Archaeological Notes

SHALLOW-WATER EXCAVATION AT KENCHREAI: II

PLATE 49

During the 1968 summer campaign at Kenchreai, the eastern port of Ancient Corinth, further exploration and excavation were conducted along the shore and within the deeper harbor waters.[1] At the South Pier we excavated to some depth the types of fill found along its northern side. Here we gathered many examples of fine Roman glass, fine and coarse pottery, and organic materials from an ancient dump which was sounded in 1964.[2] Trenching along the unexplored shoreline in the center of the harbor produced interesting stratigraphic evidence alongside and under a heavily built wall bordering the shore, adding much to our understanding, albeit still incomplete, of water level at Kenchreai during early Roman times. On the North Mole we exposed a hitherto unsuspected pavement by clearing silt, gravel and large piles of stone from its southern tip. Further inshore some unusual architectural remains came to light during the final days of the season. Full archaeological description will appear later; in this note I will limit myself to describing a technical improvement made over the digging procedure used in previous seasons.

The most useful tool used for underwater excavation in 1968 (pl. 49, figs. 1-2) was a special adaptation of a dredge used for mining gold in rivers and lakes of the western United States.[3] As an excavation tool, the dredge has not yet been fully exploited by archaeologists, although experiments are being conducted elsewhere—in Italy by Peter Throckmorton[4] and recently at Porto Cheli (Halieis) by Michael Jameson. In the United States, the dredge was recommended for archaeological work as far back as 1961,[5] although when discussing the Mediterranean area one author reported in 1963 that "No instruments have been designed to dig in shallow water. Existing dredgers would be out of the question, while the airlift . . . works only at depth."[6] Aside from its novelty, however, the dredge is so versatile and economical that it should soon replace other shallow-water tools such as the airlift[7] and high-pressure water hose.[8]

The dredge resembles the airlift inasmuch as suction is used in both cases to carry away excavated material. Unlike the airlift, however, water rather than air pressure is used to create suction. In the dredge, water at high pressure is shot obliquely into a long pipe near one of its ends, the "exhaust end" (pl. 49, fig. 3), and suction for excavation is created at the other, open, end of the pipe which can be equipped with a flexible rubber hose. The excavator can then "fan" sand and gravel into the intake, and these waste materials will be carried the length of the pipe to be deposited in the dump area. Fortunately, the dump can be established some distance from the excavation site, either underwater or on shore.

In the work of the diver-archaeologist, the dredge will not tend to dig pits as does the type of airlift often used, although we discovered that in the case of the airlift this problem can be partially prevented by equipping the lower end with a "spoon" on which to rest (pl. 49, fig. 4). The dredge also proved to be much more maneuverable and less tiring than the airlift: there is less weight for the diver to control, since the entire dredge assembly lies on the bottom, pointing away from the excavations, while in most cases the airlift is partially suspended vertically or on a slant above the trench. Another advantage of the dredge is that clear water can often be guaranteed in the excavation area. Not only is clear water drawn in from the surrounding area by the very strong suction created, but the dump can be some distance away, downcurrent, so that mud and sand clouds dissipate harmlessly. When airlifts are used in shallow water, on the other hand, some excavation debris tends to fall back into the area where the divers are working.

The versatility of the dredge is amply proven by its ability to dig in the shallowest water, for example in fig. 5 where a trench begun at ca. 0.20m. below water level was eventually extended to a depth of over 2m.

[1] For recent reports, see R. Scranton and E. Ramage, "Investigations at Corinthian Kenchreai," *Hesperia* 36 (1967) 124-186, also J. Shaw, "Shallow-water Excavation at Kenchreai," *AJA* 71 (1967) 223-231. Personnel aiding in the excavations underwater (only a phase of the season's archaeological activity at Kenchreai) were Professor Robert Scranton, Co-director of the Kenchreai excavations; Joseph W. Shaw, graduate student at the University of Pennsylvania and excavation architect at Kenchreai, who organized and supervised operations underwater; participating were Dr. Robert Hohlfelder and the following graduate students: Donald Dupont of Indiana University, Alice Swift Riginos, E. Hector Williams, and Judith Rubenstein of the University of Chicago, Vasilis Riginos of Columbia University, and W. W. Cummer of the University of Pennsylvania. Harilis Kotsovos was both diver and boat captain; Dimitris Dragonas was chief diver; Robert Scranton, Jr. assisted.

[2] *AJA* 71 (1967) 226.

[3] In our case ordered through H. O. Fiedler, 427 Hamilton Street, San Francisco, California, to whom we are much indebted for his patience and advice.

[4] *AJA* 71 (1967) 231 n. 18. For recent work at Halieis mentioned infra, see *Hesperia* 38 (1969) 331 and n. 41.

[5] D. P. Jewell, "Fresh-Water Archaeology," *American Antiquity* 26 (1961) 416; "Limnoarchaeology in California," *Diving into the Past* (St. Paul 1964) 29.

[6] H. Frost, *Under the Mediterranean* (London 1963) 69.

[7] *AJA* 71 (1967) 229.

[8] Ibid. 229. I should point out, however, that a water jet can in some cases forcibly loosen very hard-packed or concreted fill, whereas when digging in a hard stratum with a dredge the excavator must do his own work with a pick. In future the hose might be separated from the dredge and a firehose nozzle attached to the hose.

Moreover, the relatively light weight of the dredge assembly allows divers to move it easily from one area to another. The pump and engine, which are coupled together, can be mounted on shore or on a boat as far as 30 to 40m. (horizontally or even vertically) from the actual excavation site. The pace of work underwater is normally slower than on land, for a number of reasons; the dredge can still be used, however, to move a number of cubic yards of fill in a relatively short time, depending on the size of dredge used and the types of fill being excavated. In cases where extreme care is needed the diver can regulate the pace of digging, so that he can recover small sherds, coins, jewelry, even such a tiny object as a bit of gold granulation found this year, before they enter the pipe (as in pl. 49, fig. 6). On the other hand, a coarse unproductive strosis can be cleared away quickly if the hose is used directly, as in fig. 7. If the front of the nozzle used for digging is barred (fig. 6) the clogging of stones, tiles or sherds within the pipe is almost permanently prevented. In fine mud, sand or gravel the barred nozzle can be removed and replaced by an open one (fig. 1). Depending on digging conditions, excavators can even work standing up, as in fig. 8. Careful work with this machine, sharp eyes, and immediate measurement of objects when found in situ make feasible useful stratigraphic studies, once thought to be impossible under water.[9]

JOSEPH W. SHAW

AMERICAN SCHOOL OF CLASSICAL STUDIES

TWO ARRETINE MOULDS FROM THE EARLY WORKSHOPS OF M. PERENNIUS

PLATE 50

The ceramic collections of the Victoria and Albert Museum in London contain the two fine, complete moulds described here. The history of their discovery and travels before their deposition in the Museum in 1910 has not been recorded. It is, however, a fair assumption that they, in common with many other moulds and vessels of the early slaves of M. Perennius, were unearthed in or near the churchyard of Sta. Maria in Gradi in Arezzo, the site of one of the best known production centers of Italian Terra sigillata.[1] From Sta. Maria in Gradi have come several moulds of the same two craftsmen here in question, the slaves Nicephorus and Pilades. Most of these now repose, largely unpublished, in the Museo Archeologico di Arezzo.

I. Mould stamped M PERENNI NICEPHOR (pl. 50, figs. 1-2).

The breaking off of two small fragments has slightly damaged the heads of two of the figures, but otherwise the mould is entire. The main decorative scheme comprises four kalathiskos dancers, with an elaborate acanthus motif placed between each pair of figures. Of each pair, one clasps both hands to her breast, the other throws the right hand clear of her body. All wear the short Doric chiton and the characteristic basketwork head-gear. The acanthi are surmounted by birds. The main zone of figures is limited above by a border of rosettes, underlined by a beaded border, and below by a circlet of olive leaves and fruit. Beneath the latter, another beaded border rounds off the decoration.

Kalathiskos dancers are one of the commonest motifs on the earliest Arretine vessels. It will be sufficient to refer to only a few of the closest analogies:

1. Stamp of kalathiskos dancer, with both hands clasped to her breast. *CVA* USA. The Metropolitan Museum of Art, New York. Fasc. 1 (1943) pl. 1, 1.

2. Mould stamped PERENNI CERDO. G. H. Chase, *The Loeb Collection of Arretine Pottery* (New York 1908) Cat. no. 53; pl. III. The dancers are shown in the same poses as on the Victoria and Albert mould, but between each pair is a tripod standing on a carved base (cf. mould of Pilades discussed infra). The background is decorated by bucrania from which hang swags. Cf. *NSc* (1884) pl. 7, 2.

3. Mould stamped (M PERENNI) TIGRANI. G. H. Chase, *Catalogue of the Arretine Pottery in the Museum of Fine Arts, Boston* (1916) Cat. no. 31, pl. XI. The dancers appear as on the Victoria and Albert mould.

4. Mould stamped PERENNI PILEMO. *CVA* USA. The Metropolitan Museum. . . . Fasc. 1 (1943) pl. XVI. On this specimen, all four dancers clasp both hands to the breast.

II. Mould stamped PERENNI PILADES (pl. 50, figs. 3-4).

This mould is entire, but broken into three large sherds. The main design is of two pairs of winged female musicians, one playing the double flute, the other the cithara. Between the figures of each pair is a large tripod on a base which bears a sculptured relief of three draped dancers. Each figure is bare-

[9] In terms of economy, the cost of a medium-sized dredge, transportation to Greece and import tax included, is less than one thousand dollars. Doubtless much less expensive versions could be assembled locally. A small compressor, volume tank, and air hose can be attached to the motor so that a narghile (or hookah) rig can furnish air to the divers. In other words, one can buy the entire dredge outfit for the amount that a single shallow-water airlift ensemble would cost to rent for two months' time. Our own dredge had a 4" opening for the suction hose, which worked well in most situations. A fairly heavy-duty compressor is to be recommended, capable of furnishing air to two divers at once and of running for many hours at a time.

[1] Cf. Gamurrini, *NSc* (1894) 93ff.

FIG. 1. Dredge components: L-R, excavator with intake, exhaust, motor with pump intake

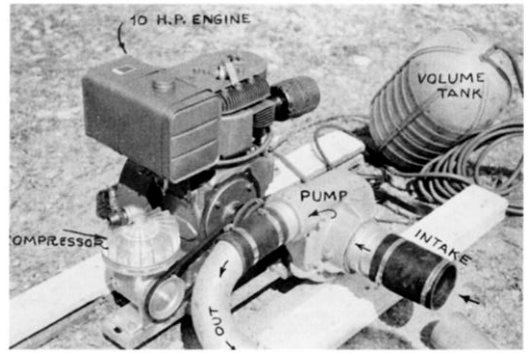

FIG. 2. Detail of pump assembly

FIG. 3. Dump area

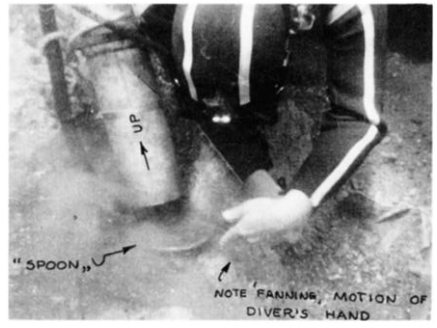

FIG. 4. Detail of bottom of airlift (photo V. Riginos)

FIG. 6. Diver fanning into cross-barred dredge intake

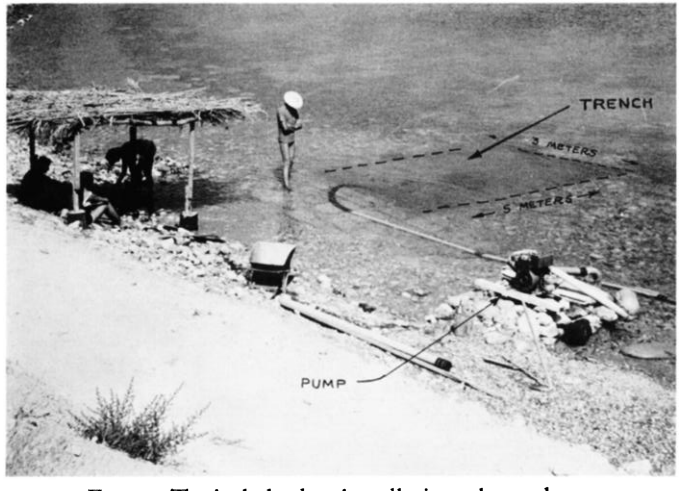

FIG. 5. Typical dredge installation along shore

FIG. 7. Digging in fill with open dredge intake

FIG. 8. Excavation of paving blocks, tip of North Mole (photo G. Faure)