

chaeologist a rare opportunity to study a changing architectural setting, to coordinate it with the artifacts distributed within and to use this information to formulate questions about societal organization in the Cyclades. House A is not palatial in character, as claimed at the outset of this volume (p. 1); instead it should be viewed as part of an Aegean town, especially a Cycladic one. The long and precisely datable evolution of the building sharpens along historical lines questions about the changing importance of Ayia Irini to the ship lanes from the Mainland through the islands to Crete. Why does House A achieve its grandest form only in LM IB after the volcanic eruption of Thera? Perhaps these problems will be investigated in future studies of the Ayia Irini excavation. They have already begun to be examined in a host of articles dealing with Ayia Irini and the Cyclades, and it is perhaps because of these that I had hoped to find more analysis in this volume.

These criticisms aside, this is a publication that can be profitably used. The detailed plans, sections and descriptions of the structures allow the reader close study of the architecture. The orderly and complete catalogue permits room-by-room analysis, and Schofield's commentary on the ceramic material and the stratigraphy will be required reading for students of this important period in Aegean prehistory.

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KEOS 4. AYIA IRINI: THE POTTERS' MARKS, by A.H.

Bikaki. Pp. xv + 64, pls. 28, tables 4. Philipp von Zabern, Mainz 1984.

Over a full generation ago, Alice Kober (*AJA* 52 [1948] 100) offered a discouraging view of the state of research on Bronze Age Aegean potters' marks: "pottery marks have been published in such a scattered and desultory fashion that no conclusions of any kind are possible." Kober's appeal for a comprehensive, systematic approach to the study of a class of data widely distributed by period and by site was hardly unreasonable. Provided with the right kinds of information, one can use potters' marks to investigate such topics as the patterns and process of Aegean trade, the operation of local pottery industries and, to some extent, the development and relationship of Aegean writing systems. We are just beginning to do this. Until recently Kober's statement had evoked a desultory and scattered response, reasonable progress being made only on Cypriot material, primarily by researchers interested, since Daniel's seminal study (*AJA* 45 [1941] 249-82), in Cypro-Minoan writing: Masson, *Minos* 5 (1957) 9-27; Benson and Masson, *AJA* 64 (1960) 145-51; and Åström, *OpusAth* 9 (1969) 151-59. Thus Crouwel, in a condensed critical survey of strictly Aegean pot marks (*Kadmos* 12 [1973] 106-108), could still justifiably lament the paucity of well published material, while placing his hopes on forthcoming publications which regrettably, a decade later, have not yet appeared. Döhl's

two-part treatment of the Tiryns material (*Kadmos* 17 [1978] 115-49 and 18 [1979] 47-70) was the first study of a sizable corpus of potters' marks (90 marked vase fragments) from a single site in the Bronze Age Aegean to conform to the standards that I imagine Kober had in mind. It is a delight to discover that Bikaki's *Keos* 4 is another.

Here is no perfunctory catalogue of consolation-prize excavation material, but an analytical presentation of data from which the author reaches well reasoned conclusions, whether definite or tentative, about central problems related to Aegean potters' marks. The Ayia Irini corpus (205 vase fragments bearing primary marks made before firing) is second in number only to the recently published Mallia corpus. The Keos pieces come mainly from stratified deposits throughout the site. They spread over all but the earliest of the eight periods of occupation (EB through LB) clearly presented on pp. 3-4, but are concentrated in periods IV-VII (MB through LC II/LM IB/LH II). Such spatial and temporal distribution makes it possible to focus on three major questions outlined in the Introduction and discussed in the concluding Commentary: 1) whether in given periods the potters' marks constituted a system, either particular to Keos or shared with other Aegean sites; 2) whether the known Aegean scripts influenced either the types of marks used or the frequency with which they were used; 3) what purposes the marks served in different periods.

The material is arranged by period. In each section the descriptive catalogue is preceded by an introduction that identifies discernible stylistic categories of marks and their relationship to marks at other sites and in other periods. Reference is made consistently to four convenient tables (pp. 44-51) which furnish the necessary breakdown of categories of marks by period; locally made and imported pieces, first generally by period and next specifically by categories within periods and sub-periods; and find-contexts by period, lot number and location. The tables are followed by concordances, a general index, and a two-page site plan. Very clear photographs are provided of all pieces; drawings of 137. Drawings of pieces IV-89 and VI-21, about which the author raises questions of identification, would have been appreciated. A more serious *peccatum omissionis* is the exclusion of the admittedly few (p. 3) pieces with signs incised after firing. It runs counter to general practice (e.g., Daniel, Döhl), which recognizes that marks made after firing can have special relevance to questions of trade or the spread and influence of marking systems (Palaima, Myer and Betancourt, *Kadmos* 22 [1984] 70).

Central among the results of Bikaki's work is the documentation of actual *systems* of potters' marks. Crouwel's survey of the material then available had stressed the apparent lack of any such standardization. At Ayia Irini, however, marking systems develop in Period IV (MB I-II): one strictly local system of fingernail marks (cat. 1a); another system of oval/round impressions (cat. 2) used in common with Melos, Aegina and perhaps Lerna. In Period V, the spread of the Linear A writing system, now documented at Keos, transforms the picture. The local system disappears. The wider Aegean system continues, even into periods VI and VII, but on a much reduced scale and almost entirely on imports. A system of linear marks, displayed prominently on

the vessels, takes over. The function of the new system seems to be some sort of labeling in contrast to the practical purposes, specific to the pottery industry, served by the earlier systems. Such conclusions depend upon careful interpretation of the assembled data (numbers and percentages of imports/exports, typological categories, formal comparison with material from other sites, physical description of the inscribed pieces) and general historical factors (settlement history, established trade networks, history of formal writing systems). Future studies would do well to take notice.

The one general weakness of this otherwise model study is the insistence upon "interpreting the meaning" of individual marks by looking for similarities with established systems of signs (Linear A, Linear B and metrical signs used on weights). This area is obviously outside the author's expertise. Discussions of hypothetical equivalences to the metrical weight signs (V-15, V-16, VI-21) make no reference to Petruso's full study (*Kadmos* 17 [1978] 26-42), the final signary of which (table 2, no. 11) invalidates the author's hypothesis about V-15 and V-16. The direct correspondences to Linear writing are far less certain than the cumulative weight of the author's frequent, although qualified, suggestions makes them appear. Particularly tenuous are the correspondences proposed for VI-1, VI-2, VI-8, VI-9, VII-41, VII-42, VII-28-30. Use of Brice's now superseded corpus as the primary (sometimes only) reference to Linear A characters and texts may be taken as a sign of incomplete updating of a manuscript completed in December 1981.

Other criticisms concern matters outside the author's control (e.g., statistics that should have been recorded during excavation) or quickly reach the picayune. Let me reiterate: future studies would do well to take notice of the format and method of *Keos* 4.

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EAST CRETAN WHITE-ON-DARK WARE. STUDIES ON A HANDMADE POTTERY OF THE EARLY TO MIDDLE MINOAN PERIODS, by Philip B. Betancourt et al. (University Museum Monographs 51.) Pp. xx + 176, pls. 22. The University Museum, University of Pennsylvania, Philadelphia 1984.

Pendlebury in 1939 started his chapter on EM III in *The Archaeology of Crete* by stating that "the Early Minoan III Period is a curious and difficult one to define." The reasons for this are well known: first, the relative scarcity of EM III pottery and the removal of EM III remains in connection with later building activities and, second, the stylistic differences in the material from different parts of Crete during that period. When Evans created his system of classification and relative chronology for the Cretan Bronze Age, he described EM III pottery in terms of the East Cretan White-on-dark ware (although no comprehensive study of this ware existed), despite the fact that the system otherwise is based on Knossian material. The gap between EM II and MM I is, however, now on the way to being filled. Hood's

excavations at the Royal Road at Knossos in the 1950s brought to light pottery decorated in the same technique, if not in the same style, as the East Cretan pottery Evans had described, and a publication of this material is eagerly awaited. It is also now possible to a large extent to distinguish Central Cretan EM III material from MM IA (Walberg, *Provincial Middle Minoan Pottery* [Mainz 1983] 90-109, *passim*).

The present study of East Cretan White-on-dark pottery consists of two parts: one, by Betancourt, deals with the style and the chronology of the ware, and the other with scientific analyses resulting from the work of a team of specialists from several different disciplines over some years. There is also a catalogue of analyzed material.

The material treated is not restricted to EM III, but also includes EM IIB, when the light-on-dark technique first appears, and MM I, which represents a direct continuation of many of the characteristic features found in the two previous phases. Betancourt has divided the material into three different phases, Early, Middle and Late, which correspond to EM IIB, EM III and MM IA respectively. The study starts with a definition of the different phases and of the find contexts of the East Cretan White-on-dark ware. The author properly points out that although MM IA begins with the introduction of red paint and MM IB with the introduction of the potter's wheel, there are many vases in these two periods which continue to be decorated with white paint only and also to be manufactured by hand—facts which make evident the danger of looking exclusively at such technical criteria. Betancourt finds it likely that a phase in which simple white decoration was used predates MM pottery throughout the island of Crete; this conclusion agrees with the results of my studies of the beginnings of MM pottery. The decoration was, however, less frequent in Central Crete than in the East and much less elaborate. Betancourt places the deposit from House D at Mochlos in his Late Phase on the basis of the presence of some cups with red bands and carinated cups. The style of the decoration is, however, still EM III, and I would therefore suggest retaining the transitional date suggested by Seager. In the case of House B at Vasiliki, Betancourt suggests a MM I date for a jug with cross-hatched semicircles on the shoulder. According to Zois, the shape is "perfectly at home in MM I." It is, however, rather rounded and smooth compared to that of most MM IA jugs, which tend to be more angular, and this fact, in combination with the decoration which is closely related to EM III disc spiral motifs from Gournia and Mallia, seems to me to indicate that a late EM III date would be more appropriate. Since there are also some later, MM vases from House B and since the material, according to the excavator, had been much disturbed, I believe that House B contains a mixed deposit.

The individual decorative motifs found on the White-on-dark ware are carefully examined and presented with line drawings, and their later development is also noted. The chapter includes a catalogue of these motifs, and there is a short, fine analysis of the composition or syntax with examples of the two main types (tectonic and unity). Betancourt also points out that the two types were not as developed as in later, MM pottery and that several vases are intermediate