Minoan and Greek Kato Syrne sanctuary site with her colleague and Director of the excavation, Angeliki Lembessi. David Wilson, of the University of Western Ontario, has dealt with Early Minoan pottery and architecture at Knossos, especially the buildings below the western court of the palace there. To the above and many others (for this list is far from complete), the ancient, welcoming island of Crete has been a rich field for archaeological research.

We have briefly reviewed the steps taken by North Americans to involve themselves in the investigation of Crete. We have also seen how the imagination, initiative, and devotion of a few pioneers—Boyd, Seager, and Hall—contributed to the study of Minoan and early Greek culture in the eastern part of the island.

Now, during the third phase of our work, that of the past two decades, we can consider the initiatives taken. For example, the popularity of re-examining the old sites is striking and certainly a tribute to the wise choice of Boyd and her associates. It is also significant that five of the principal investigators of the sites (Betancourt, Hayden, J. Shaw, Solos, and Watters) received their doctorates from the University of Pennsylvania, where she has so much earlier worked in Crete. The return to Crete is also partly due to the growing awareness that the island’s distinctive prehistory and formative stages gave impetus to the Graeco-Roman culture, a culture that would eventually provide much of the basis for the European civilization that we in North America have to a large extent inherited.

It is of compelling interest to imagine how this present phase will end, a matter that only our successors will be in a position to evaluate. What substantive new results will the work produce? To what extent will old ideas be renewed or modified, new material and new concepts introduced? In the meantime the debate concerning aspects of Minoan and Greek culture in Crete will continue as we discuss issues with, among others, our Greek, English, French, German, Italian, and Swedish colleagues. Each of them could tell a tale of archaeological commitment and achievement similar to, if in some cases greater than, the one sketched out above.

Figure 15. Barbara Hayden and Jennifer Moody, the surveyors from Vrokastro. Photo courtesy of B. Hayden

The Stone Vessels of Pseira

PHILIP P. BETANCOURT

"Never...have I seen so many stone vessels in so short a time."

Richard Seager, letter to Edith Hall from Pseira, 24 May 1907

Like a great many islands in other periods of history, the small Minoan islet of Pseira seems to have depended on its harbor and trade relations to compensate for poor land, few natural resources, and a hungry population. Pseira is only about two kilometers long. It is located just off the coast of northeast Crete, at the eastern end of the Gulf of Mirabello (Fig. 2). The Bronze Age town, set around the island’s most protected cove, was a prosperous village with over 60 buildings at its greatest size. Imports of pottery and other goods show that it had far-flung trading connections at the time it was destroyed in Late Minoan IB (about 1500 or 1450 B.C. depending on one’s choice of high or low chronologies for the Minoan period). In order to add its own products to the trade network, Pseira seems to have developed a series of local manufacturing traditions. Among the most interesting of the local products was an attractive selection of stone vessels. The use and manufacture of vessels in stone began in Crete in Early Minoan II (the middle of the 3rd millennium B.C.). From the beginning, the motivation may have been

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Bibliography


See "Annual Reports of the Archaeological Institute of America for 1980-1981 and 1983-1985 for information on Stillman's and Halbherr's work. For other references relating to the Boyd/Seager/Hall excavations, see bibliographies in articles by Betancourt, Gessel, Hayden, and Moody in this issue. Letters of Boyd, Hall and Seager are available in The University Museum Archives.

Figure 1. Bird's nest shown in situ in Tomb 2 at Pseira. It dates from the Early Bronze Age. The corbelled band at Pseira held many birds, and small stone vessels like this one were frequent offerings. The small size of the case suggests it held a precious commodity that was used in small quantities, such as a perfumed unguent.
by families. Only a few objects were buried with the dead, but stone vessels were regular offerings. A burial illustrated here (Fig. 1) is part of a small stone-tomb in the Peisra cemetery. Beside the frag-
m ents of bones is a small vase called a bird's nest bowl because of its resemblance to a small nest. Made of mottled dark green and pale green serpentine, bird's nest bowls were common offerings in the Peisra cemetery. They were given tightly fitting lids, with vase and lid usually made as a set, but some were not finished yet or of the same material. The interiors are small, and the walls are rather thick, making a stable, heavy vessel. Unfortunately, no deposits have been found in the interior of vases that might give clues to their use. The most likely theory for the vessel's use is that they contained perfumed unguents, thick oils prepared with scents to anoint the body and offer protection against the hot Mediterranean sun as modern sun-tan creams do. Bird's nest bowls are found in the town as well as the cemetery, so they were objects of everyday use in addition to being offered to accompany the deceased into the next life.

The industry expanded in the Middle Bronze Age. It is possible that vases were already being produced locally by the Early Bronze Age, but certainly there were already local products by Middle Minoan times. Shapes were now more varied, and walls were thinner and more finely formed. The small cup in Figure 3 is an example from the Middle Bronze Age. Attractive open bowls, closed containers in several designs, and even vases with complicated spouts were made on a regular basis. The Minoans developed several typical vase shapes, especially for pottery, and these were sometimes imitated in stone. Other vessels were designed exclusively as products in stone.

The height of the stone vase tradi-
tion at Peisra, both in quality of vases and in skill of manufacturing, was in Late Minoan I. It is difficult to be sure how many of the Late Minoan I vases were actually made on the island, but certainly many of them were local products. Among the stone vases found at Peisra are some of the more attractive products of the stoneworker's craft.

The recent excavations have con-
tributed substantial evidence for the
lapidary industry at this period. Besides dozens of examples of the
finished products, the site has yielded unworked pieces of raw material up to boulder size, frag-
ments of emery used in drilling, cylindrical stone cores formed inside the drills during drilling, and several broken and discarded pieces from unsuccessful vases. As a result, the industry can be traced from raw material through manufacturing to the use of the final products.

A wide variety of materials were used by the Peisran stone workers, but all were relatively soft. So far, no evidence has appeared for the working of the quartz family of stones except for miniature objects, and it seems likely that stones with a hardness above six on the Mohs' scale—like the quartz crystal vases occasionally found at other sites in the Aegean—were seldom if ever used on Peisra. By far the most favored material was serpentine. The Peisrans were fortunate that a large deposit of compact material existed just east of the modern village of Mochlos, within easy reach of Peisra by small boat. The serpen-
tine occurs in a large formation in a ravine that extends down to the sea to a small beach, easily accessible by boat. The Bich of the serpentine from this outcrop is mottled gray to dark green, exactly matching the color of both finished vases and blocks of unworked stone found at the Minoan town.

Other materials, including several serpentine types different from that of Mochlos, are also found among the Peisran vases. The material called serpentine is a family of minerals, not a single substance, and it almost always occurs with many impurities, so the color can vary widely. Colors at Peisra extend from gray to green to black to brown, usually with some variation even if the material is solid and compact. Probably several sources were exploited for raw ma-
terial, and occasional finished products from other Minoan towns were probably imported for their contents for other reasons, making for a complex archaeological record.

Some of the raw materials were brought in from distant areas. Finds of small waste pieces of white- spotted obsidian from the island of Chyale, in the Dodecanese, show that this exotic material was occasion-
ally made into objects at Peisra. Obsidian from Chyale is one of the few materials for which scientific analysis has confirmed that only a single geological source was ex-
plained in the ancient Aegean. For most of the materials used at Peisra, either no scientific provenance work has been done yet or the results have not been conclusive. Finished vases have been found at Peisra of marble breccia, white and gray banded marble, brown limestone, red lime-
stone, mottled white calcite, banded white and golden brown travertine, aeolian sandstone, and chlorite schist. Of these stones, only chlorite schist, red and brown limestones, and sandstone have been found as raw materials, but it is likely that all of these stones were worked at Peisra because many of the finished prod-
ucts appear to be related stylis-
tically.

The inventory of shapes expanded

Figure 2. The islet of Peisra lies at the eastern end of the Gulf of Mirabello.

Figure 3. A small spouted cup with a lid and one vertical handle. This unusual shape is found only Peisra, Gournia, and the Cycladic island of Ken. The group may have all been made at Peisra.

Archaeological Museum, Herakleion, no. 1122

Figure 4. Serpentine goblet consisting of a conical bowl and complex pedestal base. This type is very rare in Minoan Crete, and some scholars suggest they were used for rituals or ceremonies.

Archaeological Museum, Herakleion, no. 1122

Figure 5. A rhyton made of colorful red and black marble breccia. The vase has two openings, one at the top for filling and a second, smaller hole at the tip which would cause the liquid to run out. The exact function of the vessel is not known, and suggestions include use for libations or for adding flavors by pouring a liquid over spices or other materials placed inside the case. Some scholars suppose it might have been used in rituals.

Archaeological Museum, Herakleion, no. 1128
Archaeological Work at Pseira

Pseira has been excavated in two periods. The first two campaigns, in 1906 and 1907, were directed by Richard Seager and were sponsored by the American Exploration Society, a private organization with ties to The University Museum. Seager uncovered more than 40 graves and opened 33 graves in the nearby cemetery. Many objects from his excavations, including a number of stone vessels, were presented to The University Museum by the Cretan authorities at the conclusion of the excavations. New archaeological work began in 1985 and is still continuing today under the direction of the writer and Costis Davaras. The new excavations are sponsored by Temple University, the Archaeological Society of Crete, and the Archaeological Institute of Crete. Significant new information has been discovered in the new campaigns, and an important observation of Seager's has been confirmed: Pseira was a center of the stone vessel industry in Crete, and its residents used stone vessels in many materials and in a wide variety of shapes.
a few complete pieces. In terms of style and manufacturing skill, the nicest of the complete vessels is a small spotted jar (Fig. 9). Like the red limestone lamps, it is decorated with carved petals. The jar was found in one of the ground floor rooms where a tile had fallen and broken at the spot and rim. Its shape, with two small handles at the rim and a tiny spout, is unique, petals enclose the small jar’s body as if the entire shape were intended as the blossom. The material is mottled serpentine.

The Plateia House is the largest building known from Minoan Peira (Fig. 10). It extended across the northern side of the Town Square, in Greek called a plateia, and one room extended south along the eastern side of the square. Its entrance, at the plateia’s northeast corner, was shaded by a small portico where stone benches sat. The importance of the structure is indicated by its impressive architecture, with a facade of large squared blocks across the northern side of the square, as well as by its decoration which included painted plaster (small bits with red and blue color were found in the modern excavations).

One of the most important aspects of the building is the evidence it provides for manufacturing. Besides the obsidian tool making and food preparation one might expect from any Minoan household, the Plateia House also provides evidence for weaving (loom weights), the working of triton shells (a complete example and many fragments), the working of quartz crystals (over 20 crystals and a complete pendant), and the making of stone vessels.

In the Plateia House the evidence for stone vase manufacture included finished vases, materials that could have been used in their manufacture, and debris discarded from stone vase making. The evidence came from occupation debris scattered through several rooms, so that a specific workshop could not be isolated. Over 20 whole and fragmentary stone vessels were found in the building itself, and other pieces were in debris from its collapse into the adjoining streets and plateia. A drill press in a tubular drill during the drilling process, was also found in the building. Materials that might have been used in the manufacturing process, like punice and emery, are also found at Peira, although there is no way to prove that a particular piece was used in the making of stone vessels.

The vase industry of Minoan Peira can be completely reconstructed. From the types of raw material found, it appears the Peireans preferred to pick up rounded pieces of attractive stone from a stream or beach in preference to quarrying their material from outcrops. Some of the rounded pieces brought to the town were fairly large, while others were hand-sized specimens. Perhaps the workers felt that by careful selection they could choose a piece of raw material that was near the size of the intended product, saving time in the working of the stone.

The first step was a general work of the external shape. This stage will have revealed cracks or other flaws before the time-consuming process of drilling the interior. The top was then flattened, and the interior was drilled. The flattened top, necessary so the drill could begin with a good purchase, shows up clearly on the cores discarded after drilling.

The Aegean drilling system was similar to the process used in Egypt. The drill was a hollowreed that was turned with a rotary motion. The cutting was accomplished not by the drill itself but by a powdered abrasive. When the core would catch in the end of the drill and wear away the stone. As the drill moved lower into the core, a drill core would be created inside the hollow drill, to be broken and thrown away when the cavity was as deep as desired. Fragments of emery have been found at Peira, and powdered emery, with a hardness second only to diamond, would have made an excellent cutting powder.

After the interior was complete, the vase could be finished. Early vases show rotary marks inside them from the drills, but by the Middle Bronze Age the interiors were carefully smoothed. Vases were completed by polishing, bringing out the pattern of the stone and producing a smooth final surface. A material like punice would be very useful in polishing vases, and one wonders if some of the over 50 pieces found in the Plateia House were destined for this use.

Peirean vases were probably traded widely. It is hard to identify most of the sources for Cretan stone vase manufacture because individual workshops are difficult to classify in ways that would distinguish the products of one town from those of another. A twin to the rhyno of red and black breccia was found at Knossos, and it is tempting to suppose that it was imported there from Peira because Peira is near the source of the raw material, and several other breccia vases are known from the island. So many vases from Peira have carved petals on their exterior surfaces that one wonders if some of the vases found with this careful decoration from other sites might not have originated at Peira. An elaborate cup with a rim spout and a strap handle at right angles to the spout, decorated with nicks and horizontal grooves, is known only from three Peirean examples, one from nearby Gournia, and a fifth piece exported to Kea in the Cyclades, a certain Creton export. Peira seems the most likely source for this distinctive group (Fig. 3).

Perhaps the lapidary industry helped to compensate for the absence of clay on Peira where pottery was probably never made locally (neither good clay nor an abundance of fuel for ceramic kilns was ever available on the island). Because large amounts of pottery were used on a daily basis, and it all had to be imported, one must suppose the Peireans needed local products to exchange, plus at least a few locally made containers to act as substitutes. As one solution, the Peireans turned to an alternative material, with the result that they created a lively tradition of interesting, attractive, and useful containers.