, Middle Stoa building fill, Hellenistic); MC 973 (Deposit P–R:6–12, construction fill of Stoa of Attalos, to ca. 150 B.C. but containing earlier material); P 8169, P 8170 (Deposit B12:5; *idem*, "Palmette Stamps from an Attic Black-Glaze Workshop," *Hesperia* 24, 1955 [pp. 172–186], under no. 7, pp. 179–180. Fill of well yielding some pottery dating to the end of the 4th century B.C. but mostly pottery dating to the "30 years before 350 B.C."); P 7688, P 17288, and P 23226 are all from 4th-century B.C. contexts. For the use of clay rings in the modern traditional kilns of Agira see *TISG*, p. 118, fig. 113, and for other types of supports, pl. 38:3–6.

⁴⁵ *Agora V*, p. 11, note 8, pl. 39.

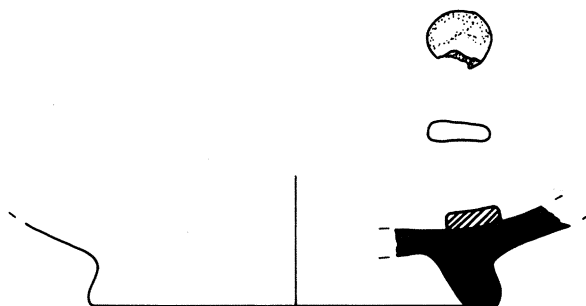


FIG. 8. Athenian Agora P 17105: kiln firing support (stacking disk or pad). Scale 1:2

Loeschcke⁴⁶ and were commonly used for the firing of Pergamene and Arretine wares.⁴⁷ The disks were set between stacked open vessels not only to prevent the adherence of one vessel to another during the firing process but also to permit the better circulation of heat within the kiln.

Despite the fact that true firing supports for pottery in kilns are of various types, they share, as a group, a number of common aspects which are essential to their function. They are all small, crudely and quickly formed, and expendable. True firing supports are not primarily designed to *hold* a pot in place in the kiln, as has been proposed for *λάσανα*, but rather to facilitate stacking by being inserted or wedged between pots. This arrangement would allow better circulation of the hot gasses passing through the firing chamber and ensure that large surfaces of pots placed next to each other in the kiln, whether vertically or horizontally, did not touch and thereby create undesirable variances in the fired result. It is important to note here that the common Greek clay-glaze (such as, for example, Attic and Corinthian black glaze), as Joseph Veach Noble has pointed out, did not melt in the firing process, and therefore it was possible to stack one piece on top of another without the vases sticking together.⁴⁸ Nevertheless, the use of supports in some firings in the Archaic and Classical periods was deemed necessary, as is indicated by the supports from the Phari and Sindos kilns mentioned above. The use of firing supports may well have been essential in the case of pottery bearing complicated decoration (as, for example, black- and red-figured pottery) in order to prevent surfaces of large vessels touching, and when the firing process required a well-controlled and regulated sequence of oxidization, reduction, and reoxidization, to prevent variances of temperature in the kiln that would create blemishes and unwanted effects.⁴⁹

⁴⁶ A waster is any vessel which has been damaged during the kiln firing to the extent that it cannot be used and is, therefore, discarded. For Çandarlı see S. Loeschcke, "Die Arbeiten zu Pergamon 1910–1911, V. Sigillata-Töpfereien in Tschandarlı," *AM* 37, 1912, nos. 2, 4–6, 8, p. 353, fig. 4. The impressions of such disks on a waster from Çandarlı (no. 6, p. 353, fig. 4) show that a total of three disks were placed as setters.

⁴⁷ *Agora V*, p. 11, note 8. See also Waagé (note 22 above), nos. 54–61, p. 286; *Antioch-on-the-Orontes*, I, *The Excavations of 1932*, G. W. Elderkin, ed., Princeton 1934, p. 70, note 17; *Antioch-on-the-Orontes*, IV, i, *Ceramics and Islamic Coins*, F. O. Waagé, ed., Princeton 1948, p. 25. For more recent examples of pads see Barka *et al.* (note 24 above), fig. 266, top right.

⁴⁸ Noble, p. 155.

⁴⁹ Noble, pp. 79–98, 155–156.

It is also important to understand the method of stacking pottery in a Greek kiln. The evidence of the procedures of modern traditional potters, especially in the Mediterranean, are useful for this purpose, as Gisela Richter pointed out.⁵⁰ These procedures are admirably brought together by Roland Hampe and Adam Winter.⁵¹ A more global coverage is offered by, among others, Daniel Rhodes and Bernard Leach; to these standard works one can add the discussions of the technical aspects of pottery production by Noble, Ninina Cuomo di Caprio, and also Robert Cook's lucid account of Watson's Calke Wood kiln.⁵² Whatever the type of kiln (open bonfire with wood fuel over the top, bonfire with cakes of dung fuel acting as a temporary dome, simple updraft kilns, simple downdraft kilns, more complex downdraft kilns with multiple chambers like those of the Far East crossdraft kilns, or even muffle kilns⁵³), the method of stacking pottery is similar. Open vessels may be stacked in piles one on top of the other;⁵⁴ large closed vessels of similar shape and size may be closely stacked either upright or upside-down next to each other in single or multiple levels, one on top of the other.⁵⁵ The most common method of stacking when pots of various shapes and sizes are fired together in one kiln is to arrange the pottery in such a way as to create a "sort of hemisphere."⁵⁶ In each case, the intention is to stack as many vessels as possible in one load since any firing requires a process which is time-consuming, difficult and, depending on the availability of fuel, expensive. To judge by the poem *Kiln* (Κάμινος), preserved in the pseudo-Herodotean *Life of Homer*, kiln mishaps were not uncommon in antiquity.⁵⁷ The

⁵⁰ Richter, pp. xi–xiii.

⁵¹ *TKMZ*, *passim*; *TISG*, *passim*. For a useful summary (with addenda) in English see R. E. Jones, *Greek and Cypriot Pottery: A Review of Scientific Studies* (BSA Fitch Laboratory Occasional Paper 1), Athens 1986, pp. 849–880.

⁵² D. Rhodes, *Kilns: Design, Construction and Operation*, London 1968, *passim*; B. Leach, *A Potter's Book*, 3rd ed., London 1976, *passim*; Noble, *passim*; N. Cuomo di Caprio, "Kilns on Pinakes from Corinth," in *AGRP*, pp. 72–82; *eadem*, *La ceramica in archeologia: Antiche tecniche di l'avarazione e moderni metodi d'indagine*, Rome 1985, *passim*; R. M. Cook, "The Calke Wood Kiln," in *AGRP*, pp. 63–66.

⁵³ The use of dung fuel in ancient Greek kilns is plausibly suggested by the scene depicted on the reverse side of the pinax in Plate 51:f, for which see R. M. Cook, "The 'Double Stoking Tunnel' of Greek Kilns," *BSA* 56, 1961, pl. 7:a; *TISG*, p. 230, figs. 146, 147. The scene shows a man standing directly behind a massive boar; with his left hand he appears to hold his nose, while his right hand is outstretched as if ready to collect any falling dung.

On the various types of kilns see *TKMZ*, *passim*; *TISG*, *passim*; Rhodes, *op. cit.*, *passim*; Hodges (note 20 above), p. 37, fig. 3.

⁵⁴ Jisheng (note 23 above), p. 306, figs. 1, 2, p. 308, fig. 5; Bourry (note 24 above), pp. 397–399, figs. 276–281; Noble, p. 155. For ancient Greek illustrations of stacked vases see especially Richter, p. 75, fig. 71 (= H. Blümner, "Scenen des Handwerkes," *AM* 14, 1889, p. 151).

⁵⁵ *TKMZ*, p. 24, figs. 20, 21, pls. 10:6, 11:2; *TISG*, p. 153, fig. 133, pl. 25:1–4; V. Hankey, "Pottery-Making at Beit Shebab, Lebanon," *PEQ* 1968, p. 31, fig. 1, pl. XIV:B.

⁵⁶ Cook in *AGRP* (note 52 above), p. 64, figs. 2, 3. See also Cuomo di Caprio in *AGRP* (note 52 above), p. 75; *TKMZ*, pl. 44; *TISG*, p. 35, fig. 25, pls. 11:1, 13:2–5, 31:3, 4, and 51; Rhodes (note 52 above), pp. 6–8, figs. 4–7, p. 10, fig. 9, p. 16, fig. 18; B. Saraswati and N. K. Behura, *Pottery Techniques in Peasant India* (Anthropological Survey of India, Memoir No. 13:1964), Calcutta 1966, p. 104, fig. 4:1, plate facing p. 108, p. 109, fig. 4:7–9, p. 110, fig. 4:10, p. 124, fig. 4:25, 26.

⁵⁷ The poem is translated in Noble, pp. 186–196 (Appendix III, translation and notes by M. J. Milne) and also by Richter, pp. 94–95. See further, U. von Wilamowitz-Moellendorff, *Vitae Homeri et Hesiodi in usum scholarum*, Berlin 1929 (reprint), pp. 17–18; R. M. Cook, "Notes on the Homeric Epigram to the Potters," *CR* 62, 1948, pp. 55–57; *idem*, "The Homeric Epigram to the Potters," *CR* 65, n.s. 1, 1951, p. 9.

uncertainties inherent in any kiln firing appear to be further corroborated by the representation on a pinax from Corinth of an ithyphallic satyr standing on the *praefurnium* of a kiln, "placed there to ward off the evils that may befall the pottery during firing," as well as by the satyr head on a kiln on a black-figured hydria in Munich.⁵⁸

Among the many known ancient Greek kilns, few are adequately published and even fewer preserve evidence of their firing loads.⁵⁹ Nevertheless, there is sufficient information to suggest that methods of stacking pottery in antiquity were similar to those of traditional modern potters. First, for the stacking of open vessels one on top of the other there is ample evidence in the form of fused rims of wasters, as well as some representations in vase painting.⁶⁰ Second, among the more informative excavated kilns, that uncovered in the area of the "New Cemetery" in Rhodes (a large circular kiln measuring 7 meters in diameter) yielded *in situ* part of its firing load of numerous amphoras stacked upside-down next to each other.⁶¹ Of the four excavated Classical kilns at Sindos, the large rectangular Kiln 4 (measuring 4.25×1.85 m.) produced evidence that terracotta figurines and loomweights, as well as domestic pottery of the 4th century B.C., were fired together.⁶² The small Late Geometric potter's kiln at Torone in Chalkidike yielded fragments of at least fourteen vessels which had collapsed into the firing chamber during the process of firing, among them three large handmade pithoi, a smaller wheelmade pithos or jar, seven wheelmade and painted amphoras (the majority being large), a large wheelmade krater, a smaller lekanis, a chytra, and perhaps also two loomweights.⁶³ The kiln had a circular shaft only about 0.80 m. in diameter and is of interest since both wheelmade and handmade pottery were fired together. The majority of pots recovered from the collapse were large closed vessels of various shapes, which could only have been accommodated together in the kiln if stacked to form something of a hemisphere. Both large and small ancient Greek kilns are therefore stacked in ways identical to those of modern traditional kilns. In such stacking there is no place for *λάσανα* as supports.⁶⁴ Noteworthy also is the evidence of the well-known black-figured pinax from

⁵⁸ Pinax: Cuomo di Caprio in *AGRP* (note 52 above), p. 79 and pinax no. 10, p. 82.

Hydria: Richter, p. 64, fig. 58; Noble, p. 12, fig. 1, p. 150, fig. 230.

⁵⁹ A useful list of kilns was published by Cook (note 53 above), pp. 64–67. To this additions were made by J. Ziomecki ("Die keramischen Techniken im antiken Griechenland," *Raggi, Zeitschrift für Kunstgeschichte und Archäologie* 1–2, 1964, esp. pp. 25–31) and by K. Davaras ("A Minoan Pottery Kiln at Palaikastro," *BSA* 75, 1980 [pp. 115–126], pp. 118–120, notes 6–20), who earlier provided a list of Cretan kilns of all periods, as well as those of Late Helladic date on the Mainland («Μινωική κεραμική κάμινος εις Στύλων Χανίων», *ΑρχΕφ* 1973, pp. 75–80). See also the list compiled by Despoine ([note 43 above] pp. 80–81, notes 1–10) and to it add that compiled by J. K. Papadopoulos (Papadopoulos, pp. 43–44).

⁶⁰ Fused wasters: e.g., those from Phokaia, E. Langlotz, "Beobachtungen in Phokaia," *AA (JdI)* 84) 1969, p. 381, figs. 4, 5. Representations in vase paintings: Blümner (note 54 above), p. 151; see also the Caputi Hydria by the Leningrad Painter, Noble, p. 13, fig. 2. Concerning the latter, J. R. Green's suggestion ("The Caputi Hydria," *JHS* 81, 1961, pp. 73–75) that the scene represents metalworkers, not potters or painters, was convincingly dismissed by Noble (p. 205, chap. 3, note 11).

⁶¹ E. Zervoudake, «Δωδεκάνησα: Νέο νεκροταφείο», *Δελτ* 33, 1978, B' 2 [1985], pp. 400–401, pls. 208:γ–δ, 209:α–γ. This kiln was only one of four uncovered in the area.

⁶² Despoine (note 43 above), pp. 74–80, pl. 12:α–δ.

⁶³ Papadopoulos, pp. 9–44, esp. pp. 23–42, ill. 12–43.

⁶⁴ Note the case of the modern Cypriot kiln illustrated in *TKMZ*, pl. 39, where huge round-bottomed pithoi were supported by means of numerous tiles set vertically around the base. Even here, however, the

Penteskouphia near Corinth that depicts the stacked interior of a 6th-century B.C. kiln (Pl. 51:f).⁶⁵ A central amphora is surrounded by ten oinochoai, all of which appear to be of medium or large dimensions. Below the supported floor of the kiln, to the right, is what appears to be an open vessel set on its side.⁶⁶ Although a too literal translation of the scene should not be assumed, the pots are stacked in such a way that they form something of a hemisphere. The representation is all the more pointed since it was painted by a potter, and other details of the interior of the kiln, such as the firing floor upheld by a central pier, the carefully rendered floor perforations, along with the opening at the top of the kiln dome, are all very specific.⁶⁷ Here, too, there is no place for *λάσανα*.

An important detail of ancient Greek kilns is size. Although large kilns are known, both circular and rectangular such as those from Rhodes and Sindos already mentioned, the most common are the small circular updraft kilns with a temporary dome of clay and conceivably also of turf, straw, and wasters from previous firings.⁶⁸ The Torone kiln, cited above (p. 218), is one of the smallest known; most ancient Greek kilns of the circular type have a firing shaft with a diameter or length between 1.20 and 2.00 m. and seldom exceed 2.50 m.⁶⁹ Bearing this in mind, a pot supported by three *λάσανα* as reconstructed by Grandjean, and two as illustrated by Morris,⁷⁰ would take up much of the interior space, both in terms of width and height, of any common Greek kiln, and would render it virtually impossible to load much more than one large pot in any single firing. Furthermore, it is difficult to perceive how *λάσανα* may have been used as supports for very small vessels such as Corinthian aryballoi or alabastra or for vessels such as Attic kylikes, to mention only a few shapes.

Two further aspects concerning *λάσανα* are worth noting. First, their general form is not unlike that of another element of kiln furniture not previously discussed, the kiln “prop” or “pillar”. The latter are well known in Oriental kilns, particularly for the firing of stacks of open vessels, and are also used by some modern potters, especially in association with

props themselves are simple roof tiles, ready at hand and expendable, not well-formed supports such as *λάσανα*. Compare further the bricks used to support the massive Cretan pithos (both during production and firing) in A. Winter, “Aufwülsten und Bremen eines Riesenpithos,” *AA (JdI)* 87 (1972), pp. 541–552.

⁶⁵ Antikensmuseum Berlin (Staatliche Museen Preussischer Kulturbesitz), inv. F 893. The pinax is illustrated and discussed by, among others, Richter, p. 78, fig. 80; Cook (note 53 above), pp. 64–67, pl. 7:a, b; H. Malwitz, “Zur griechischen Vasentechnik,” *ÖJh* 45, 1960, p. 230, fig. 98; Ziomecki (note 59 above), p. 31, fig. 19; Noble, p. 152, figs. 237, 238; *TISG*, pp. 230–231, figs. 146–149; Cuomo di Caprio in *AGRP* (note 52 above), pinax no. 18, p. 80.

⁶⁶ Conceivably a krater, the vessel seems to be broken.

⁶⁷ To the upper left, between two oinochoai, and again towards the lower center, are two spots of paint. These are perhaps best seen as accidental, but I wonder whether they may not represent an attempt to render firing supports such as those discussed above?

⁶⁸ Cuomo di Caprio in *AGRP* (note 52 above), p. 75; Jones (note 51 above), p. 873. Davaras ([note 59 above] pp. 123–124) notes that most kiln domes were usually not permanent structures but remade for each firing; cf. B. Homann-Wedeking, “A Kiln Site at Knossos,” *BSA* 45, 1950, p. 168. On the subject of kiln domes generally, see A. K. Orlandos, «Τα υλικά δομής των αρχαίων Ελλήνων και οι τρόποι εφαρμογής αυτών κατά τους συγγραφείς, τις επιγραφές και τα μνημεία. I. Το ξύλον και ο πηλός», Athens 1955, pp. 87–93, esp. pp. 91–92.

⁶⁹ Papadopoulos, p. 22, note 42. The smallest of the Roman kilns recently excavated in the Kerameikos (see Knigge and Rügler, *loc. cit.* [note 32 above]) has a diameter of approximately 0.60 m.

⁷⁰ Grandjean, p. 277, figs. 15, 16; Morris, pls. 103:c, 105:a, b.

“saggers” (or “saggars”).⁷¹ The primary purpose of pillars and saggers is to prevent pottery decorated with lustrous metallic glaze from sticking together in the kiln, especially if the glazes used contain a high percentage of silica, which fuses when heated in the kiln and forms a glossy surface very susceptible to damage during the firing.⁷² As far as I am aware, there is no verified use of saggers in ancient Greek kilns, probably because the common Greek clay glaze did not melt in the firing process in the manner that Oriental, Byzantine, and modern glazes do.⁷³ In any case, the shape of *λάσανα* precludes their use as pillars because they are bent above their midpoint to produce a curving profile, and also because they are equipped with a handle (Fig. 1).⁷⁴

Second, there are the demands of thermal shock. Given the shape and size of *λάσανα*, it is highly unlikely that they could withstand being repeatedly fired in a kiln; there is nothing in their appearance to suggest that they ever were.⁷⁵

If *λάσανα*, then, are unlikely pottery firing supports, why are they so commonly found, as Treister and Shelov-Kovedyayev maintain, in association with potters' kilns? There are two perfectly good reasons. First of all, *λάσανα*, like all clay vessels, had to be fired in kilns. The majority of those actually found in kilns, or nearby, are best seen as wasters.⁷⁶ Second, potters' kilns are usually located at a distance from the main settlement area of any town and are often found on the site of an earlier, or even contemporary, cemetery, the Athenian Kerameikos being only one such instance.⁷⁷ There is also the fact that any kiln firing takes

⁷¹ Jisheng (note 23 above), pp. 306–307, figs. 1, 2, p. 308, fig. 5; Fasheng *et al.* (note 23 above), various examples illustrated on pp. 318–319, figs. 1–3, figs. 5, 6; note also the paper, in the same volume, by Y. Wenxian and Z. Xiangsheng, “A Preliminary Study on the Porcelain Kiln in Ancient China,” p. 303, fig. 4:b.

A sagger or saggarr is a box or case made of refractory baked clay in which the finer ceramic wares are enclosed and protected while firing. Saggers are often supported in the kiln by a prop or pillar. “Spacers”, on the other hand, are wedges and the like placed between finer wares to prevent them from touching.

For modern usage, see Bourry (note 24 above), p. 397, fig. 276.

For a useful, well-illustrated discussion of saggers, see Barka *et al.* (note 24 above), pp. 478–480, figs. 257–270.

⁷² Noble, p. 155.

⁷³ *Ibid.*

⁷⁴ Morris, p. 393.

⁷⁵ As Morris (*loc. cit.*) has pointed out, most *λάσανα* are partially blackened, usually on the inside face, which is the side closest to the fire (as depicted on the Ricci hydria). Such blackening, or other traces of burning, is in accordance with the temperatures reached in an open fire, hearth, or other domestic fireplace. The temperatures reached in pottery kilns are significantly higher. Temperature estimates for Aegean Bronze Age fabrics range between 800° and 1050°C, and between 800° and 1100°C for Attic black glaze of the Archaic and Classical periods: Jones (note 51 above), pp. 795–804, table 9:8b. Note also the results of the study of the Protogeometric pottery from Asine by B. Hulthén and S. Olsson in B. Wells, *Asine, II, Results of the Excavations East of the Acropolis 1970–1974*, iv, *The Protogeometric Period, Part 2: An Analysis of the Settlement*, Stockholm 1983, pp. 139, 142–143, which have indicated a firing temperature for that material in the range of 600–800°C + . For vitrification to occur, as seen on some of the bellows' nozzles discussed above (p. 206; cf. Fig. 2), a temperature exceeding 1000–1100°C is required. The coarse, heat-resistant fabric used for *λάσανα* could easily withstand repeated use in a normal domestic fireplace, but their shape is not designed for repeated use in a kiln.

⁷⁶ *Λάσανα* found in numbers near kilns, as at some Russian sites, are all damaged and are usually found in debris along with other wasters.

⁷⁷ Papadopoulos, p. 13, note 10. For the Kerameikos see, most recently, U. Knigge, *Der Kerameikos von Athen. Führung durch Ausgrabungen und Geschichte*, Athens 1988.

up the greater part of a day, usually longer;⁷⁸ in these circumstances, *λάσανα* supporting, for instance, a chytra filled with a hearty broth for the potter's or fireman's lunch would not be out of place near a kiln.

There is one final objection for *λάσανα* seen as firing supports for pottery in kilns or as tuyères, provided by Aristophanes. In *Peace* (890–893), as Morris has so shrewdly pointed out, Trygaios and Slave initiate a culinary joke of obscene dimensions. The joke depends on the resemblance of Theoria's legs to a pair of cooking props.⁷⁹ In this case, Aristophanes could only have stirred an audience into laughter with a pun on Theoria's legs and τὰ *λάσανα* if the latter were a common part of any Greek kitchen.

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⁷⁸ During any firing of pottery there is usually an initial warming-up phase which is followed by the firing proper, at which time the fireman is continuously providing fuel: Cuomo di Caprio in *AGRP* (note 52 above), pp. 74–75; Papadopoulos, p. 18, note 22. In the firing of the Calke Wood kiln (Cook in *AGRP* [note 52 above], p. 65), Watson began a tanning fire in the evening and early next morning proceeded to the firing proper, which he kept going all day.

⁷⁹ Morris, pp. 398–399.



a. Detail of shoulder scene, Ionian hydria, Villa Giulia Museum



b. Athenian Agora P 15119 and P 30453 (below), supporting lopas P 30641 (above). 3:4

ΛΑΣΑΝΑ



c. Athenian Agora P 30453. 1:4



d. Athenian Agora P 15119. 1:4



e. Athenian Agora P 15119 and P 30453 (below), supporting chytra P 30640 (above). 1:6

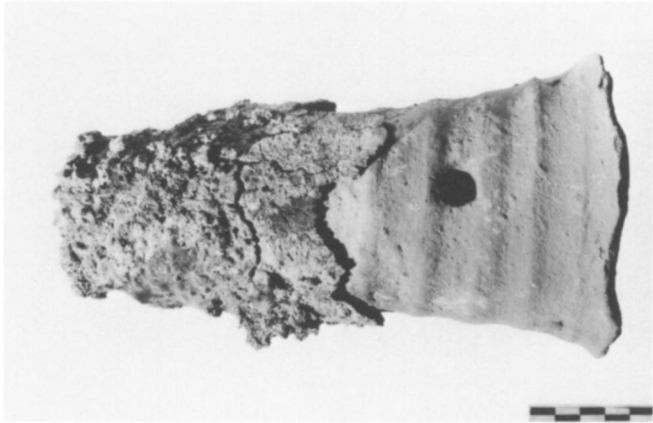


a. Athenian Agora P 23258



b. Athenian Agora P 30198

Tuyères



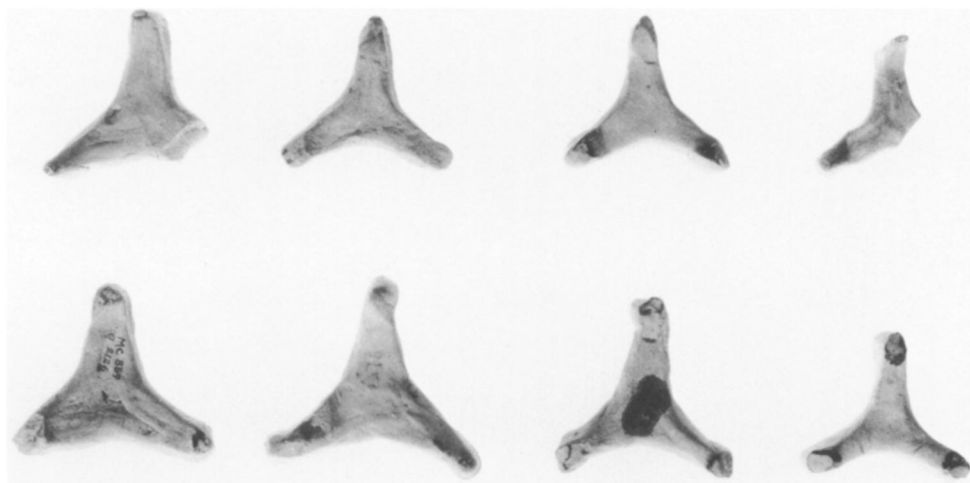
c. Athenian Agora B 1598



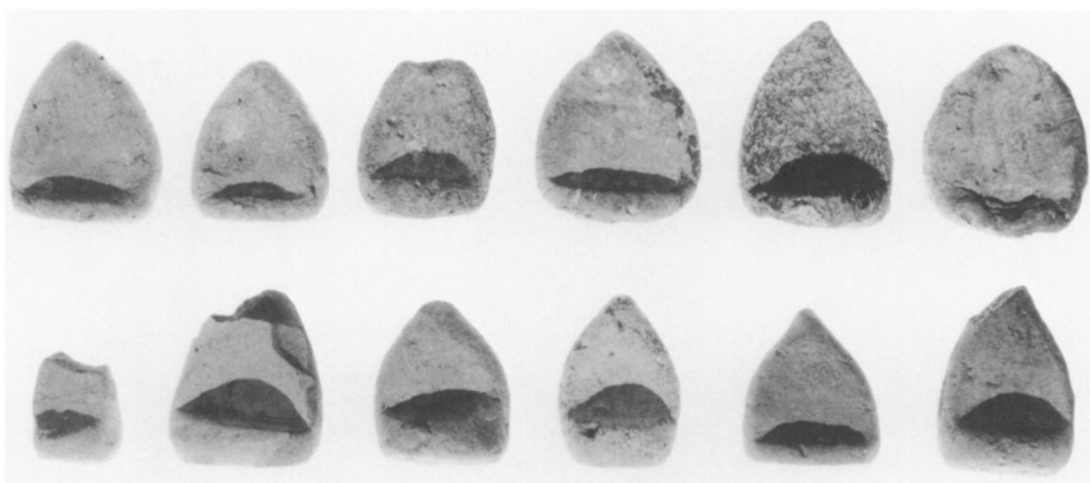
d. Athenian Agora B 1519



e. Athenian Agora B 1520



a. Athenian Agora kiln firing supports (tripod stilts). Top row, from left: P 194, MC 1107, MC 1106, MC 1102. Bottom row, from left: MC 859, P 204, MC 707, P 122



b. Athenian Agora kiln firing supports. Top row, from left: MC 703, MC 691, MC 710, MC 690, MC 1194, MC 704. Bottom row, from left: MC 947, MC 700, MC 476, MC 57, MC 702, MC 352



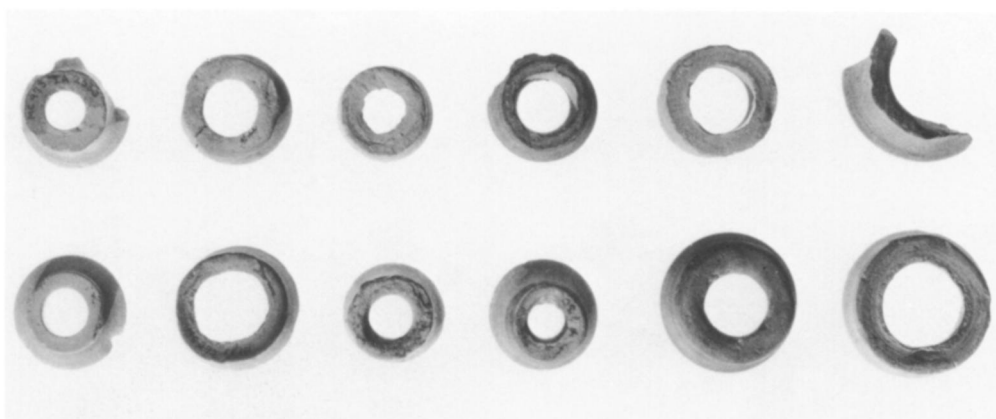
c. As above (side view)

Kiln Firing Supports

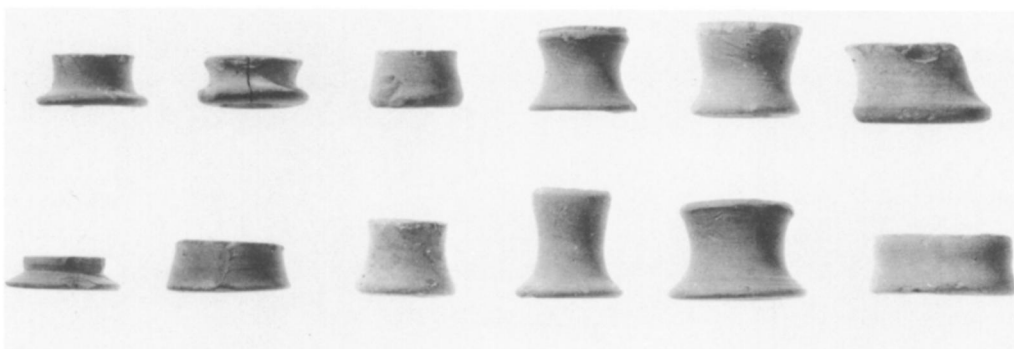
JOHN K. PAPADOPOULOS: ΛΑΣΑΝΑ, TUYÈRES, AND KILN FIRING SUPPORTS



a. Athenian Kerameikos, T-shaped kiln firing supports (Brennstützen)



b. Athenian Agora kiln firing supports (stacking rings). Top row, from left: MC 973, MC 579, P 8170, P 8169, P 17288, P 23226. Bottom row, from left: MC 775, MC 577, P 7688, MC 514, MC 201, MC 858

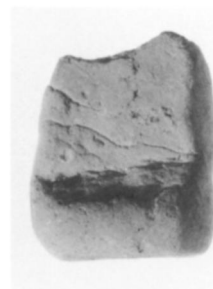


c. As above (side view)

Kiln Firing Supports



a. Athenian Agora P 17515, kiln firing support (?)

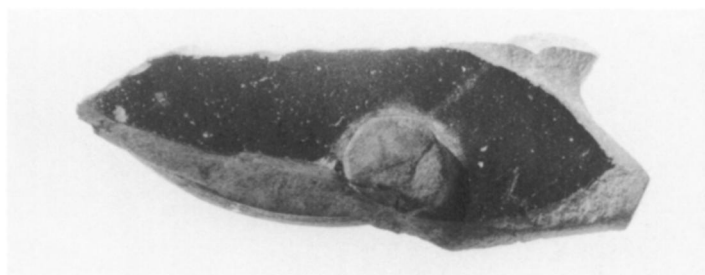


b. Athenian Agora
MC 947
(front view)



c. Athenian Agora
MC 947
(side view)

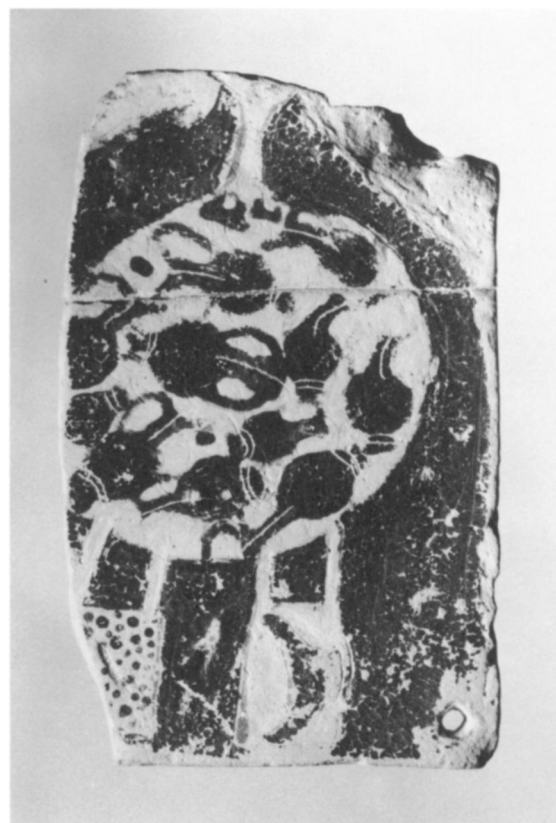
Kiln Firing Supports



d. Firing disk or pad fused onto Athenian Agora P 17105
(top view)



e. As above (side view)



f. Pinax from Penteskouphia near Corinth.
Antikenmuseum Berlin, F 893
(courtesy Antikenmuseum)