

# INVESTIGATIONS AT CORINTHIAN KENCHREAI

(PLATES 33-54)

AN important element in the urban complex that was ancient Corinth was the port of Kenchreai, on the Saronic Gulf. Since the summer of 1963 the American School of Classical Studies at Athens, through the agency of the University of Chicago and Indiana University in collaboration, has been conducting investigations of the site each summer. The results have in some respects exceeded expectations, and it will be some time before thorough study of much of the material recovered can be completed. Meanwhile, however, it seems appropriate to present a fairly complete survey of the architectural and related remains, at least, as they have been revealed by the end of the summer of 1966, reserving until a later publication any interpretation of these and the other remains, when there has been opportunity for a general evaluation of the evidence and some further detailed investigation of problematic points.<sup>1</sup>

The results of the investigations in question may be most conveniently described

<sup>1</sup> Brief preliminary accounts have appeared in *Hesperia*, XXXIII, 1964, pp. 134-145; *Archaeology*, XVIII, 1965, pp. 191-200; *Δελτ.*, XIX, 1964 *Χρονικά*, pp. 103-106; *Chicago Today*, III, 1966, pp. 2-9.

The field activity has been under the joint direction of Robert Scranton of the University of Chicago and E. S. Ramage of Indiana University. Other senior members of the staff have been Professors Diether Thimme of Indiana University and John Hawthorne of the University of Chicago. The architect throughout has been Mr. Joseph Shaw, with Mr. George Kachros of Old Corinth as Technician. During the summer of 1963 the staff also included Mrs. Laura Sumner of Mary Washington College; Mrs. Elizabeth Gebhard of Roosevelt University; Miss Leila Ibrahim, Miss Alice Swift and Mr. James Russell of the University of Chicago; Miss Anna McCann and Mr. Robert Hohlfelder, of Indiana University. In the summer of 1964 the staff included Miss Ibrahim, Miss Swift and Mr. Frank Clover of Chicago; Mr. Hohlfelder, Mr. Donald Jackson, Mr. John Wright and Mrs. Wilma Stern of Indiana; Miss Adelaide de Menil of New York as Photographer; Mr. Sam Low, Mr. Nikos Kartelias, Mr. Mike Valtinos, Mr. Demetri Rebikoff, Mr. Ronald Jones and Mr. Charles Berlitz as divers or advisors on underwater problems. In 1965 the staff included Miss Ibrahim; Mrs. Mary Shaw as Artist; Mme. T. Hassia as Photographer; Mr. Ch. Deylakes and Miss Danae Hadjilazarou as Conservators; and, during a brief period, Mr. Harold Plenderleith, Mr. Garry Thompson and Mr. Robert Brill as advisors on technical problems of conservation. Mr. Robert Groves and Mr. A. Comnenos of the firm of Amman and Whitney advised on engineering problems. During the summer of 1966 the regular staff was the same as in 1965, with the addition of Miss Swift and Miss Beverly Adamshek of the University of Chicago, and Mr. Paul Wallace and Miss Kathryn Kroeger (Mrs. Denis Kelley) of Indiana University. Mr. Brill again advised on technical problems of glass. During a brief period special investigations with seismographic instruments were made by Mr. John Huston of the Council for Underwater Archaeology, Mr. Hartley Hoskins (then at the University of Chicago) and Mr. David Greenwalt of Massachusetts Institute of Technology, with brief collaboration of Mr. Harold Edgerton of M. I. T., and Mr. Theodore Hall of Oxford University.

in terms of the several areas of study. These were planned primarily to reveal the arrangements along the waterfront of the harbor, though others were attempted farther from the shore to try to gather other topographical information. In general one should understand that the eastern coast of the Isthmus north of Kenchreai runs fairly consistently north and south, with moderately high ground broaching on the sea in small promontories and bays. At Kenchreai itself the edge of the high ground recedes directly westward for almost a kilometer as the north side of what was once a long bay, the southern shore of which was formed by the foothills of Mt. Oneion (Pl. 33, a). Most of this bay is now filled with alluvial deposits in a broad flat plain, terminating in a long, even, sandy beach extending due south from Kenchreai to the Baths of Helen. The harbor of Kenchreai as it appears to us today is at the foot of this high ground to the north, between the line of the general coast coming down from the north and the alluvial beach extending southward. The base line, so to speak, of the harbor is a stretch of shoreline about 200 m. long extending from the seaward promontory almost due west, curving at the western end to connect with the beach running southward. The eastern, or northeastern, end of the harbor is formed by a ridge of the highland coming down into the sea; the southwestern end is formed by what may have been originally a slight natural promontory later artificially enlarged and extended. The areas of investigation, then (Fig. 1), were at the southwestern end of the harbor (A), the northeastern end (C), the inner corner (B), a point between the inner corner and the northeastern end (E), the crest of the central one of the three ridges that project from the highland southward toward the harbor (G). An abortive attempt was made to examine the easternmost of the three ridges, along the open sea and above the northeastern end of the harbor (D) but this had to be suspended because of the difficulties with the proprietor of the land. A monument discovered in the preliminary general survey of the area, about 500 m. to the north, was examined with more success (T). Some general exploration of the sea bottom was made by divers, but most of the actual submarine investigation was done in connection with the areas as designated above (A and C).

#### AREA A — THE SOUTHWEST END OF THE HARBOR

The first and, as it has turned out, the most important area is the southwestern end of the harbor, marked by a pier from the end of which projected a mole (Fig. 2; Pl. 33, b). On the northeast side of the pier, facing on the harbor, was a series of structures that were probably warehouses; on the seaward end of the pier was a complex, most of which has tentatively been identified as a piscina, or a series of tanks for keeping fish alive; southwest of the warehouses was an intricate complex of which parts, at least, have been tentatively associated with a sanctuary of Isis. Covering parts of the warehouses and sanctuary at the base of the pier are remains of a church with numerous dependencies (Fig. 3).



FIG. 1. Map of the Harbor Area of Kenchreai.

## THE PIER AND THE MOLE

It would seem that the southwestern end of the harbor was defined in nature by a broad triangular point of land extending for a short distance into the bay. At some period the utility of the natural formation was improved by construction straightening and extending the line of the promontory along its northeastern face. The actual shore line in antiquity has not been located with any precision, but it is probable that the artificial extension of the promontory measured ultimately on the harbor face some 90 m., and its masonry facings and pavements may have been carried back along the natural harbor front of the promontory at least 10 and perhaps 60 or 70 m., making a quay along the south side of the harbor between 100 and 150 m. in length. About 30 m. shoreward from the present end of the pier, the harbor face of the artificial construction bends at an angle to continue more nearly eastward, as the face of a mole some 15 m. wide at the top, extending about 85 m. along its northern face seaward from the bend and 70 m. on its southern face from the point of its departure from the end of the pier.

The structure of the body of the pier and mole is simply a mass of earth and broken stone, such as one sees in embankments carrying highways or railroads across low ground. The depth of this fill varies according to the level of the original terrain: at the shore end it grades to essentially nothing over earlier deposits, but at the outer end of the mole it rises now some 25 m. above the harbor bottom, where the total depth of the water is about 30 m. It is difficult to determine accurately the character of the stone aggregate in the mass; corroded and congealed by the sea water, and covered by shells and seaweed, the chunks of stone often give the appearance of masses of concrete, and there may indeed be random masses of concrete included. However, it would appear that for the most part the constituents are simply pieces of rock broken from the stratum of limestone and conglomerate which caps the hills overlooking the harbor from the north.

The harbor edge of the top of the pier and mole is lined by a narrow wall (Figs. 1, 2, 4). This is preserved almost continuously from a point about halfway along the mole to a point about 20 m. out from the present shoreline, a distance of about 120 m. Whether it continued farther northwestward, toward the interior of the harbor, has not been established. It is possible that the southwest side of the pier was lined with a similar wall, but the evidence here is confused, and what might seem to be edging of the pier structure on this side may perhaps be associated with construction on top of the pier. The wall on the harbor face is preserved for the most part in a single course of squared blocks of random size ranging from 0.40-0.70 m. in width, 1.00-1.50 m. in length, and around 0.40 m. in thickness. Occasionally a second course is preserved. The top of the second course, with variations, lies about MSL<sup>2</sup> —1.75 to

<sup>2</sup> "MSL" is the official *modern* sea level. The sea level in ancient times (the Augustan period) was certainly lower, by perhaps as much as two meters. More accurately, the land now



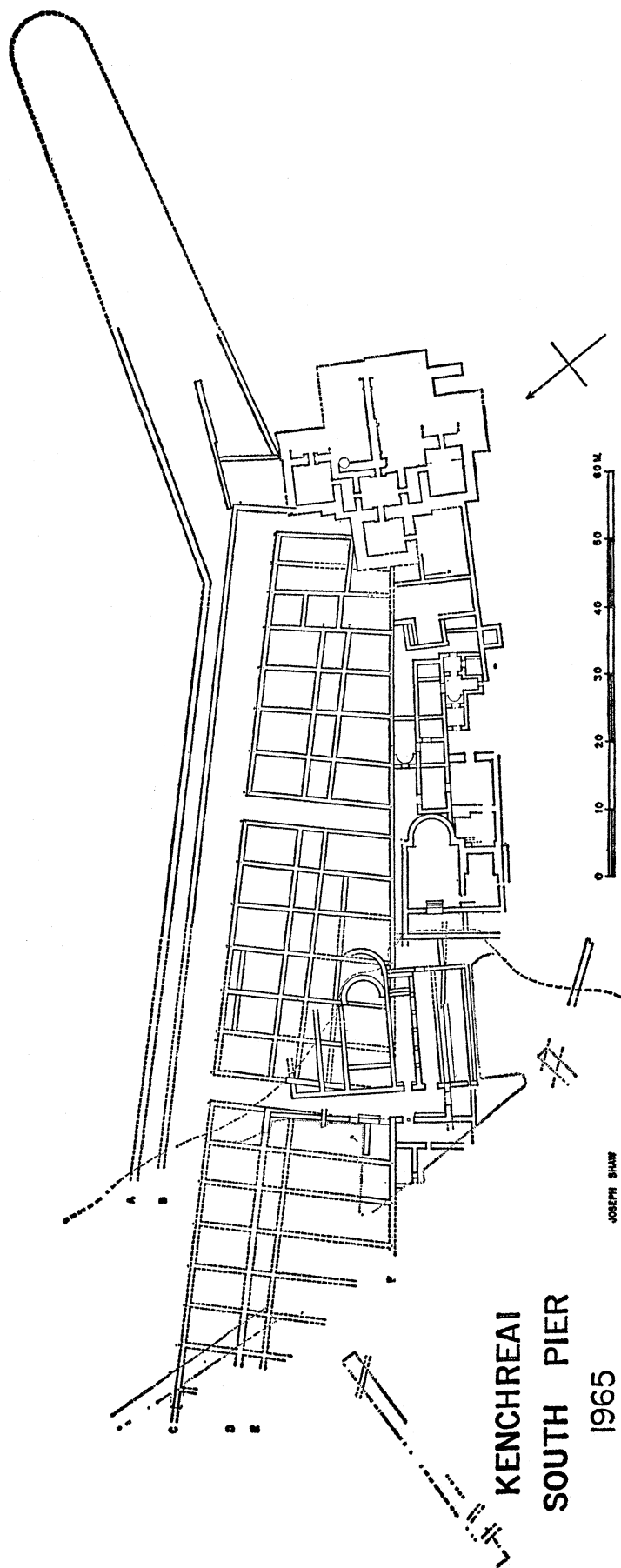


FIG. 2. Area A, the Southwest End of the Harbor, Sketch Plan of the Quay, Mole and Related Structures.

—2.00 m. Behind this wall are paved areas at approximately the level of the top of the second course.

Along the harbor face of the pier there extends a second wall with its face about 3.00 m. behind the face of the outer wall (Figs. 1, 2, 4). No traces of this second wall have been found farther to the northwest than about 20 m. from the modern shore line, but from this point it continues about 80 m. seaward, then makes a right angle southward, a line that may designate the end of the pier proper. This inner wall is built of squared blocks like the outer wall, and it, too, is nowhere preserved more than two courses high. Its top is a little higher than the outer wall, about MSL —1.50 meters. In construction it is a little more careful; in the second course, two blocks of headers alternate with two blocks of stretchers.

The pavement between these walls is of random stones, fairly flat on top but not accurately fitted nor uniformly shaped (Pl. 34, a). It made a firm but somewhat uneven, heavily cobbled surface. It has been observed in a number of places, but in many it is either missing or covered by sea-shifted stones and gravel and by marine growths.

From the end of the pier a line of blocks extends, apparently aimlessly, along the middle of the top of the mole.

The seaward end of the pier is a mass of masonry which is difficult to study, lying at MSL —1.50 to —2.00 m., covered by stones and gravel. Various attempts were made to examine it by a kind of photogrammetric survey which at the particular depth proved to be impossibly expensive, by direct measurement by divers, and by excavation of several pits or trenches. The results show that much of the surface of the end of the pier is covered by massive pavements with an irregular outline of projections and recesses. Much of this belongs to an arrangement which will be described below as the "piscina," and with some exceptions it is not possible to ascertain whether the entire construction represents a single plan or a number of accretions and remodelings. In any case the outline, though irregular, resembles in kind the plan of many a modern harbor with recesses for docking small boats, projections to reach larger ones, and various other special adaptations. The masonry is generally similar to that of the walls on the north face of the pier and, though when viewed in plan it seems to represent a much more massive construction, where examined in trenches it appeared to be nowhere more than three courses in depth.

In a trench dug at the south corner of the pier from a depth of about two meters below sea level to about three meters below sea level, there were found the ends of two blocks of two courses of what may be the southwest facing of the pier at this point. Lying across the line of this wall were remains of a boat: four ribs, of which

lies lower by that much. But there are many anomalies in the level of the ancient remains relative to sea level, that still present baffling problems. No effort will be made in this report to account for these, pending further investigation.

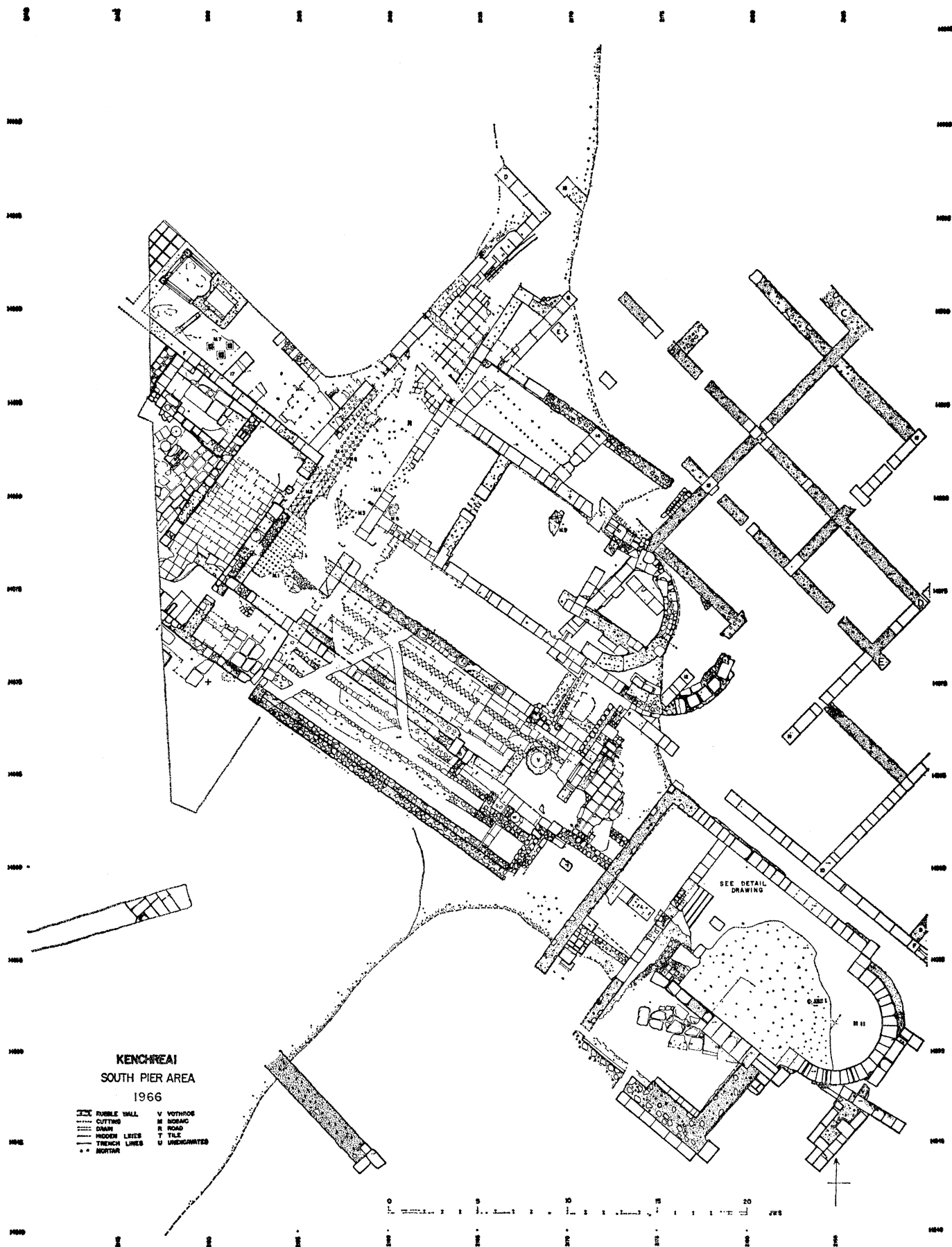
three were still linked by planking. No effort was made to examine this vessel in itself, but the construction as partially revealed, including several nails, has some interest (Pl. 34, b). It is further of interest that the vessel does lie across the line of the wall, indicating either that the wall had been partially removed before the boat was abandoned or that there had been a small slip at this point in which the boat was left. In the fill, close to the bottom of the wall, was found a coin of Antoninus Pius.

Another trench was dug about 10 m. shoreward from the spring of the mole, across the facing walls of the pier on the harbor side and extending northeastward down the slope of the mole into the bottom of the harbor itself. Since it quickly developed that the area between the two walls was roughly paved, no penetration to depth was made at this point, but northeast of the outer wall a pit some 2.00 m. wide and 5.00 m. long at the top was excavated to a depth of about 0.50 m., that is, from about MSL —2.25 m. to MSL —2.75 m. This soon revealed the bottom of the lower course of the outer wall at MSL —2.75 m., and produced some Roman pottery and three badly corroded coins, of which one may belong to the second century after Christ. In the hope that more significant results might be achieved more quickly, this part of the trench was abandoned and efforts were concentrated on a pit about 12 m. northeastward, at a point beyond the mass of fill constituting the pier, in what appeared to be the actual harbor bottom. Beginning at MSL —3.75 m. a pit about 2.00 m. wide and 4.00 m. long was excavated to a depth of MSL —4.90 m. It was hoped to find an undisturbed natural accumulation in the harbor bottom with a considerable chronological range, but the entire mass excavated proved to be a homogeneous deposit of Roman pottery and glass, coarse and fine (Pl. 34, c).

### THE WAREHOUSES

Facing on the quay stretching along the northeast side of the pier was a series of structures which may most probably be understood as warehouses. Remains of three units of these have been identified. Those of the southeasternmost are visible, in their entirety, submerged in the sea (Figs. 1-2); those of the northwesternmost, lying in their entirety on land, have been partially exposed by the excavations (Figs. 1-3); those of the central unit have in part long been visible along the shore or submerged in the sea (Figs. 1-3; Pl. 33, b), in part were covered by earth and have been revealed by excavation. All three units appear to have had a common wall bounding and connecting them along the southwest; northeast of this each unit consisted of ranks and files of quadrangular rooms designed with relation to the front, northeast wall, which was not parallel to the southwest wall, so that while the southeastern end of the southeastern unit is barely 17 m. wide, the northwestern end of the central unit is about 26.50 m. wide. It would seem likely, at least, that the southwestern wall was penetrated by doors in the spaces between the several units.

The southeastern unit, which lies entirely on the pier and is now completely under



water in the sea, is preserved only in the foundations, most of which are rubble set in hard mortar though the outer walls were in large part at least built of squared blocks. The level of the top of the preserved course in the southwest wall is around MSL  $-0.80$  m.; that of the top of the preserved uppermost course in the northeast wall is around MSL  $-1.30$  m. or about  $0.20$  m. above the top of the inner wall of the quay to the northeast. Presumably the floor of the structure was no lower than the top of preserved sections of the front wall, and it is perhaps unlikely that it was more than seventy or eighty centimeters higher than this. The entire unit measures some  $39.50$  m. in length along the front. The northwestern portion is divided into four files, or sets, of three rooms each, measuring about  $5.50$  m. wide at the front, each set consisting of a front room about  $7.00$  m. deep, a central room about  $3.00$  m. deep, and a rear room whose width varies as the southwestern wall diverges from parallel with the front. The southeastern part of the building follows essentially the same plan, with variations resulting either from the more constricted depth of the structure at this end, or from later remodeling.

The central unit exhibits the same general plan, with the exception that as the depth of the building increases toward the northwest, an extra longitudinal partition creates a fourth room in each set excepting the southeasternmost. The details of construction, however, are more abundantly preserved. The parts of the structure which lie now in the sea are foundations built almost entirely of rubble in hard mortar, but the parts preserved on land are built, including the foundations, of heavy ashlar blocks, resting on compacted earth and set in footing trenches cut into earlier stratified accumulation. The ground level for the building is indicated in several places by the neater trim of the top of the foundation blocks and by differential weathering on the succeeding course, giving an approximate floor level for the southwestern ranks of rooms, at least, of about MSL  $+0.80$  m. It may be noted in passing that this is, in the existing state of things, from  $1.30$  m. to  $2.00$  m. higher than the figure suggested for the floor level of the southeastern unit.

The masonry of the first course above the foundation in the central unit is remarkably fine (Pl. 35, a). The blocks are fairly uniformly about  $0.60$  m. wide,  $1.00$ - $1.60$  m. long, and  $0.45$ - $0.80$  m. high. One face of each block, apparently, was neatly beveled on all four edges. It is probable, however, that these blocks were re-used from some previous structure, since the bevelling occurs on one side only, whereas the blocks in their present position as enclosing and partitioning walls of the warehouse would have been visible on both sides.

The remains of the northwestern unit of the warehouses now lie entirely on dry land, but only part of the southeast wall and the southern corner of the building have been cleared. Trenches dug farther west, trying to locate the northwestern end of the structure, gave ambiguous results. A section of what might have been the back wall of the front room of the sixth set and a section of what might have been the

front room of the seventh set (one more than in the other two units) were found; but a trench plotted to locate the west corner, along the line of the prevailing rear wall of the other buildings, revealed nothing at a depth of close to sea level, when ground water made further penetration impracticable.

On the other hand, what has been found at the southeast end and south corner has particular interest. At this end the southwest wall continues the line of the southwest wall of the other two units at least behind the first three sets of rooms. The first course above the foundations is preserved continuously here, and shows door cuttings about 1.50 m. wide, with the bottoms about 0.22 m. above the top of the foundation course. From these door cuttings and weathering on the wall blocks the floor level may be calculated as at about MSL  $\pm 0.90$  m.

The east corner of the unit is not preserved, though the southeast wall of the corner room projects far enough northeastward to suggest that there had been originally a front wall continuing the line of the front walls of the other two units. The southeast wall itself shows clearly two periods. The lowest course is constructed in a style and on a plan wholly consonant with the general scheme suggested by the central and southeastern units; the upper part of the wall has been re-set with a slightly different orientation, bearing four or five degrees closer to north (Figs. 2, 3). This later construction is solid and neat, using many unspoiled blocks from the earlier wall, but with frequent gaps between the large blocks filled with rubble laid in hard mortar, or occasionally with neatly trimmed brick-like stones (Pl. 35, b).

The first partition wall from the rear was refashioned in similar style at the same time, with a door about 1.25 m. from the southeast wall, and it may be that it was at this period also that the doors in the rear wall were blocked with mortared stones. The partition wall between the rear rooms of the first and second sets has been cut presumably to form a wide door or passage, and the partition between the rear rooms of the second and third sets has been removed entirely. The area of the corner room has been paved with marble slabs; that of the second room with a fine mosaic (Pl. 35, c); that of the third with tiles some 0.55 m. square. The wall of the second room has been plastered and decorated with fresco; the plaster continues smoothly around the jamb of the door connecting with the corner room. There are still other modifications in this area, which clearly belong to the arrangements of a distinctly different period and to functions wholly unrelated to the warehouse, that will be described below, but it is less certain how many of the adaptations listed above should be related to the period and functions of the warehouse and how many to subsequent periods and functions. It may, however, be noted that the marble and mosaic floors are at the same level, MSL  $\pm 0.90$  m., indicated by other considerations for the original floor, though the marble floor is oriented in relation to the revised line of the southeast wall.

Behind the central unit of the warehouses were discovered clear traces of a wheel-

traveled road. Hard packed sand and gravel, with distinct wheel ruts, could be followed for several meters. Behind the sixth set of rooms the top of the road deposit lies at about MSL  $+0.90$  m. corresponding to the ground level calculated for the southeastern end of the northwestern unit, but fifteen meters to the southeast, behind the third set of rooms, it has apparently dropped to MSL  $+0.35$  m. (The road surface itself has not been exposed at this point, but the weathering on the wall of the warehouse would suggest as much.) The road followed closely the rear wall of the warehouse, and was at least 2.50 m. wide.

Along a line about 5.00 m. southwest of the southwest wall of the warehouse, there have been noticed, at several points in modern intrusive cuttings and in exploratory pits through the floors of the later church, remains of stone foundation-packing which conceivably represent a continuous wall, extending at least between grid points 2155/14575 and 2172/14561.

About 2.00 m. farther southwest of this, on a line from grid points 2164.5/14565.75 to 2175/14557.5, are extensive remains of masonry representing, apparently, another continuous wall approximately parallel to the southwest wall of the warehouse. These lie for the most part below various later walls, and below the level of ground water, and so far it has not been possible to examine the remains closely. The sections uncovered, however, consist of a single course of well-cut poros blocks about 0.65 m. wide, of random length and undetermined height, their external face apparently toward northeast. At least two walls at not quite right angles to this, extending southwestward, were partially revealed: the most southeasterly, from grid point 2173/14559; the other, from grid point 2167/14563.5. The first of these may be traced some 5.25 m. to the southwest, and is perhaps the southeast end of the building. The line of the northeast (front?) wall of the structure is continued beyond the east corner by two heavy blocks of ashlar limestone, like the blocks in the other walls of the building, except that most of the top surface is much worn and pitted, as might have resulted if the block had been the sill of a gate. Moreover, southwest of the south corner of the building there is a heavy block of ashlar limestone which was never fully exposed, because although the earth could be removed from over it, sea water seeped in in greater volume than could be overcome by the available pumps. From feeling the surface of the block beneath the water, however, it seemed that this surface too was unevenly worn, and that there was a round socket of some sort on it, suggesting a gate at this corner also. In one face of each of the preserved cross walls there is a circular cutting; the northwesternmost of these has been completed into the area of the space adjoining by an edging of masonry to form the mouth of what appears to be a well. This has been examined to a depth of about 1.50 m. without producing any finds or reaching a bottom.

About 0.15 m. below the tops of the blocks of the walls described above, on the presumed interior of the building, is a stratum of clay with scattered stones and

some lime imbedded in it. This may represent the floor level, which would then lie at about MSL —0.40 m. (about 1.20 m. lower than the level of the highest surface of the road southwest of the warehouse). This stratum and the remains of the walls just described were covered with some 0.50 m. of clay, in which were imbedded many bits of charcoal.

Farther to the northwest, in grid squares 2145-55/14570-75, were found a number of blocks of random size arranged in such a way as to suggest a rough pavement. There is no evident plan to them, nor has any really reasonable explanation presented itself for them. There does seem to be, however, a wall extending from this construction to one of the remnants of foundation-packing associated above with the line 5.00 m. southwest of the warehouse, and it is not impossible that these remains all belong with a single general complex southwest of the road, on the southwest side of the pier and promontory.

About 5.00 m. southeast of the presumed southeast end of this complex or structure, below the later "temple" in this region, there are remains of a structure with a markedly different orientation (Figs. 3, 5) very nearly east-west (or north-south). There have been revealed only a few large blocks, crudely shaped and loosely fitted, constituting a part of the south wall, and a few more behind these. The south wall is indicated clearly by the areas on the top surfaces of the stone which have been dressed down to a fairly smooth and even surface, leaving rougher areas outside a general line defining the edge of the superstructure. The blocks of this part of the foundation were held together by swallowtail clamps of which the cuttings for several are clearly visible, and in one set of cuttings there was still lying a shrunken piece of wood which may have been the original clamp. The blocks behind (north of) this wall are even more crudely shaped and loosely fitted; on some of them the highest projections have been trimmed down roughly, and on two, lying side by side just east of the westernmost, a roughly tooled notch runs across the eastern ends. It is possible that some of these were boulders imbedded in the ground when the building was erected, and used, without being moved, in the foundations, with a minimum of tooling.

These remains have been described at this point because they seem to be the earliest structures in this part of the area. A coin found close below the floor of the complex southwest of the road can be dated to 17 B.C., and the building may have been built during the reign of Augustus. With available evidence, however, it is impossible to be certain about their date or actual relationship to the warehouses, excepting perhaps to say that they are in all probability at least no later than the warehouses. As to the date of the latter, even here the evidence is insufficient, and in any case has not been fully evaluated. It might, perhaps, be appropriate nevertheless to make the following observations. Those parts of the warehouse which are built on the massif of the pier itself must, of course, be no earlier than the pier. All tests made of the fill of the pier have produced coins, lamps and pottery of the second century after



Christ. These tests have not penetrated really deeply into the mass of fill, and there may have been an earlier period for the pier, the substance of which was covered at a later date; indeed, there may be considerable question as to how deeply the surface of the pier may have been disturbed by wave action through the centuries. On the other hand, in the datable material recovered from stratified deposits in connection with the warehouses where they are preserved on land (under floors and in footing trenches) nothing has so far been identified later than the first half of the first century after Christ.

### THE "PISCINA"

The southeastern end of the pier was adapted at some period after the construction of the warehouses in a peculiar fashion involving a number of channels connecting what seems to be a series of tanks. The arrangements are far from clear; the remains lie at a depth of around MSL—1.50 m. and are much obscured by erosion, solution, seaweed and accumulated beach material. Moreover, the construction is essentially in the nature of a continuous pavement, without walls in the ordinary sense; the tanks are simply sunken areas formed by gaps in the pavement, which become confused with the obscured or accidentally destroyed sections of the pavement.

In general, however, one may perceive the plan of the arrangements (Fig. 4). At the seaward end of the pier as it is now preserved, about 12 m. from the southwestern face of the pier, there is a sunken channel running parallel to the southwestern edge along a line marking approximately the axis of the pier. The channel as preserved and indicated on the plan begins about three meters from the present end of the pier and from thence for about 6.00 m. it is about 0.90 m. wide; thence northwestward it is about 1.20 m. wide. This may perhaps be explained by supposing that the original part of the channel is the wider section to the northwest; during a later extension of the pier the channel was carried to the new edge in a narrower bore; later the pier was extended still another three meters, without accommodating the channel to the new edge. In any case the channel continuing northwestward encounters a gap some 1.20 m. wide, and is resumed in a short stretch 1.20 m. long and 0.65 m. wide leading into a large rectangular basin. In the walls of the "original" channel are two sets of slots on the opposite walls, 0.10-0.20 m. deep and 0.15-0.30 m. wide; in the southeastward "extension" there is a similar pair; in the "door" to the basin there are two more. The basin itself is about 6.60 m. by 4.80 m. in dimension; directly opposite the "door" from the main channel is a similar door, and there is another similar door on each of the side walls. Each of the side doors leads to a basin about 1.80 m. by 5.00 m.; in the northeast and southwest walls respectively of these, a door leads to another basin approximately though not exactly 6.00 m. square; from the southeastern wall of each of these, in turn, a similar door leads to still another basin of uncertain dimension. The southwestern of the penultimate basins has been



reduced in size by added masonry along the southeast side. Finally, returning to the central basin, the door in the middle of the northwest wall of this (Pl. 36, a) leads to a basin about 5.00 m. by 6.00 m., and from the southwest wall of this a door and a channel lead to the southwest side of the pier.

All of the doors have two pairs of slots like those in the main channel excepting the last mentioned, which has only one pair. In some of these doors large tiles or slabs of marble were found still fitted, like portcullis gates; in one there was found a wooden plank.

As has been indicated, the masonry forming this structure is an expanse of squared blocks of miscellaneous size with a fairly uniform top surface around MSL —1.30 to —1.40 m. A pit dug in the corner of the central basin revealed a second and third course of stone below the paving course; the second projected inward from the one above by about 0.70 m., and the third, whose top lay about 0.80 m. below the surface of the pavement, projected more than a meter inward from the line of the second, so constricting the available space within the room as to suggest that its top represents the floor, or bottom, of the basin (Pl. 36, b, c). In the northeastern room, where the level of the pavement seems to be lower than elsewhere (MSL —1.60 m.) there was a second course whose top lay about 0.33 m. below the surface of the pavement, but no third course (Pl. 36, d); however, indications of a "bottom" were noticed about 1.10 m. below the surface of the pavement.

Evidence for the date of these structures is again slight and still not fully evaluated. Most of the excavated material came from within the basins, and hence presumably dates from after their period of use. Such material as was found associated with the lower courses, so far as it has been studied, resembles that found elsewhere in the massif of the pier, and may indeed be simply part of that. There is, however, clear indication that parts at least of the "piscina" are later than the warehouse, since the south corner of the warehouse was demolished to make room for some of the basins.

## THE SANCTUARY

Northwest of the "piscina" and southwest of the warehouses extended a complex of structures of considerable interest which has not yet been, and perhaps never can be, fully studied. We may review the remains so far as they are now known in three sections: that to the southeast, almost completely submerged in the sea; the central section, generally submerged, but in such a way that it has been excavated to a considerable extent; and the northwestern section, almost entirely on land, and even extending into the area of the warehouse itself (Figs. 2, 3).

The southeastern submerged section, immediately northwest of the "piscina," is about 20 by 15 m. in area, consisting of a series of rectangular rooms in two of which small apsidal ends have been added. The rectilinear walls are constructed largely of stones in hard mortar; the apses are made of baked brick. There are considerable

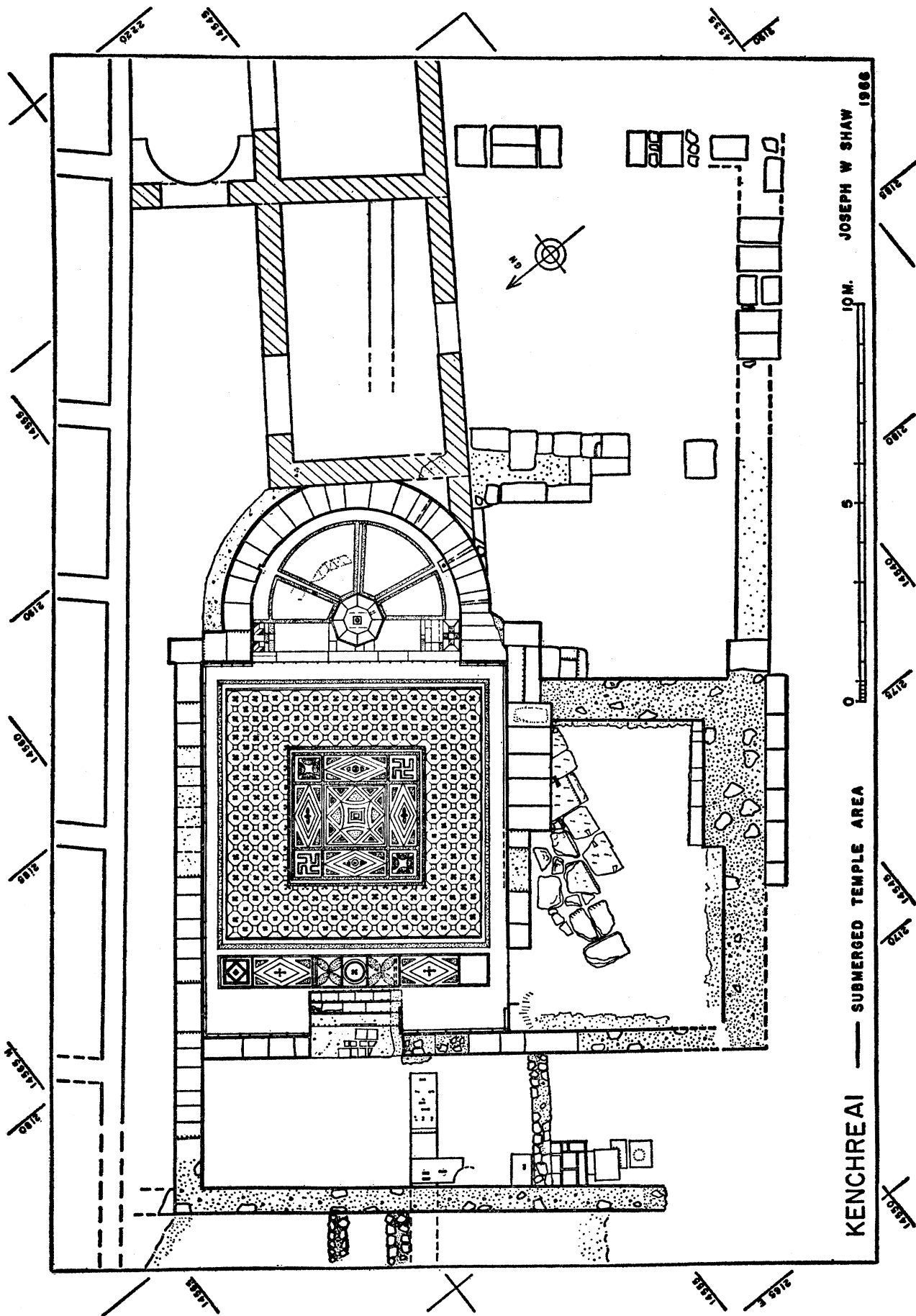


FIG. 5. South Pier, Detailed Plan of Submerged Apsidal Structure and "Temple."

remains of floors of square tile or cement. Under the existing conditions (the state of preservation and the inconvenient depth of water, about one meter) it is almost impossible to examine these with any satisfaction.

The central section, also about 20 m. by 15 m. in extent, consists of three clearly defined parts evidently constructed as a unit. On the northeast is a large rectangular space with an apse on the southeast end; on the southwest is a temple-like structure with a forecourt to the southeast; across the northwestern end of both runs a long hall.

The apsidal unit (Fig. 5; Pls. 37, 38) consists of a rectangular space about 7.70 m. wide and 9.90 m. long; the apse is 5.20 m. wide and slightly more than a semicircle, so that its center lies about 1.40 m. within the line separating it from the rectangular area. The walls are built of well cut blocks of poros, 0.60 m. or more thick, some of them taken from earlier buildings. For the most part they are preserved to a height of two courses, or about 1.20 m. above the floor. The joints are neat and close, but tightened with cement. Around the base on the inside of the rectangular room is preserved a dado made of slabs of marble in varying colors, in random lengths. The slabs are cut from slabs previously used for other purposes, and some still have the mouldings of the previous use; one slab, at the northwestern end, bears letters of an inscription cut in broad, shallow lines: ΣΤΡΑΤΗ. There is no trace left on the walls above this dado of whatever decoration the upper part of the walls may have had, though pieces of marble and red porphyry cut in circles, squares, triangles and other geometrical shapes found on the floor may have adorned it in some period.

The floor itself lies at MSL —0.75 m. It consists of a well preserved mosaic with two dark bands forming a border and a large panel 7.20 m. square divided into smaller panels with formal devices in each. A separate band of panels extends along the northwestern end of the room outside the central square and the outer border.

The apse stands about 0.15 m. higher than the rectangular space; it is paved along the front with marble slabs—at each end there is a panel of pieces of various colors cut in various geometrical shapes—but the main part of the semicircle is paved with a mosaic of large marble chips, mostly white but with darker lines radiating from the center and outlining the curved edge. In the center is an octagonal basin 0.27 m. deep, lined with white marble. The floor is covered with similar slabs, on which are engraved radial lines. In the center is a lead pipe, broken at floor level; in the basin, lying tilted against the side but in all probability approximately *in situ*, was a marble pedestal about 0.90 m. high with a square base but round shaft and top, hollow in the middle. It is decorated on the outside with a simple pattern of leaves and may have held a large bowl, with water spouting from its center delivered by the lead pipe.

The lead pipe came in under the floor from the east, where a rectangular cutting in the side of the wall leads down through the floor. In a hole cut, probably, by ancient repairmen, the end of the pipe beneath the floor could be felt.

Next to the floor of the octagonal basin, on the south side, is a hole which might have served for drainage; at the end of a radius drawn through this hole, against the south wall of the apse itself, there is a small marble slab in the floor of the apse with a round hole cut through it, which was presumably a drain for the floor of the apse itself, and may join with the drain from the basin.

It is difficult, if not impossible, to determine the original relative levels of various parts of the floor. Not only is the floor uneven, having buckled and sagged somewhat in places, but the entire building has evidently tilted down toward the south, either as the result of settling on insecure foundations or from the effects of seismic disturbance. In any case, the floor does have a pronounced general tilt to the south, and the walls are cracked in a number of places.

The structure was entered from the middle of the northwest end by a flight of four stairs leading down into the room. The steps are constructed of a mass of rubble and concrete, and are lined with thin slabs of marble.

At the northwest end of the southwest wall a door leads to the southwest. In it a wooden sill is still partially visible. The opening has not yet been cleared, because of difficulties in controlling the water in the two rooms simultaneously.

For reasons which cannot be discussed in this report there is some doubt as to whether the apsidal structure we have been surveying ever had high walls and a roof. Few roof tiles were found in the debris filling it, and there are other difficulties. It is premature to press the hypothesis that the space was actually open to the sky, but it should be kept in mind.

In a secondary period the room was filled to a depth of about one meter. This fill contained a vast amount of extraordinary materials which cannot yet be described in detail, because of the time required for conservation. In general it may be said that along the walls were nine stacks of crates (Fig. 6; Pls. 38, b, 39, a) of panels of opus sectile made in thin opaque glass. The panels were made of mud plaster on a core of large coarse potsherds; some of the panels are about 1.90 m. by 1.05 m.; others, about 1.35 m. in length, the width not yet definitely established. The glass was cut into shapes in the manner of the glass in a stained glass window, and affixed to the surface of the plaster panel. The panels were then packed in wooden crates, each crate containing two panels face to face. The crates were then leaned against the wall and each other, from four to eight crates or more in each stack. The designs on some of the panels were formal; on others, pictorial. Among the latter were compositions in the Egyptian manner, in horizontal bands. On some of these were depicted lotus, papyrus, and other flowers, ibis and other aquatic birds (Fig. 7; Pls. 39, d,<sup>3</sup> 40, a, 41, a); crocodiles (Pl. 39, c) and other animals; and occasionally a human figure (Fig. 7), most of these having Nilotic character. On others were depicted architectural themes, build-

<sup>3</sup> Cf. *Archaeology*, XVIII, 1965, p. 198, underwater photo in color. More details and pictures will be found in *Archaeology*, XX, 1967, no. 3.



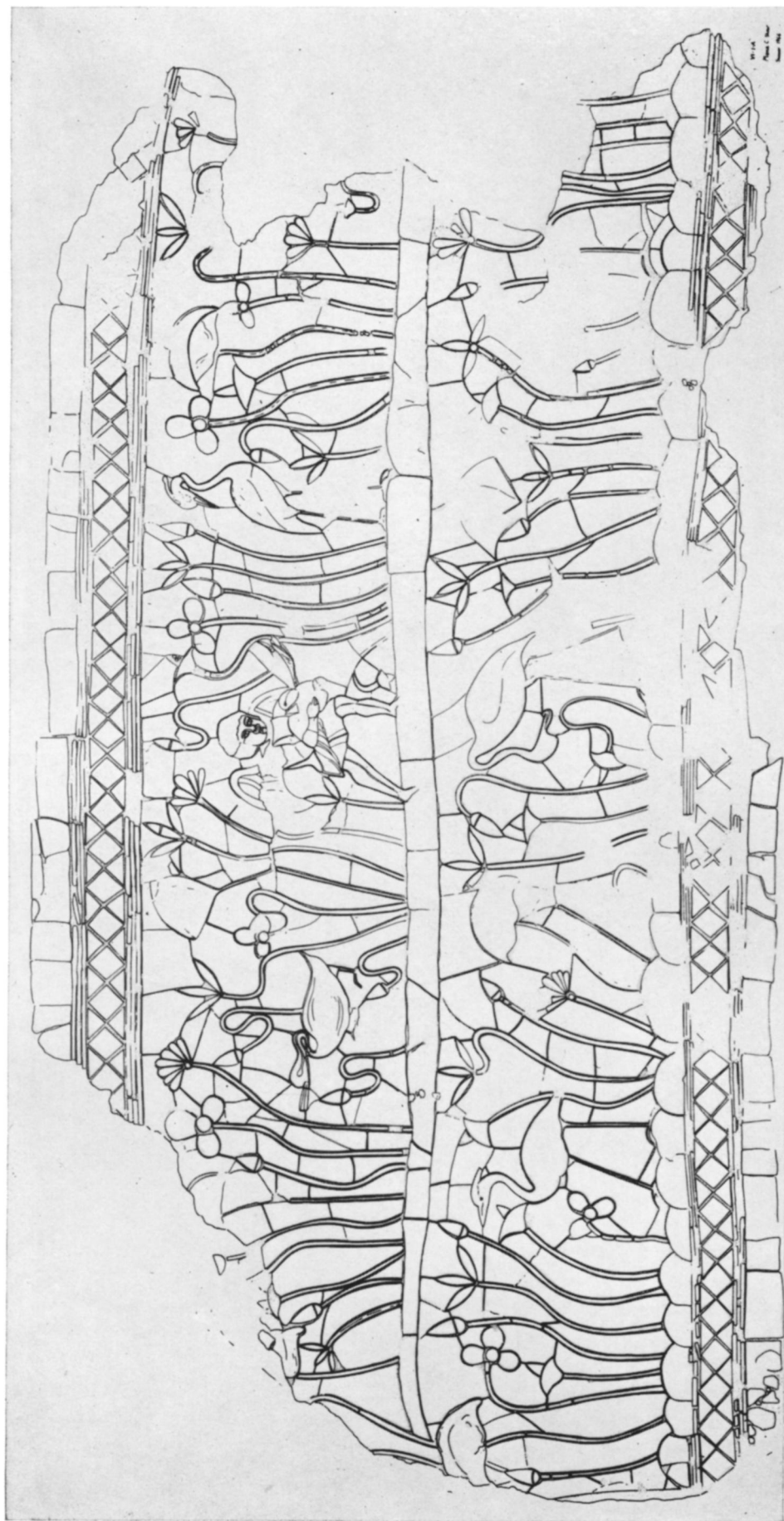


FIG. 7. Panel of Opus Sectile from Stack V, Depicting Winged (?) Man in Swamp with Birds.



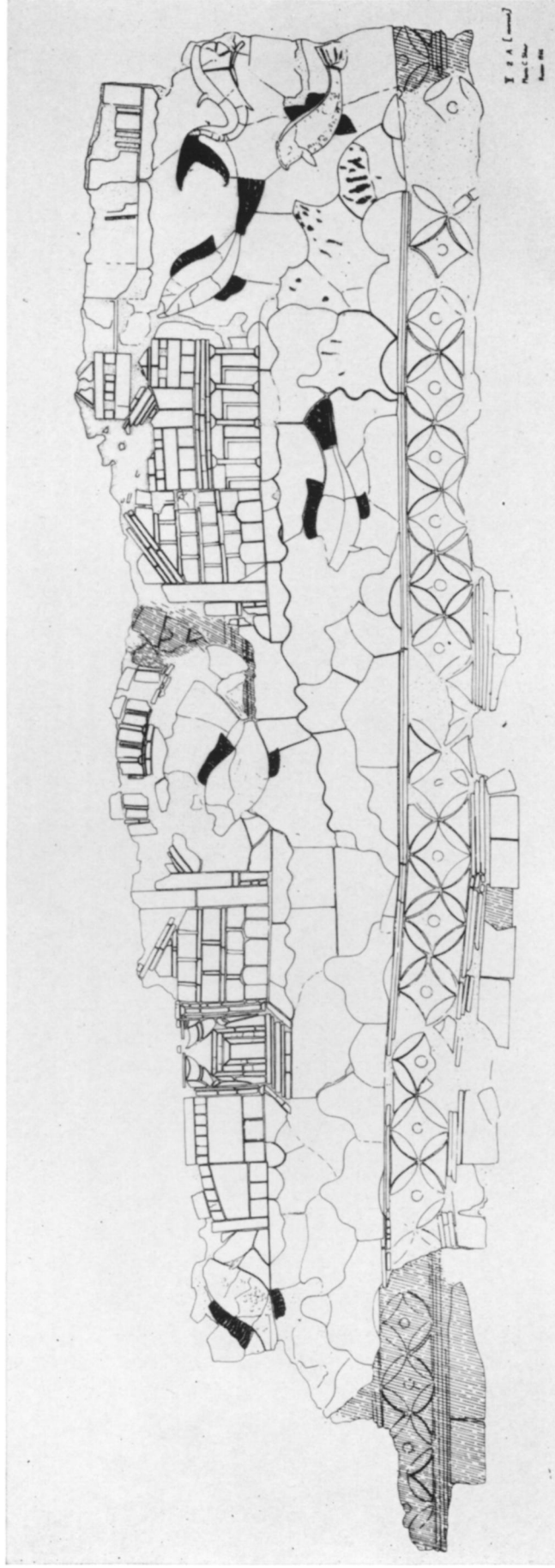


FIG. 8. Panel of Opus Sectile from Stack V, Depicting Fish in Water before Buildings.



FIG. 9. Panel of Opus Sectile from Stack VI, Depicting Homer.

ings along a coast, and fishermen casting their nets or lines for fish (Fig. 8; Pls. 39, b, 40, b).

One panel presents a full-length depiction of a man, about 1.10 m. in height, standing on a pedestal, the whole surrounded by a delicate formal floral border (Fig. 9; Pls. 41, b, 42, 43). On either side of the man's head are worked the letters OMH and POC. Although the H is formed with the vertical bars slanting so that they might conceivably represent the letter A, it is hard to doubt that the letters indicate that the picture is intended as a portrayal of Homer. A closely similar figure is labelled [---][TΩ].

Only a few of these panels have been cleaned at this time, but six of the stacks have been removed and the panels are in the process of being cleaned. Three stacks were left in the room after the season of 1966 in the hope that better methods of conservation might be discovered.

Also in the room, scattered over the floor and particularly just in front of the apse, were quantities of pieces of wooden furniture, much of it covered with a thin veneer of ivory or tortoise shell, decorated with incised patterns (Pl. 44, a, b). Other fragments of similarly incised material were found loose, as were many bits of carved ivory including two plaques depicting seated men (Pl. 44, c, d). No detailed account of these can be given yet, pending further cleaning, preserving, and study.

The debris in which this material was found, filling the space, contained also fragments of lamps of the early fifth century after Christ. On top of the fill was a hard, thick stratum almost like cement. How much of the hardness of this layer results from chemical action in the sea water since the final abandonment of the building is uncertain, but it does seem clear that the stratum represents essentially the floor of a second period of the building (Pl. 37, a). In the west corner there were remains of tiling at this level, and of a well-built, tile-lined drain that would have been just below the new floor.

Returning to the original period of the structure, we may examine the section lying southwest of the apsidal unit, tentatively identified as a "temple" (Figs. 3, 5, 6). The northeast wall of the "temple" and the southwest wall of the apsidal unit are identical; the northwest wall is structurally a continuation of the northwest wall of the apsidal unit, though built largely of rubble concrete rather than ashlar blocks; the southwestern and southeastern walls are also built essentially of rubble concrete, in a single mass. The concrete foundations have been badly cracked, and a large section of the northwestern part of the southwest wall has broken completely away and tilted outward to the south. The concrete walls are faced with a moderately smooth but imperfect surfacing of coarse plaster, on which appear trowel marks sometimes suggesting the shapes of irregular stones, sometimes the shape of fish.

The design of the northeast and southwest walls is noteworthy. The southeastern portion of each is thicker than the northwestern. The northeast wall is made

of poros blocks set crosswise, making a wall about 1.20 m. thick; the concrete foundation of the southwest wall corresponds approximately to this, though a little thicker. The northwestern part of both walls, however, is thinner by some 0.60 m. or more. The structure thus gives the appearance of two rooms, the southeastern smaller than the northwestern, but so far there is no indication of a cross wall.

In any case it is clear that the walls we have been describing are the foundations for a superstructure, and the walls of a basement below the superstructure. In the excavation of the basement room, below a depth of MSL  $-0.60$  m. there were found (Fig. 6; Pl. 45, a) two large wooden timbers about 0.25 m. thick, a number of wooden boards, two wooden doors (Fig. 10; Pl. 45, b), and a number of thin, narrow, lath-like pieces of wood. Some of these were apparently parts of a curious construction consisting of two side pieces with the thin bits fastened between them in a kind of woven scheme—one end of the lath fastened to the front of one board, the other end to the back of the other board; the next lath attached to the side boards in a similar way but reversed, and so on in alternation (Fig. 11; Pl. 45, c). The "woven" panel thus formed may have been filled with clay or plaster, and with a surface of hard, thin, smooth stucco. Several other boards with remains of a similar stucco surfacing were found.

Mingled with the wood, or under it, were quantities of marble slabs, including some pieces of broken marble bearing saw grooves suggesting that they are the remains of larger pieces of marble from which slabs had been sawn. There were also four blocks of stone shaped roughly like loaves, with the bottom surface rubbed smooth and with horizontal holes through the tops: these presumably were used to polish marble slabs or mosaic floor. There were also masses of mosaic tesserae which had never been set, and blocks of stone from which such tesserae might have been cut.

Beneath this was a stratum of sand and gravel with a heavy component of red and white finely porphyritic basalt crushed to lumps of about an inch in diameter; similar material was used extensively as the grit in the mortar of the apsidal complex and several other structures in the vicinity.

That there was a higher floor is indicated in the southeast wall. The top of this foundation is now at about modern sea level; on the foundation there is preserved at the northeast end a poros block, cut roughly so as to suggest two steps. This may reasonably be understood as part of the support for actual steps, which would have extended all across the southeastern front. Such steps would lead to a floor level about 0.90 m. above modern sea level, or a few centimeters more. Thus the main floor of the south unit was about 1.75 m. higher than the mosaic floor of the apsidal unit and about the same above the floor of the basement below.

The ground level in front of the southern unit, to the southeast, is suggested approximately by the lowest step, or approximately at modern sea level. A similar level is indicated by the sill of the gate of the forecourt for the structure, about 5.00 m.

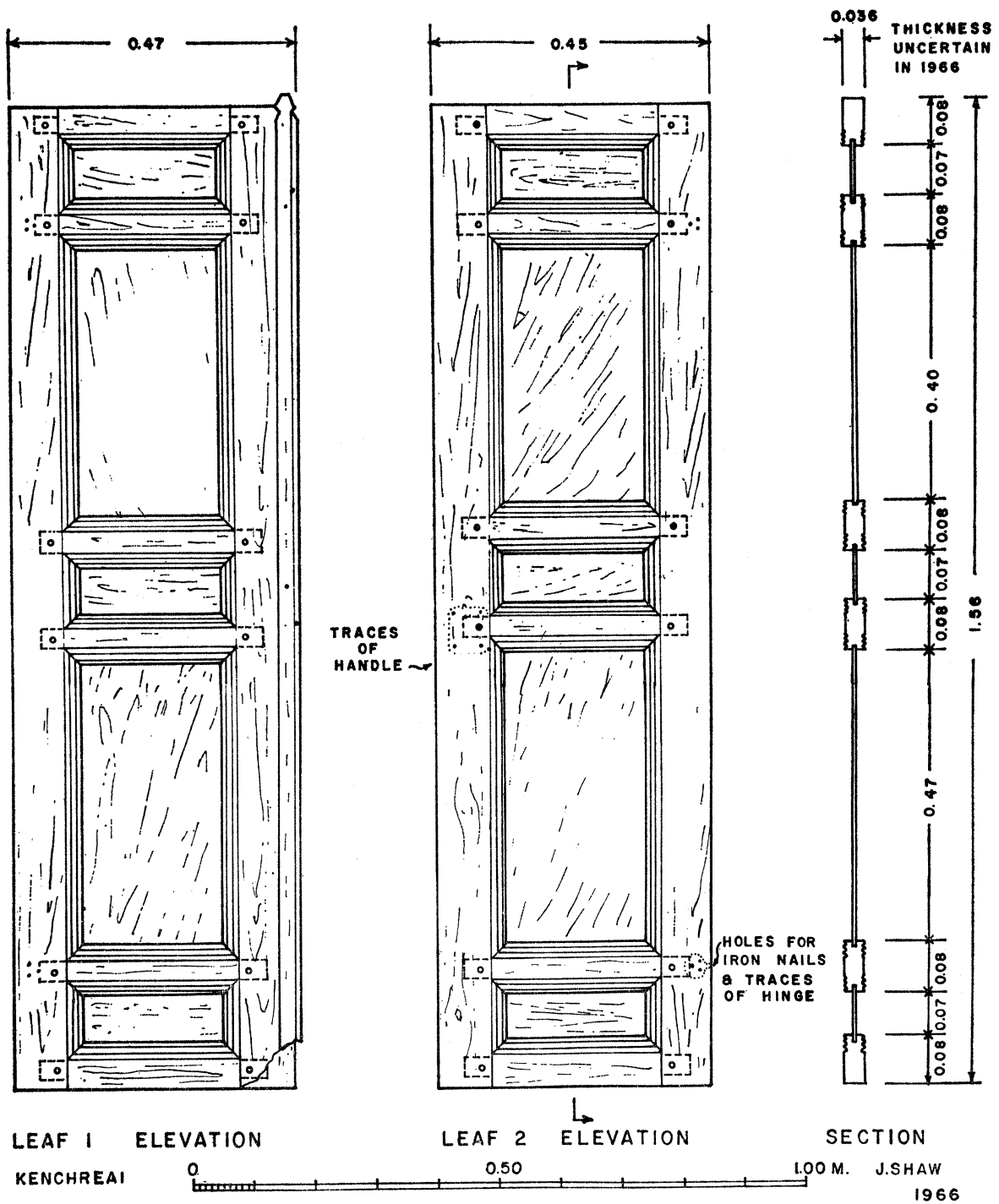


FIG. 10. Wooden Doors from Debris in Basement of "Temple."

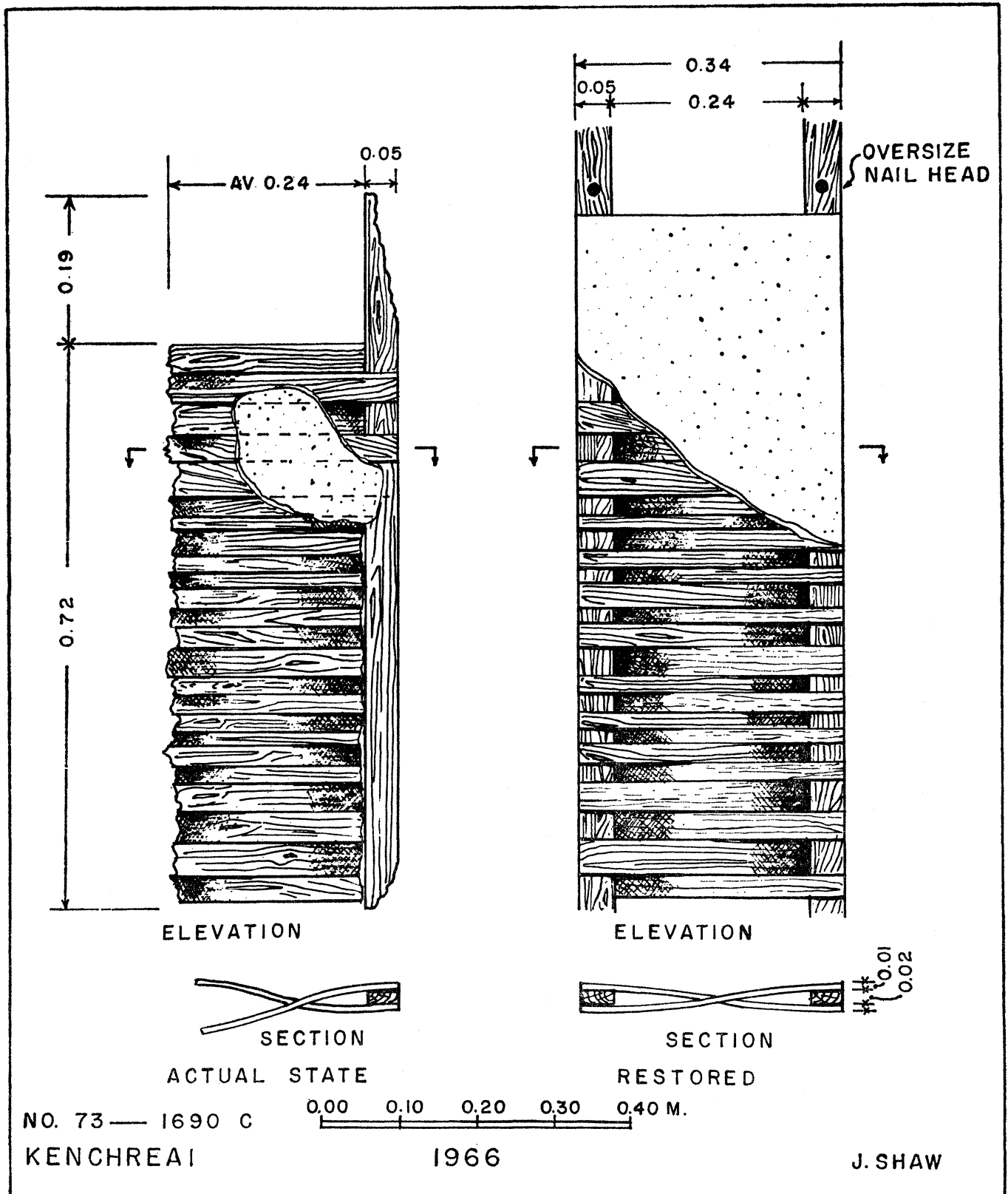


FIG. 11. Lattice-like Construction of Wood from Debris in Basement of "Temple."

to the southeast. Only the northern half of the gate structure is preserved. It consists of a sill, or half a sill, with the cutting for the door jamb still visible; restored to twice the preserved length, the door would have been about 2.00 m. wide. Flanking this on the northeast is a massive foundation of random and roughly cut blocks whose top is now about at modern sea level, forming a trapezoidal shape about two meters deep and three wide. It appears on the plan to abut against a narrow concrete wall foundation extending southeastward, but the latter lies over the foundations of the gate structure and must be later. Restoring the arrangement symmetrically we would have a gate, between two massive pedestals or pylon-like towers.

Southeast of this there is now clearly visible in the water the outline of another court with a door of more conventional design. It has not been possible to examine this closely, though it seems to include a southwestern wall extending from the south corner of the "temple," over the position of the hypothetical southwest "pylon" of the inner court.

Northwest of the apsidal structure and the "temple" ran a long hall a little over three meters wide (Figs. 5, 6). The southwestern wall of this hall and the southwestern part of its northwestern wall have not been found and seem to have been uprooted in some massive disturbance. The northeastern wall is a continuation of the northeastern wall of the apsidal structure, changing from poros blocks to smaller stones and concrete; the northwestern wall is of stone and hard mortar throughout. The construction of the northwestern wall shows clearly that when it was built the ground level was higher at the northeast end, about MSL +0.10 m., than at the southwest. Below the original ground level the stonework is ragged and not finished; above that level, the masonry is smoothed over with mortar struck with straight or curved lines, like the facing in the basement of the "temple." The floor level of the hall when in use must have been around MSL +0.10 m., or a little higher than the top of the foundation of the stairs leading down into the apsidal structure, as is indicated not only by the stairs themselves but by the presence on the northwestern wall, above that level, of remnants of a coat of finer plaster with traces of fresco decoration.

The stratification relating to the walls of the northwestern hall provides the only direct external evidence for the date of the complex to which it belongs, the apsidal structure and the "temple." The hall spreads over the road, southwest of the warehouse, and the structure southwest of the road described above (p. 135). Its walls were laid in cuttings made into the road, and its floor was made by fill thrown in on top of the road and the plundered structure south of it. Unfortunately some of this fill is gone, perhaps as a result of wave action after the ruin of the complex itself, and that which is left has quite possibly been contaminated by wave action also. Therefore this evidence for dating is difficult to evaluate. With some caution one might say that direct internal evidence might be seen in the mosaics of the floor of the apsidal structures, especially the marble chip mosaic in the apse. These have been thought

to be appropriate to the later part of the first century or to the second century after Christ.

The collocation of materials found in the cellar of the "temple" provides a tantalizingly ambivalent suggestion of date. The material suggests that a job of construction or extensive repair and redecoration was in process at the moment of the destruction and abandonment of the complex; the presence in the adjoining apsidal area of the crates of opus sectile panels would fit this conception. The masses of red grit in the "temple" area might suggest that much concrete or mortar was being prepared, which would suggest that the operation in question was the original construction of the complex. But the crates of opus sectile rest on the finished mosaic floor of the apsidal area, not only finished but repaired in places. This would suggest that the work which was interrupted was (if it involved the apsidal room and "temple" complex and all) a repair and redecoration.

In any case, in the bottom of the pile of wood and other material were found lamps, pottery and coins, which, so far as they have been analyzed, would point to the early part of the fourth century as the date of the interrupted work. If this work was a matter of repairs, the date of the original construction might go as far back as the second century, though taking into account such indications as are thus far available from the northwest hall, it must be later than the early part of that century at least.

The third section, lying to the northwest of the central section with the complex of apsidal structure, "temple" and hall, is covered by the remains of a Christian church, and it is often difficult to disentangle the Roman from the Christian remains (Fig. 3). Indeed, the key to the whole situation is a structure which at first glance on the plan appears to be the apse of one period of the church, and in earlier reports was described as representing the latest phase of the church. This is the western of the two apses showing at the southeastern end of the nave of the church, at grid squares 2170-75/14570-75. In the compacted accumulation of masonry within this apse there may be observed several periods, or at least stages, of construction.

Of the first, there may be observed about a meter northeast of the southwest wall of the warehouse two blocks of stone in a line, their southwestern face parallel to the southwest wall of the warehouse; about 5.00 m. northeast of the southwest wall are three blocks in a line forming a right angle to the partition wall of the warehouse between the fourth and fifth sets of interior rooms. Both of these rows of blocks rest on the floor of the warehouse (most of the flooring had been removed by trenches from World War II, but where it is preserved, it is easily identified in a hard packing of small stones including flinty pebbles). With these orientations and this ground level, it would seem that these two rows of blocks represent an interior remodeling of the rear room of the fourth set of rooms in the warehouse.

The apse itself, constructed of heavy blocks of roughly squared stone, with



intervening spaces filled with small stones and hard mortar, and resting on a deep foundation of small stones and mortar, is built over and around these two straight walls (Pl. 46, a).

The apse itself is somewhat more than a semicircle and from each extremity the foundations project outward, away from the center. The projection to the northeast is almost immediately broken off and much obscured by the later arrangements of the church; the extension of the southwest continues southwestward about 5.20 meters. Immediately southwest of the spring of the apse it is represented by a block of poros lying on the demolished southwestern wall of the warehouse, and covered by the later southwestern wall of the nave of the church; thence it continues as a concrete foundation. About 4.50 m. southwest of the spring of the apse this concrete foundation makes a right-angled turn to the northwest, continuing precisely beneath the wall of the apparent "aisle" of the later church. It is distinguished from the later church wall, however, by the fact that the foundation of the church wall, though it sometimes rests directly on the top of the Roman foundation as preserved, sometimes rests on an intervening layer of mud as much as 0.15 m. thick. Furthermore, the wall of the church complex continues unbroken some three meters farther southeast than the lower Roman wall, which, in turn, continues at least a short distance farther northwest than the church wall, though the evidence at that end has been almost entirely destroyed by World War II entrenchments.

Within the apse is a long straight wall stretching in a northwesterly direction for about 5.50 m. from the interior of the apse, south of its center and projecting outside the area enveloped by the apse itself. At right angles to this projecting wall extend northeastward three well-cut blocks; they are well preserved to the point where their line is crossed by the World War II trench. Beyond the trench are the battered remains of concrete foundations which continue the line of these blocks, and return at right angles southeastward to the northern spring of the apse.

Perhaps also to be associated with these arrangements is a foundation or footing extending southeastward from the wall southwest of the apse, about 2.00 m. southwest of the southwest wall of the warehouse. This is relatively narrow, little over 0.50 m. in width, but appears to be earlier than anything in the church, and is constructed of small stones in hard mortar, like concrete.

There are a few other slight remains that may ultimately prove to be involved in this complex, but the problems are numerous and obscure and it is probably futile even to try to describe them objectively at this time. Beyond any doubt, however, the complex does represent a major period between the warehouse and the developed church.

#### THE CHRISTIAN COMPLEX

Over the western part of the central unit of warehouses and spreading thence to the south and west are remains of a complex of Christian buildings of which the

core was a church (Fig. 3). Much of this has been excavated, though the excavation is incomplete. The complex is separated into a southeastern and a northwestern portion by a narrow, irregularly shaped space that may be designated the "exonarthex," occupying for part of its extent the passage between the central and western units of the warehouse, and extending southwest of that. The southeastern portion consists of a nave with an apse and a narthex lying over the Roman apsidal structure which had replaced the rooms of the western corner of the central unit of the warehouse, a series of narrow halls adjoining this to the southwest, and what appear to have been two narrow halls adjoining the nave to the northeast. The northwestern portion consists of a number of smaller, more irregular rooms, of which only one has been completely exposed.

In attempting to describe the remains southeast of the exonarthex (Pl. 46, a) it may be convenient to begin with the observation that the foundation of the southeast wall of the exonarthex is evidently a continuous, single construction from the first wall northeast of the nave to the first wall southwest of the nave—to constitute, in other words, a single front wall for the nave and the halls immediately flanking it, which appear on the plan, perhaps deceptively, to be two aisles, one on each side of the nave. Whether the front wall originally continued farther northeastward or southwestward is less certain.

The side walls of the nave, and the apse, create a unit about 21.5 m. in length over all, and 6.25 m. wide, on the inside. The construction is uniform throughout, with a lower foundation of small stones in moderately hard gray mortar. The top of the foundation and the first (only preserved) course of the superstructure are of squared poros blocks of random height and length, about 0.55 m. wide, many re-used from earlier structures as shown by clamp cuttings and pry holes on them. The joints and some gaps between the poros blocks are filled with mortar and occasional patches of small stones and tile in mortar. In the middle of the front wall and the wall of the narthex there are door openings, that for the narthex indicated by a foundation somewhat narrower than that of the rest of the wall, for a sill about 1.90 m. wide. In both nave and narthex were found fragments of mosaic flooring at a level of about MSL +1.15 m.

At a point 7.50 m. southeast of the wall separating nave and narthex, imbedded in the southwest wall of the nave, there projects a block of marble cut with a groove some 0.10 m. wide, such as might receive the bottom of a slab for a screen or balustrade. The top of this block is at about MSL +1.53 m., or some 0.40 m. above the floor of the nave as represented by the mosaics. The spring of the apse, however, is 4.50 m. farther to the southeast, so that the raised area extended substantially into the space of the nave. It should be observed, further, that the blocks of the structure previously described as part of the earlier Roman apse stand to a height of MSL +1.88 m., or 0.35 m. higher than the floor of the raised area of the Christian apse.

The foundation of the apse itself is built in two fairly distinct elements. The outer continues unbroken the walls of the nave, with an outer diameter of 7.60 m. and an inner diameter of about 6.00 m. Within this is another foundation, about 0.60 m. wide at the bottom, surmounted by a superstructure recessed from the inner edge of the lower foundation about 0.12 m., producing a semicircle about 5.00 m. in diameter. The effect produced in the appearance of the foundation would suggest a bench running around the base of the wall of the apse, although in fact all of the masonry preserved lies below the level of the floor of the nave and, of course, of the apse itself.

The first foundation southwest of the nave lies at an interval from the nave of 3.00 m. and, as we have already noted, precisely on the line of the southwest wall of the Roman apse complex (Pl. 46, a, b). The wall as preserved consists of a single course of blocks whose top is at MSL +1.09 m., or a few centimeters lower than the nave of the church. On the foundation stand five plain, rather crudely finished column bases, so that it must be considered a stylobate, not a wall. Between the bases, however, are remains of crude masonry of small stones and mud mortar, the southern face of which bears remains of a simple plaster surface. At the southeastern end this wall bonds with a wall projecting southwestward from the nave, opposite the spring of the apse, and 2.00 m. northwest of this there is a thin, evidently later wall. In the space between the nave and this stylobate there is no trace of flooring other than packed earth, except in the small room formed by the later wall at the southeast end, which was paved with re-used marble slabs. At some secondary period, benches of crude masonry of stone and mud mortar, with neatly plastered surfaces, were built on either side of the door entering the space from the northwest, on the northwest face of the new cross wall, and on the northwest face of the original end wall at the southeast.

The second foundation southwest of the nave lies about 3.20 m. southwest of the first; and there is a bench built along its northeastern face. The enclosed space was paved at a secondary period with slabs of marble in a simple geometric pattern, so that it is conveniently designated as the "Marble Hall" (Pl. 46, b). The foundations of the northwestern wall of the Marble Hall have been cut away by a World War II trench at the point of juncture with the end of the stylobate southwest of the nave, so that whether the two bonded or represent different periods can no longer be ascertained. In the northwest wall itself, however, was a door about 1.25 m. wide connecting the exonarthex with the Marble Hall. At the southeast end, also, World War II entrenchments have removed much critical evidence. There is preserved, beneath the marble floor, a foundation of small stones in mortar projecting southwestward from the corner of the earlier Roman apse complex beneath the stylobate southwest of the nave of the church; this continues to the southwest wall of the Marble Hall making a clear-cut corner with it. The line of the southwest wall of

the Marble Hall southeast of this corner falls in the area of the excavation for the entrenchment, and there are no remains preserved. It is clear, however, that the southeast wall of the Marble Hall in the period of the marble floor itself was continuous with the southeast wall of the space between the stylobate and the nave. In it there is preserved a marble sill for a door opening about 2.75 m. wide, divided by a support in the center resting on a base in the form of a simple Early Christian impost capital.

The southwest wall of the Marble Hall itself presents a number of peculiarities and problems. The lower foundations are made of stones and tile in a fairly soft mortar. On the surfaces, above a level of about MSL +0.30 m., are affixed many fragments of tiles, and the whole is covered with a coat of plaster on which appear straight and curved lines struck in with the trowel. The foundation continues northwestward across the southwest end of the exonarthex, and beyond, still farther to the northwest, beneath the floor of a later room in the area. The masonry from ground level, however, or about MSL +0.90 m., makes a clear corner with the superstructure of the northwest wall of the exonarthex.

The interior arrangements of the Marble Hall itself are somewhat obscured by the various remodelings. Presumably there was originally an earthen floor at about MSL +0.90 m. at the northwest and MSL +0.80 m. at the southeast, or some 0.20 m. below the stylobate of the first wall southwest of the nave. At a later date a bench about 0.50 m. wide and almost as high was constructed of random stones in mud mortar along the entire northeast side of the southwest wall, contracting the floor space by so much; and it was at this time or later that the remaining interior area was paved with blue and white marble slabs. At the same time, one may suppose, a revetment of thin marble slabs was laid on the vertical face of the bench and on the southwest face of the masonry between the columns on the stylobate southwest of the nave, mentioned above (p. 154).

The third foundation southwest of the nave is built close against the southwest face of the southwest wall of the Marble Hall. Immediately to the southwest of this are two rather irregular lines of masonry, suggesting a drain; then a fourth foundation, and finally a fifth, built face to face with the fourth. These are all poorly built of small stones in soft mortar, and ill preserved. The spaces between are closed at the northwest by similar walls, and at the southeastern end are smaller rooms of similar construction. Circumstances have not permitted a complete study of these, and some of the problems seem insoluble, but it is probable that they represent additions or alterations in a late and impoverished period.

Across the southeastern end of the Marble Hall, between it and the hall running along the northwest end of the submerged apsidal structure and the "temple" of Roman times, is an area which has been several times paved with square tiles. Much of the room has been cut away by wave action, but it is clear that part of the sur-

rounding walls were lined at some period by benches made of small stones in mortar and lined with plaster. Flanking this were small rooms represented by slight and ill-preserved walls, some of which are also lined with benches.

Looking now northeast of the nave, one observes remains of two walls parallel to the northeast wall of the nave, preserved for a short distance into the sea. They are actually foundations, of miscellaneous stones in mortar, and present no distinctive features. It might be noted, however, that the wall crossing the space between the two outer walls at the northwest is of slighter construction than the rest of the foundations across the front of the church, and suggests the foundation for a long sill rather than a full wall.

We may now turn to the exonarthex, stretching across the front of the nave and the halls beside it (Pl. 47, a). The southeast wall of this, as we have seen, is the continuous front of the nave and its adjuncts. The northwest wall of the exonarthex opposite the nave is the re-aligned southeast wall of the northwestern unit of the warehouses, previously described (p. 133). From this point southwestward, the northwest wall of the exonarthex is constructed in a manner resembling that of the nave of the church, continuing to the southwest wall of the Marble Hall, which is extended so as to form the southwest wall of the exonarthex. The floor of the exonarthex in front of the nave and to the southwest is paved with mosaics, in panels of four different patterns arranged rather irregularly, like rugs. The northeast end of the exonarthex is now paved with large square terracotta tiles, and there are remains of a second, poorer floor, some 0.40 m. higher, over it.

At some period after the laying of the mosaics, two benches of masonry of small stones in mud mortar, smoothly plastered over, were built, one against the northwest wall of the narthex opposite the nave, the other farther to the southwest.

Northwest of the exonarthex there have been exposed parts at least of a number of rooms whose interrelationships, and relationship to the church itself, are far from clear. In the first place, there is the space of the three rear rooms of the northwestern unit of warehouses, remodeled as described previously. This area could apparently have been entered from the exonarthex by a door in the northwest wall which it has not been possible to clear. This door would have given access to the second room-space of the warehouse from the rear; thence there would have been access by a broad door to the south corner room as remodeled, with the floor of marble slabs. This room, it may be recalled, had been thrown together with the spaces of the rear rooms of the second and third sets by opening a large door between the first and second rooms and eliminating the wall between the second and third. The floor of the area of the second room had been paved with mosaic, and the floor of the space of the third with terracotta tiles. It will also be recalled that the walls, in their new arrangement, had been covered with plaster and in part at least with fresco. One block of the frescoed wall was found in the debris on the floor; the design (Pl. 48, a) shows the waist and thighs

of a man striding to the right, with the feet of a child against his waist; in front of him are the head and outstretched arms of a small man or child, head downward, his face distorted and what may be blood pouring from his head.

When the fresco was painted has not been determined, but within the space of the second room, cut through the mosaic floor and overlapping the foundations of the wall between the second and third room, is a structure clearly belonging to a late phase in the history of the site (Pl. 47, b). It consists of a waterproof basin, with a kind of canopy in front, apparently a baptistery. The basin is about 2.25 m. square on the outside, and 1.60 m. square inside. It is built of rough stones and hard mortar, standing about 0.60 m. above the floor outside but sunk about 0.20 m. below floor level on the inside, except for a step on each side. On the face of the front (north-west) wall is a curved recess in which are still preserved fragments of a facing of slabs of colored marble; traces of mortar adhering to the outer face of the rest of the wall suggest that they too were faced in the same way. The interior is lined with waterproof cement.

In front of the basin are the foundations of an enclosure about 2.30 m. square, though it is not actually square, having odd angles at each corner. These foundations consist, on each side, of slabs cut from marble columns, with a groove cut along the top as though to receive an upright screen-slab; and another across the front with cuttings to receive the sill and jambs of a double gate. There is a column base at each front corner, and there are indications of other columns standing at the ends of the side foundations against the corners of the basin.

From the south corner of the bottom of the basin a pipe leads off to a drain channel set in a trench cut through the mosaic floor. The channel is made of stones in which a rectangular watercourse, lined with cement, is cut.

The complex northwest of the exonarthex southwest of this seems to have had no direct access to the area we have just described (Fig. 3; Pl. 47, c). It was approached from the exonarthex through a large door in its northwest wall, opposite the Marble Hall. The door opening is about 2.00 m. wide, separated into two passages by a column base in the middle. Through this, one entered a large room some 3.35 m. by 11.50 m., extending some 3.00 m. southwest of the line of the southwest wall of the Marble Hall, though we have noted that foundations which seem to be a continuation of the foundations of that wall pass beneath its floor. This floor now consists of small tiles, neatly laid. The northwestern wall of this tiled room is perhaps less solidly built than those of the main church, though it includes some large re-used ancient blocks. The southeastern wall of the room, which would be the outside of the northwest wall of the exonarthex, has been finished with two coats of heavy plaster in which are imbedded large potsherds and fragments of tile and stone slabs. Through the northwest wall is a door about 1.15 m. wide, distinguished by a marble slab set in the floor in front of it.

Through this door there was access to an area only partially cleared. It was paved with random blocks of heavy stone, not absolutely flat, but sloping upward slightly to the west. Opposite the door, on the pavement, were dilapidated remains of what may have been a flight of stairs, built of miscellaneous stones including two marble column bases (Pl. 47, c).

From the paved area a narrow door, later at least partially blocked up, perhaps by construction associated with the stairs, led to the northeast. The door was about 0.75 m. wide, and through it one descended by two shallow steps into a room about 2.50 m. by 5.20 m., extending to the southwest wall of the warehouse (Pl. 48, b). At the bottom of the steps was a slab, around which were arranged lengths of marble, some trimmed from broken column shafts, to form a raised rim, sealed with waterproof cement. The rest of the room was paved with miscellaneous slabs of stone and marble, sloping down from southeast to northwest. The joints between the slabs and along the walls were sealed by waterproof cement. Against the middle of the southeast wall there is an area about 1.50 m. square, in which there are poros stones rising higher than the main level of the floor; within this area there is no trace of waterproof cement. Along the northwest wall there is a bench some 0.35 m. high and 0.60 m. wide, built of stones set in mud, covered on the top surface by a large stone slab. This room has been called "The Bath."

Over seventy graves were found in the area of the church. Of these some twenty-five were in the nave, four in the narthex, six in the exonarthex, five in the hall just northeast of the nave, five in the hall just southwest of the nave, five in the Marble Hall, and a dozen in the area to the southwest. Some of these no doubt belong to the period of the use of the church, some were clearly much later, like one in the Marble Hall which is sunk through the bench that marks the last phase of its history, and others that were well above floor levels.

A number of architectural fragments and minor inscriptions were found in the area, both classical and Christian, but it is not feasible to deal with these at this state of the investigation.

As to the date of the complex in its various phases, it is premature to attempt to speak with any precision. Clearly it had a fairly complicated history. In the deposits that might be taken to date the floor and walls of the nave itself, there was found nothing that has been recognized yet to be as late as the middle of the fourth century after Christ; in the filling around the drain from the canopied basin northwest of the exonarthex came many coins, some of the early part of the fifth century. These figures, however, may have to be adjusted, up or down, in the light of further study. In any case it seems clear that the complex was in use, in one form or another, through the sixth century at least.

## AREA C — THE NORTHEAST END OF THE HARBOR

The results of investigation at the northeast end of the harbor (Fig. 12) may best be described in terms of three sections. The first of these would be the spine of the promontory, facing on the open sea; the second, the submerged end of the promontory and the mole projecting from it; the third, the slope of the promontory facing on the harbor.

## THE PROMONTORY

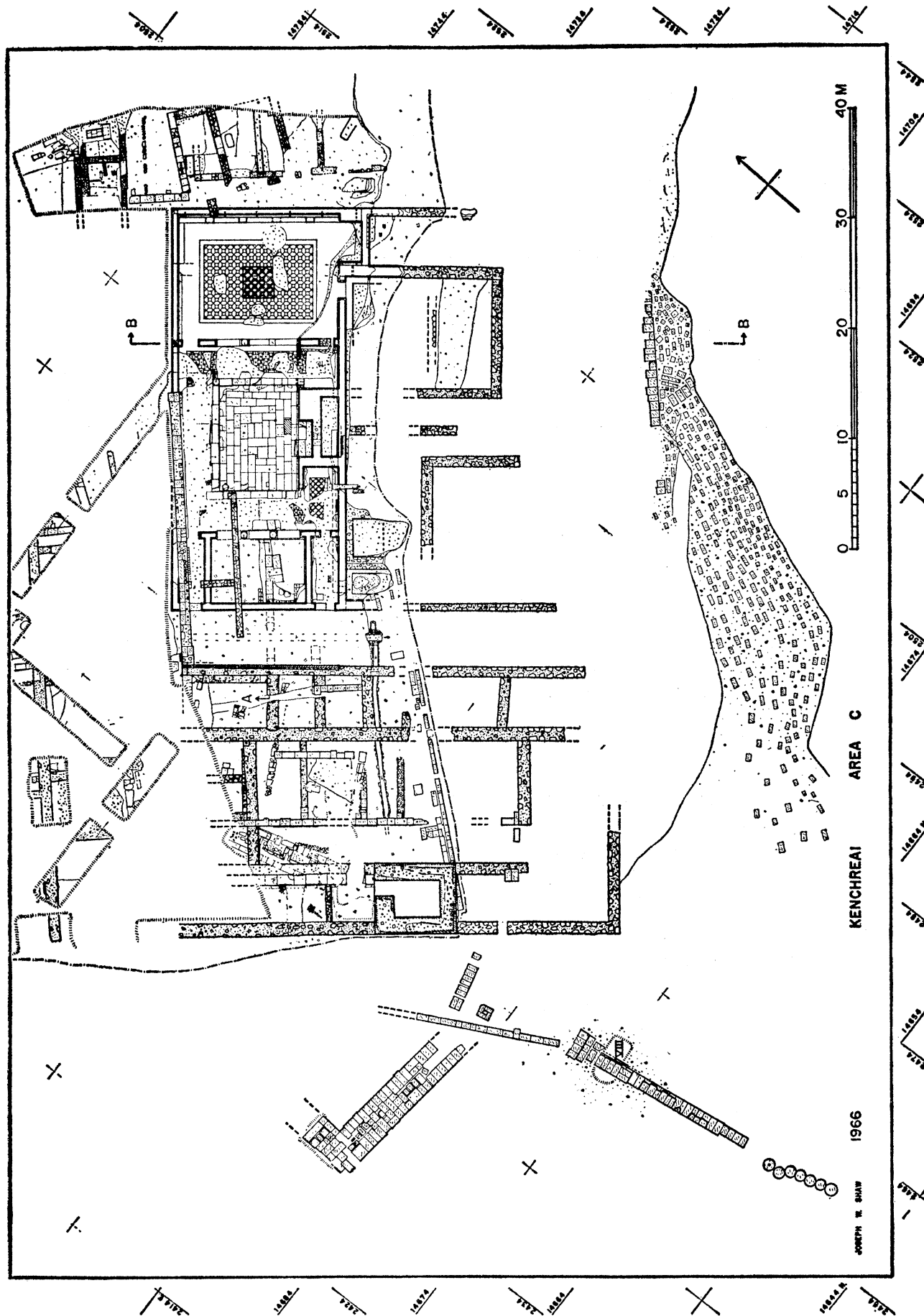
On the ridge of the promontory running down to the point now constituting the northeastern terminus of the harbor are the remains of several sets of buildings which have been generally cleared but not fully excavated in depth. Moreover, the seaward face of the promontory has been cut away by the sea (Pl. 50, a, c), removing large parts of several of the buildings which are much better preserved on land (Pls. 49-51). The remains may be most conveniently considered in an order combining roughly the topographical relationship and the approximate chronological sequence indicated by the position of the walls with reference to each other.

The most conspicuous point of reference topographically is a massive tower still standing at the very apex of the promontory (Pl. 50, c, d). This is one of the latest structures on the site, and will be described, itself, below, but it makes a convenient point of reference for describing the rather complicated array of remains in the area. It is oriented so that its longitudinal axis bears approximately  $38^\circ$  west of north; its other axis,  $52^\circ$  east of north. About 30 meters northeast of its southwest face is a large brick building (below, pp. 164-167) with the same orientation, of which about half is fairly well preserved on land (Pls. 49, b, 50, c, d), the rest having been largely eradicated by the sea, leaving only a few remains of its foundations visible in the water (Pl. 50, a, c).

Between the tower and the brick building are the superimposed remains of several complexes of structures (Pls. 49, 50, b), of which the most nearly complete is the latest, marked most conspicuously by four fairly heavy parallel concrete foundations with the same alignment. One lies under and projects beyond the southwest side of the tower at each end; a second lies under and projects beyond the northeast side of the tower; a third is about 11.00 m. northeast of the second, and a fourth, about 4.50 m. northeast of the third. As preserved, these are nothing more than foundations, or sub-foundations, and measure around 0.90-1.00 m. in width, except for the third, which seems to be fairly consistently about 1.20 m. wide. The "concrete" of which they are made is a mass of broken stone set in moderately hard lime mortar.

The first foundation extends some 15.00 m. southeastward from the tower, slightly submerged beneath the sea, to a corner, whence extend northeastward the remains of a wall which may mark the southeast end of the building. About 8.00 m. northwest of this is a transverse wall between the second and third longitudinal walls:





and about 33.50 m. northwest of the southeast end-wall is another. The northwest end of the building has not been located, but the remains which have been cleared suggest a structure about 24.50 m. wide with an inner courtyard of about 24 by 11 m. in extent. About four meters northwest of the tower is a slight foundation connecting the first and second longitudinal walls, and the third and fourth longitudinal walls are connected by a series of five transverse walls, carelessly aligned, not all of them at right angles, which may be later than the original building. A line of eight poros blocks parallel to and just southwest of the third longitudinal wall also belongs to a secondary form of the structure, set into a heavy lime pavement of the courtyard.

Much of the masonry of the concrete complex lies over the remains of an earlier complex with the same alignment, represented by foundations of small stones set in mud and by the lowest parts of its superstructure built of well-trimmed poros blocks, some of which were re-used from a still earlier structure. The "poros complex" included a stretch of masonry north of the tower which gives the impression of having been a stylobate facing southwestward toward the harbor. The topmost preserved course is about 1.00 m. wide, and is much worn; it rests on a course of poros blocks which project well beyond, though not enough to have formed a full step. A well-defined surface of beaten earth and gravel was found at the top of this lower course. The stylobate, where preserved, is partially covered by the contiguous masonry of the concrete period; in the vicinity of the tower and southeast of the tower, it has apparently been eradicated except for two poros blocks in the sea about 4.50 m. to 7.50 m. southeast of the tower. These two blocks may represent the original corner of the poros complex, and scattered blocks northeast of them may represent its original southeast wall.

About 5.40 m. northeast of the outer edge of the "stylobate" of the poros complex is a fairly well preserved line of poros blocks about 0.60 m. wide. This is well preserved where it lies within the courtyard of the concrete complex, and its southeast end may be seen in a block abutting against one of those in the hypothetical southeast wall of the building. The poros blocks in this wall are neatly aligned on the southwest face, but irregularly on the northeast, as though they represented the euthynteria for the southwest wall of the building, behind the colonnade represented by the stylobate.

Largely covered by the northwest wall of the courtyard of the concrete complex are remains of a wall of the poros complex extending northeast by southwest. About 5.50 m. southeast of this is a second transverse wall; about 5.50 m. southeast of this is a third, and about 3.20 m. southeast of the third is still a fourth. The northeast ends of these walls have not been found, and may be completely enveloped in the northeast wall of the court of the concrete complex.

Within the northeast corridor of the concrete complex, contiguous to the outer wall of the concrete complex at its northwest end, is a stretch of foundation of small

stones in mud mortar about six meters long, with a northwest-southeast alignment, which disappears into the mass of one of the inner cross-walls of the concrete complex. Northeast of this point, however, a line of poros blocks was discovered extending at least 11 m. to a point beneath the brick building. Moreover, about 3.50 m. southeast of this there has been revealed a parallel line of masonry, northeast of the concrete complex structure, which was exposed for a length of only about two meters. This, however, was also uncovered within the northeast corridor of the concrete complex building, largely swallowed up by another of the cross-walls of the later complex; and a well preserved line of good poros blocks with a northwest-southeast bearing was cleared for a length of about 4.50 m. This line also resembles a euthynteria, with its evenly aligned face toward the northeast.

Finally there may be associated with the poros complex several traces of what appears to have been a wall covered by the brick building, with its northeastern face about 41.80 m. northeast of the harbor face of the stylobate. This wall is represented in the sea and on the beach by a rubble foundation, under the pavement of the central court of the brick building by a large poros block which had been cut through to make a manhole into a drain, and in the northwest corridor of the brick building by a bedding cut into the native rock.

Also, inside the northwest corridor of the brick building, there was discovered a well-defined pavement of white plaster which may well belong to the poros complex in this area.

The poros complex just outlined was evidently preceded by a structure of which the most characteristic remains are three massive but crudely built square foundations about 1.00 m. square, as for columns or pillars, and the related remains may therefore be conveniently grouped under the designation "pillar complex." This complex had a somewhat different orientation from the others we have been considering: two walls bearing about  $63^{\circ}$  east of north, loosely built of miscellaneous stones set in mud, may be seen within the courtyard of the concrete complex, one a meter or so southeast of the northwest wall of that courtyard, and another some eight meters farther to the southeast. One of the pillar bases lies half way between these two walls; two others lie on a line about three meters northwest of the northwestern wall. At the northwestern end of the northeast corridor of the concrete complex may be seen some slight remains of what is in all probability still a third wall of the pillar complex, about 7.50 m. northwest of the best preserved wall. It should also be observed that a well preserved line of poros blocks in the sea, about 7 m. southwest of the tower, has a bearing of  $27^{\circ}$  west of north, or at right angles to those which have just been mentioned.

Finally, there should be observed the fact that from a point about five meters north of the tower a loose foundation of small stones has a bearing with approximately the same orientation. This foundation, moreover, is remarkable in that it is arranged

against a structure of some complexity in such a way as to suggest that it was built as part of the pillar complex in an effort to adjust the arrangements of the pillar complex to the earlier structure.

This earlier structure consists, in the part that was revealed north of the tower in the corner of the courtyard of the concrete complex, of a mass of masonry with an overall width of 2.70 m. and a linear bearing of about  $13^\circ$  west of north. The southwestern face is a continuous line of poros blocks, lost at one end in the foundation of the concrete complex. In front of this was a loose fill of small stones in clay, forming the substance of a kind of bench faced with thin slabs of soft poros (Pl. 49, a). The bench was 0.60 m. wide; projecting from it were three rectangular pedestals about 0.70 m. wide and 0.80 m. long, separated by about 1.75 m. In front (that is, east) of the benches was a surface of stiff red clay and sand, with occasional concentrations of large pebbles. At some later period than the construction of the basic arrangement just described, a foundation was laid along the east across the ends of the pedestals. This foundation was made of miscellaneous re-used blocks, on one of which there were traces of fine plaster and a finely inscribed A.

Possibly related to this arrangement are some scraps of masonry just west of the stylobate of the poros complex, about 5 m. north of the tower, including a thin slab of poros standing upright as an orthostate, recalling the lining of the benches and pedestals in the more extensively preserved section.

Also possibly related to these is a line of masonry just south of the tower in the sea: a line of poros blocks with a bearing at right angles to the main line of the best preserved set of remains.

Among the earliest structural remains in the area are those of a wall, of which part lies beneath the southeast face of the tower, and is crossed by masonry of the poros complex just inside the east corner of the tower. This wall, or foundation, is built of well cut blocks of brown poros of random length laid in two parallel lines with an overall thickness of about 1.00 m., having a compass bearing of about  $42^\circ$  east of north. The line can be traced northeastward for a distance of some thirty-two meters. At several points there are buttress-like projections landward, about a meter wide, and 1.50 m. deep. The best preserved of these is separated from its neighbor by a distance of about 3.00 m., which may represent a normal interval. The wall was not investigated in depth, but may be preserved in a single course only; this lies at exactly modern sea level, and is normally washed by the waves of the beach. On a parallel line about 3.00 m. inland are three scattered blocks near the northeast end, and about 10.00 m. inland from the northeast end, buried deeply under later construction, is a fairly well preserved stretch of an approximately parallel wall.

As to chronology, the "concrete complex" is dated by an abundance of pottery beneath its floor to around A.D. 200; the date of the poros complex may be indicated by a coin of the Corinthian duoviri as Augustan, perhaps early. There is no direct

evidence for the dates of the "pillar complex" or of its predecessor, the heavy wall with the benches. It was not possible to dig below the floor of the latter, but on its floor there were some scraps of pottery of the fourth century B.C.

Northeast of the "concrete complex" is a passage about five meters wide, through which ran a large vaulted drain with rubble concrete walls about 0.50 m. thick and a channel about 0.60 m. broad and 1.25 m. high. At the level of the top of the drain was hard packed sand and gravel, suggesting a road or at least a much used passage (Pl. 51, a); on it was found a section of lead pipe.

The rest of the area excavated, northeast of the passage, is distinguished primarily by a somewhat luxurious structure which, from the manner of construction of its major walls, may be designated the Brick Building (Fig. 12; Pls. 49, b, 50, c, d, 51, b). This went ultimately through many remodelings, some of which changed its form markedly, but in its acme it was a neat rectangular building about 36.50 m. from northeast to southwest, and at least as much in the other dimension. At least half of it, the southeastern part, has been eaten away by the sea, and only the northwestern part can be described with any degree of certainty. Except for the later remodelings, the walls are built of brick on foundations of small stone in hard mortar or concrete. The bricks as laid are triangles quartered from large squared tiles, some originally 0.285 m. square, others 0.32 m. The triangular bricks are laid with the original bake-finish edge outward as the facing, with the triangular corner imbedded in a mass of concrete, making a wall about 0.60 m. thick.

The preserved northwestern section of the building was peculiarly insulated from the rest of the structure. The sole entrance (at the ground level—the building possibly had a second story, about which we know nothing) was through two inconspicuous doors opening from the alley or passage to the southwest. Originally these led, in all probability, directly into a single space 30 m. long and 14.70 m. wide. The northeast wall of this room was removed in a later remodeling, but has been found in intrusions through the later floor and apparently continuing also southeastward until it is lost in the sea.

In the present state of the building, one of the notable features is the sunken area in the middle, 9.50 by 7.30 m., paved with heavy poros blocks probably intended to support a marble floor, and surrounded by a stylobate of blue marble on which stand marble columns. There were four columns on each side, as indicated by the bedding surfaces for the bases and a few Corinthian bases of white marble still *in situ*. The bases have square plinths, about 0.56 m. square, and supported shafts about 0.45 m. in diameter. Several fragments of unfluted columns of bluish marble were found beside the bases, one preserved to a length of about 3.50 m., with an upper diameter of 0.40 m. (Pls. 49, b, 50, d). No trace of the capitals was discovered.

This peristyle basin would have occupied the center of the 30-meter room which constituted the original form of this part of the building; it is also symmetrically

located with reference to features of later alterations. One of these latter is a spacious room, 8.70 m. by 5.90 m., at the southwest end, formed by brick walls separating it from passages leading to the doors; the northeast side, facing the peristyle, was open save for two columns standing on a stylobate. That this room is indeed a secondary addition is suggested, if not proven, by the fact that the brick of the walls which form its sides does not bond with the brick of the wall constituting the southwest wall of the building.

The northeast end of the unit was obviously remodeled extensively at a secondary period, and perhaps at the same time as the construction of the room we have just noted. The original northwest wall was removed, as we have observed, and replaced by another six meters to the northeast. The whole northeast end of the building was made into a separate room 11.00 m. deep by spur-walls extending 3.60 m. from each side wall, each having a doorway 1.20 m. wide, leaving a central opening of 7.60 m. In the middle of this were two columns, so that the pattern of the added arrangement at the southeast end was repeated. In this new arrangement, the sunken peristyle court is again symmetrically disposed, with a surrounding gallery 3.60 m. wide.

The new northeast room presents a number of notable features. In the first place there is an alcove 2.10 m. deep in the southeastern wall near the east corner as it now stands (Pl. 50, c). This was probably, in the first remodeling, the beginning of a passage 3.50 m. wide between the new outer wall of the building and the old, leading from this part of the building to the elements to the southeast now lost in the water. The passage has been walled up with later masonry, of which the lower part is of neatly shaped poros stone and only the upper part of brick. In the second place, the new northeast wall is unusually thick, about 0.80 m., and in the east corner the rock of the hill behind protrudes through the line of masonry, though it is trimmed down to form itself the interior surface of wall. Finally, all along the bottom runs a brick-built ledge or bench, about 0.45 m. wide and 0.48 m. high; on this stood four brick pilasters about 0.72 m. wide and 0.45 m. deep. These pilasters nowhere bond into the main part of the wall.

Possibly in this, although perhaps in another, period of remodeling the southeast columns of the peristyle were removed, and in the corridor behind was constructed a broad rectangular niche 3.20 m. wide and 1.30 m. deep, flanked by wing-walls erected on the stylobate itself. The construction is largely brick, but includes also heavy blocks of poros at the bottom. In the face of the wall at the rear of the niche are two vertical channels cut or set in the brick.

All the walls of these rooms were covered with plaster on the inside and out. Among the few surviving fragments of the interior plaster are some with painted designs, including a few miniature human figures. In all of the floor spaces except those of the peristyle court and the southwest room were found more or less well

preserved mosaic paving: that in the large northeast room was almost perfectly preserved (Pl. 51, b). In all of these the patterns are relatively simple geometric designs. It seems clear that they date from no earlier than the first extensive remodeling, and the one in the remnant of the southeast corridor of the peristyle left by the construction of the niche was designed to fit the new space and must therefore date from no earlier than the construction of the niche.

East of the southeast wall of the peristyle court that we have been considering, the remains of the Brick Building are much eroded by the sea. Behind the niche that was built along the southeast stylobate of the court, and hence actually within the space of the original corridor around the peristyle, there was arranged a long narrow sunken basin, approached from the east by a flight of two steps. The basin is 1.40 m. wide and 5.30 m. long; the floor, paved with marble slabs, is 1.00 m. below the floor of the peristyle room. The steps were also lined with white marble slabs, which have been stained green to a height of about 0.50 m. above the floor. At the southwest end a hole cut through the bottom of the wall provides drainage to a larger drain running beneath the building (see below).

Of the other rooms east of the peristyle room (of those actually east of the southeast wall) there are some meaningful traces of four. At the northeast end in the space between the original outer wall of the building and the later outer wall are traces of a floor about 0.30 m. below the floor of the peristyle suite. Southwest of this is another room with a floor apparently about 1.10 m. below that of the peristyle; remains of foundations east of this in the sea suggest that it may have measured about 13.50 by 10.00 m. Along the southwest wall of the building was a room with a floor about 0.50 m. below that of the peristyle; adjoining it to the northeast was another with a floor about 3.40 m. wide and 0.70 m. lower.

The southwesternmost room presents the peculiar feature that while the center part of the floor is laid on a solid foundation going down for over a meter, under the floor along the three preserved sides ran a well built channel with a floor at a depth of 1.20 m. below the depth of the room itself. The channel is 0.50 m. wide on the northwest and southwest, but only 0.30 m. wide on the northeast. It is connected by a channel 0.50 m. wide through the southeastern wall of the peristyle suite with a channel running northeastward along that wall for a distance of about 12 m., where it seems to veer off northward under the peristyle court, but has become too small to follow by excavation. In the better preserved lower reaches it is well built of tile, including semicylindrical tiles serving as a vaulted roof. It has been repaired in less refined style, and has a secondary outlet to the southeast about 9 m. northeast of the main outlet.

The building evidently underwent many vicissitudes after the major remodeling. There are traces of several repairs or minor remodeling, in careful style. The two doors on the southwest wall were made narrower, the southeastern by a repair includ-

ing a considerable section of the adjoining wall, in masonry consisting of smooth-faced poros blocks, roughly rectangular in shape, set in thick mortar. Similar masonry was used to remodel the area of the east corner, where a higher floor of small diamond shaped tiles was laid over a small section.

The building suffered at least one major disaster, resulting in the fall of large sections of the brick wall onto the floor. Some of these, in the north corner area, show that the walls must have risen considerably higher than their present three meters at this end.

However, the brick of the wall along the northwest side has been replaced from a point 17 m. from the north corner by a heavy wall of miscellaneous poros blocks and mortar, at a slightly different orientation. This late wall continues indeed beyond the west corner of the building, across the alley or passage, to the "concrete complex" previously described. At the same time the wall lining the entrance passage at the west corner was replaced by a comparable wall parallel to the new heavy outer wall, and also extending across the alley or passage to the "concrete complex." Part of the new arrangement may be a relatively flimsy wall of stones and mortar, itself shaken and found leaning at an angle, constructed along the top of the plundered foundation representing the northeast wall of the "concrete complex."

Along the northwest side of the Brick Building was found a thick deposit of road metal, hard packed sand and gravel. This was more concentrated higher on the hill, as it approached the rock-quarry scarp extending along the northeast end of the building and continuing northwestward around the hill, but became more diffuse and vague lower down as it approached the water front. About 13.00 m. from the northwest wall of the Brick Building the thinning edges of the road were cut through for the massive concrete foundations, almost a meter thick, of a wall that has been followed from grid point 2432/14720 to 2460/14745, and which probably ran in a straight line from the shore to the quarry scarp, thus enclosing the whole length of the spine of the promontory.

Northeast of the Brick Building there have been laid bare the remains of two sets of buildings, one dating perhaps from around the fifth century after Christ, the other from the second or third. They are both simply made, of re-used blocks and stones set in mud mortar, and in each period the plan appears to have been simply a row of plain rectangular rooms facing on a narrow passage along the Brick Building. At the north corner of the Brick Building, the gravel road which ascends along its northwest side continues on up around the hill, narrowed in the second period of construction in the area, and again in its later repairs and adaptations.

The most remarkable fact ascertained in the excavation in this area is that the rock scarp which is so notable a feature of the hill, facing down on the harbor, continues buried behind the Brick Building to its eastern corner, and the floor of the quarry which created the scarp lies, north of the Brick Building, at almost the level of



the floor of that building. The road, then, is carried on a fill of fairly clean earth and gravel over three meters deep as it reaches the north corner of the building and passes onto the rock surface of the hill beyond. Most of this fill is Roman, of the second century and perhaps earlier, but close on the floor of the quarry there was found nothing that has been identified as being as late as the middle of the fourth century B.C.

The floor of the quarry itself was the soft marly bed which underlies much of the area around Kenchreai; on it were found some slight remains of flimsy walls of unworked stones set in mud, and some holes, as for posts, cut into the marl.

Finally, we may return to the tower at the end of the point. This is about 6.50 by 7.50 meters in outer dimension, and stands now about 3.50 m. above the sea, seven courses of poros blocks in height. The masonry walls are about 1.50 m. thick, the blocks layered in relatively soft cement. The interior is filled with broken stones and clean earth. An opening about 1.50 m. wide, about 1.50 m. above sea level, now exists on the northwest side, though the interior filling seems to rise higher than the bottom of this opening, which may therefore date from the final periods of disuse and decay.

As to the chronology of these structures, we have noted indications that the earliest mentioned are perhaps Hellenistic in date. So far as it has been evaluated, the evidence of potsherds for the original date of the Brick Building would suggest the latter part of the first century after Christ, possibly a little later. The final phases would be as late as the fifth and sixth century.

#### THE SUBMERGED AREAS

In the sea close off the promontory there are numerous submerged remains (Fig. 12; Pl. 50, a, c). Some of these belong to structures of which substantial parts are found on land, and these have been mentioned, so far as they have been recognized. It is left to indicate others of more independent character.

On the seaward side of the promontory, some 30 m. out from the present shoreline, is a neat line of poros blocks about 12 m. long; beyond this, and to the south, is an area thickly sprinkled with poros blocks in apparently random positions but suggesting a pavement, about MSL —2.00 m.

Directly off the point itself is a heavy foundation 3.00 m. wide and preserved for a length of about 16 m., running almost due east and west. At its western end it seems to make a corner, and a short stretch of similar masonry 2.70 m. wide runs 2 m. northward. Other lines of masonry are visible, but are even less intelligible. One runs, about 1.00 m. below the surface, a little east of southward for a distance of 18 m. An abortive effort was made to examine this, frustrated by the fact that it is set in an extremely hard thick macadam pavement of fine white poros chips, sand and lime. It continues for a distance of some 14 m. in an uneven line of poros column drums, ranging around a meter in diameter and standing on end.

These remains carry us almost 50 m. south of the tower on the promontory, well out onto the northeast mole. The mole itself (Fig. 1) is built, like the southwest mole, of masses of broken stone and earth, but has no visible traces of masonry finish. Moreover, the broken rock on the whole seems to be in larger chunks than the broken rock on the southwestern mole, and there is perhaps a smaller proportion of earth to stone. It continues with a broad flat top some 25-30 m. wide for a distance of 110 m. south of the tower on the promontory. Here it comes to a relatively square end, and at the southwest corner of this, at the entrance of the harbor, about 2 m. below the surface, there is a huge block of poros stone some 3 m. long. There are two other blocks not quite so large close to it. These are all worn and obscured by sea growth, but there does not seem to be any particularly meaningful significance in their present juxtaposition. They must, however, represent a structure of some magnitude, though they may be only an obscure part of its foundation.

#### THE HARBOR FRONT OF THE NORTHEAST PROMONTORY

It has been observed that the structures lying on the ridge of the promontory running down along the sea are separated from the harbor area to the west by a road and a heavy concrete wall. The wall was apparently built quite late in the history of the site, but the general line of demarcation seems to have existed for long. The area on the harbor side of the line was investigated only by means of two trenches, 20 m. apart, running east and west (Figs. 1, 12). These give some suggestion as to the character of structures in a triangle marked by grid points 2413/14745, 2435/14715, and 2475/14745.

In the northern of these two trenches, at grid point 2432/14745 there was encountered a large vaulted drain built of concrete, some 0.50 m. wide and 1.20 m. high on the interior, running down into the harbor on a bearing a little west of south. East of the drain was a tangle of walls representing a long period of use, repair and replacement. In general, the walls are well made, of good poros blocks (Pl. 51, c). Most seem to rest on foundations or footings including some amounts of cement or concrete. Around grid point 2450/14740 there were found traces of a floor made of small pebbles in fine hard cement, such as was used for cisterns and houses in early Roman times and before. In several places on the lower part of the slopes there were found remains of a pavement of small cobbles or large pebbles set in a hard packing of earth and cement (Pl. 51, c).

West of the drain, close to the present shore of the harbor, there was found a long stretch of an almost unbroken surface of packed earth, gravel and ceramic debris, only a few centimeters above modern sea level (Pl. 51, d). No serious effort was made to dig below this level.

## AREA E — THE NORTH SIDE OF THE HARBOR

The middle of the north side of the harbor was examined tentatively in the summer of 1963 by a trench running from grid point 2330/14800, about 50 m. south-east (Figs. 1, 13, Trench 1). The northwest end is about 50 m. inland from the present shoreline; the southeast is about 15 m. from the shore. Throughout most of the extent of this trench there was encountered at a level of 0.30 to 0.50 m. above modern sea level an expanse of beaten earth, gravel, and fine broken ceramic debris, heavily discolored as though by burning, much like that found close to the shore in the western extremities of Area B described immediately above (Pl. 52, a). No serious effort was made to dig below this level, in view of the heavy flow of ground water.

The trench exposed scattered sections of several stretches of rubble walls or foundations, of relatively slight construction, and apparently fairly late in date.

At the end farthest removed from the sea, however, were encountered two parallel lines of heavy poros masonry, made of blocks well cut and well laid, some 0.90 m. thick (Pl. 52, b). The poros walls rest, apparently, on rubble foundations or footings. About ten meters to the west, in the sides of a large open well, are visible similar walls, quite probably parts of the same building. The walls themselves run on a line with a bearing about  $7^{\circ}$  south of east, or—if they may be considered to represent a building facing on the sea—looking about  $7^{\circ}$  west of south. The floor level may be represented by a surface of beaten earth about the level of the bottom of the highest preserved course of poros, or about MSL +1.00 m. On the floor lay quantities of broken roof tiles with signs of burning.

Immediately in front of the southernmost of this series of walls runs what looks like a shallow open drain cut in poros blocks. It lies below the level of the top of the foundation, and even seems to have a slightly different orientation.

Approximately along the line of the well built poros foundation there exist in the fields two small elevations, and there are two others close by. These were not excavated, but were examined from the surface, and appear to consist of heaps of small stones thrown over the ruins of small buildings with walls of small stones and mortar. The people of the village say that they have heard from their fathers that the buildings were customs houses of Turkish times.

Farther inland, about 80 m. from the beach, a trench was dug from grid point 2380/14830 extending some 30 m. slightly south of east (Figs. 1, 13, Trench 2). This was dug to ground water at a depth of about 3.00 m. below the surface, or about 0.60 m. above sea level. Close beneath the surface were remains of a late classical or early Christian building, including one room with a floor well paved with tiles (Pl. 52, c). At the deepest levels there were revealed some small sections of fairly good masonry imbedded in earth containing pottery of the Hellenistic period (Pl. 52, d).

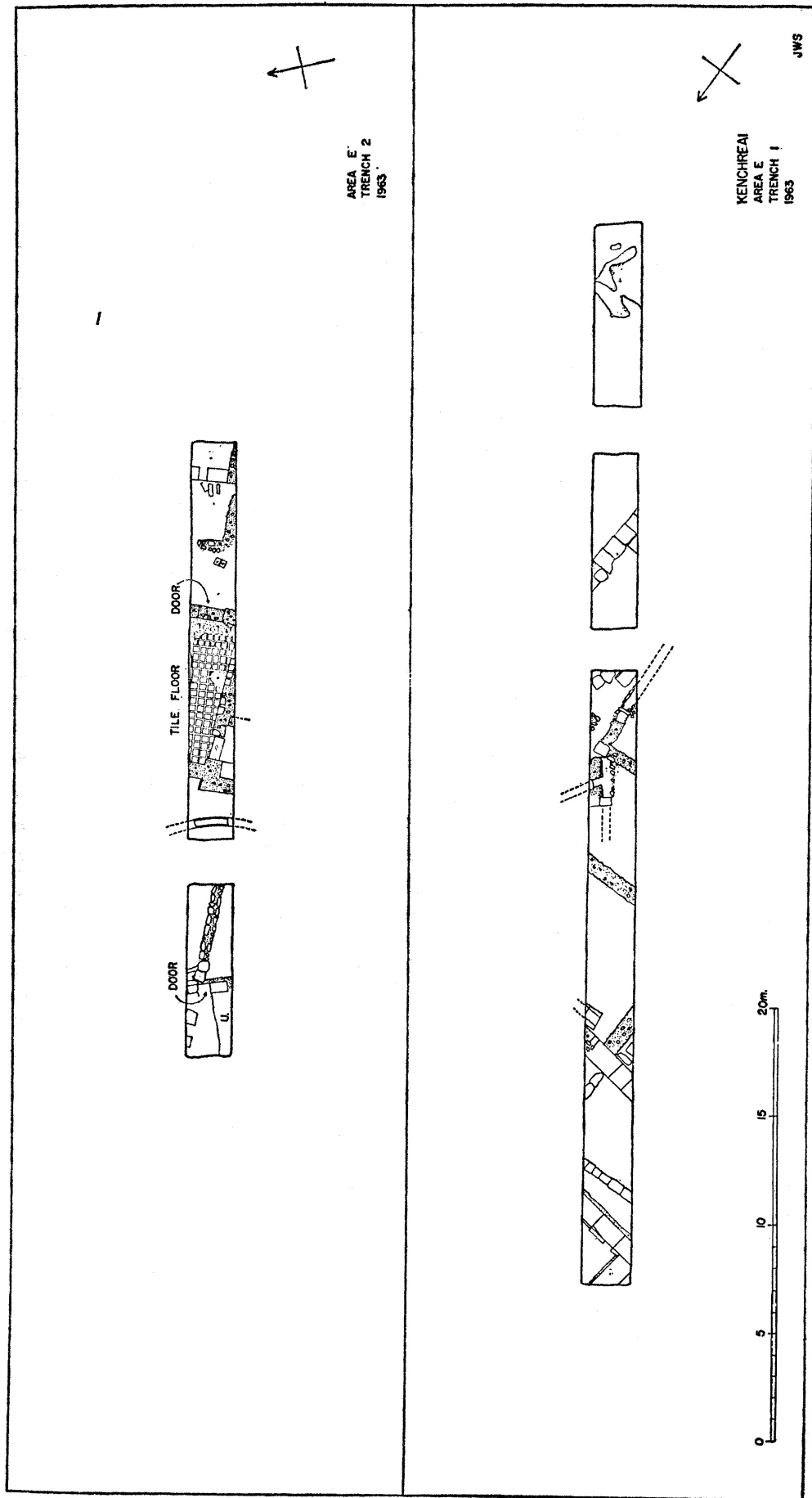


Fig. 13. Area E, Trenches off North Side of Harbor

## AREA B—THE NORTHWEST CORNER OF THE HARBOR

Excavation on and behind the shore at a point just west of the center of the ancient harbor (Figs. 1, 14) gave evidence of a commercial area dating in its most significant period from Roman imperial times. In the shallow water just off shore a line of carefully laid poros foundations was traced for some 45 m. running roughly parallel to the shore. These are perhaps related to the foundations similarly oriented which stretch across the east ends of the trenches some 12 m. to the northwest. It is as yet, however, impossible to say what the foundations in the water represent.

Clearing of the beach revealed a variety of foundations and hard packed surfaces apparently representing different periods in the development of this area. At the north end of the excavated beach near the shoreline and approximately parallel to it is a section of rubble wall 4.70 m. in length. This is sea-washed and in its present condition without any related walls or structures. Behind this to the west is a series of superimposed surfaces that represent a quai, or road, or both at different periods which fronted the shore. The lowest and so the earliest of these is 0.14 m. thick and is composed of a hard gray clay. It lies directly on the sand. Above this is a cobblestone pavement 0.11 m. thick in which a coin of Constantine came to light. The next surface is hard and compacted and resembles road metal. This is also 0.11 m. thick. The top level which is 0.12 m. thick and stretches back to the front of the trenches also appears to be road metal.

The most substantial architectural remains on the shore are the rubble foundations of an apparently late structure lying at the north end of the excavated area. This measures 7.00 m. on its northeast-southwest axis and probably faced the water, although we cannot be certain on this point since its southeast side has been washed away by the action of the sea. The foundations enclose three blocks of an earlier wall which appears at right angles from under the northwest foundation in the north one-third of the building. Immediately outside the northwest corner of this structure a horde of bronze coins was discovered cached against the foundation. Tentative identification of a few of the better preserved of these points to a date in the late fifth or sixth century after Christ for the deposit.

At a distance of 1.82 m. to the southwest of these foundations is a section of a large drain 0.72 m. wide that has also been traced in the east end of the north trench. The southeast extremity of this drain has disappeared because of its proximity to the water.

About 2.30 m. to the southwest of the drain is the first of four amphora necks that were found embedded upright in the gravel of the beach. Three of these lie in a line roughly parallel to the shore at distances of 1.45 m. and 3.75 m. from one another. The fourth piece is located 0.40 m. inland from the center piece. What purpose these served it is difficult to say. It seems possible, however, that these might have served as sockets to support poles holding up awnings or light roofs of establish-

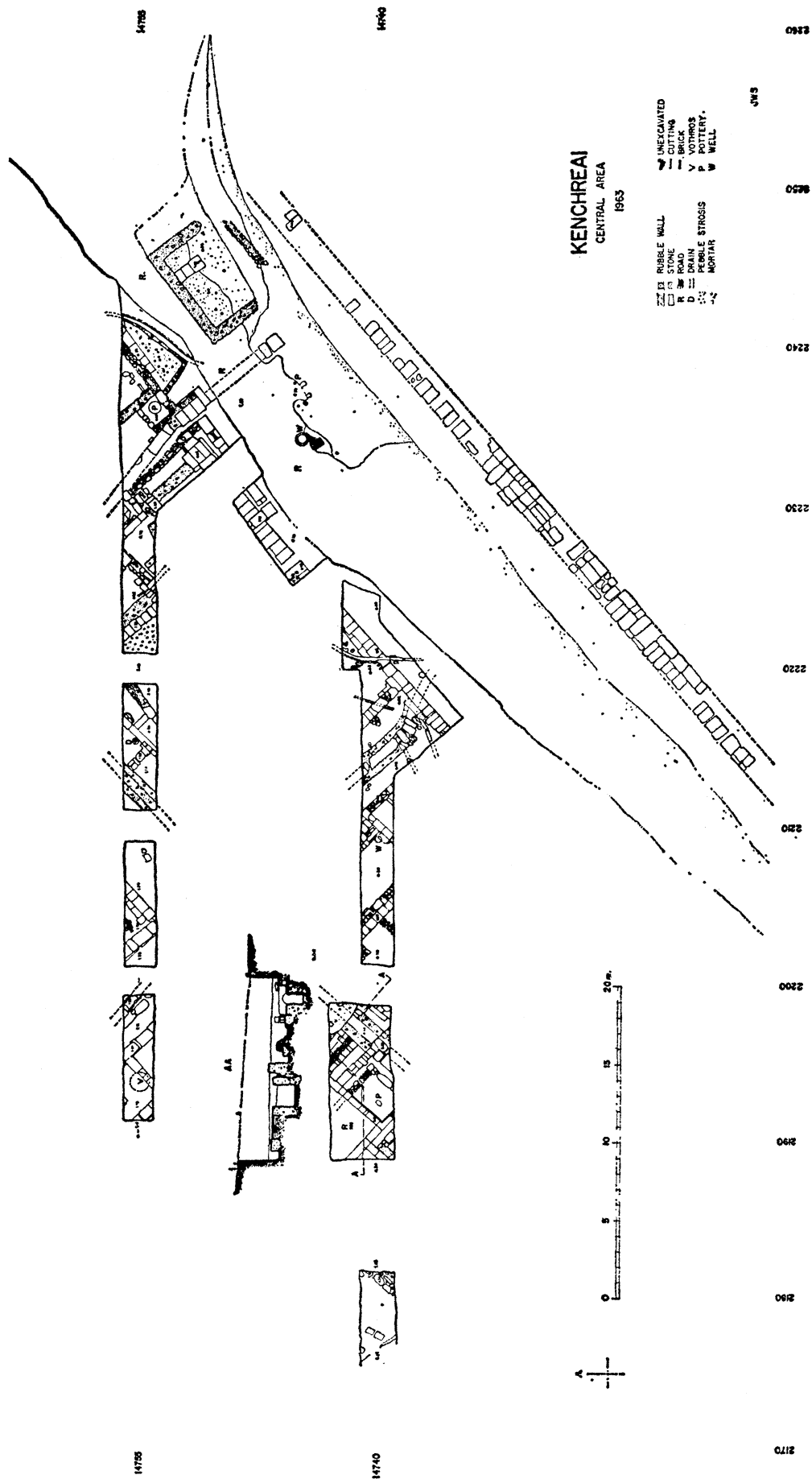


FIG. 14. Area B, Trenches at Northwest Corner of Harbor.

ments fronting the harbor. A well associated with a floor of diamond shaped bricks and oriented with reference to two of these amphora fragments (Fig. 14) suggests the possibility of a waterfront tavern.

In the trenches to the west is a complex of foundations and drains which show many modifications. The drain discovered on the shore appears out of the north side of the north trench at its east end. After 4.60 m. it changes its direction a few degrees to the south and after another 2.90 m. disappears under the road before appearing again on the shore. Although the context in this part of the trench is complicated and confused by extensive building and rebuilding, a hard surface was traced above the poros blocks covering the drain, suggesting by its presence a road or passageway.

A similar drain running in roughly the same northwest-southeast direction lies in the east end of the south trench. This is 0.59 m. wide and has been traced for some 4.20 m. from where it appears out of the north side of the trench to where it changes its course and passes with a northerly sweep under the line of foundations at this end of the trench. Clear evidence of a road was found above this drain.

A section of a third large drain crosses the east end of the central section of the south trench in a direction approximately at right angles to the lines of the two drains already mentioned. This is 0.62 m. wide and 1.30 m. high. It too was covered by a hard surface that could represent a road. A number of coins found in close proximity to this surface suggest a date for it in the fourth century after Christ.

Yet another section of a large drain came to light towards the west end of the second section of the north trench. This is 0.52 m. wide, and its position and northeast-southwest direction show that it is related to the drain last mentioned above. This drain also is covered by an extremely hard surface that is clearly road metal.

These drains and associated roads serve as boundaries on three sides of an approximately rectangular area with the shore road forming the southeast side of this rectangle. The poros foundations that have come to light in the trenches all appear oriented with reference to these roads and drains. Within this area it is perhaps possible to see a single structure, the southeast foundations of which have been traced for 20.20 m. across the east ends of the trenches. The northeast and southeast corners of this structure lie within the rectangle about 1.50 m. from the drains. In their northeast third these foundations are overlapped on the shoreward side for 6.50 m. by a series of less carefully laid foundations 7.70 m. long. In the wall running back from the southeast corner parallel to the drain and road in this quarter is a poros block with the symbol  $\square$  inscribed on its southwest face (Pl. 54, b).

What may be other parts of the foundations of this structure appear farther to the west in the north trench. Part of what may be the northwest or back wall is evident in the foundation with vertical drainpipe attached which runs parallel to and 2.00 m. southeast of the road uncovered in the second section of this trench. The higher stone in this foundation has a pattern incised on its southeast face which gives

the blocks the appearance of being two rows of smaller blocks laid in three courses (Pl. 53, a). Traces of the foundations of inner walls for this building may be seen in the block set at right angles to this foundation on its southeast side and in the well laid poros blocks also running in a northwest-southeast direction which appear towards the west end of the east section of this north trench. It is perhaps worth noting that when this foundation is projected on its present line to the southeast it intersects with the southeast line of foundations at the end of the overlapping foundation. In this same section of the north trench about 3.70 m. to the east of the poros foundations just mentioned the large block which appears in the north side of the trench suggests a dividing wall lying on a northeast-southwest line. The regular blocks which appear here immediately to the east may be part of the foundations of the northeast side of the structure.

The remains, then, suggest a building extending some 20.20 m. along the shore road fronting it and stretching back from it for a distance of between fourteen and fifteen meters. Traces of interior foundations suggest as well that this structure was divided on its northeast-southwest axis into two rows of four rooms each with one row facing the shore road and the other facing the road behind.

Other remains in the trenches suggest that similar structures existed on at least two sides. The fact that the front foundations extend to the southwest beyond the drain and road points to the presence of another similar structure with the same orientation here to the southeast. Traces of what may be the juncture of an inner dividing wall and the northeast side of such a second structure appear just to the west of center in this first section of the south trench, while a section of another interior foundation may be in evidence in the poros foundations lying some five meters to the west.

In the next section of this trench there is a confused mass of remains, but among these are what appear to be the foundations of a third substantial structure lying along the northwest side of the drain and road already noted as running across the east end of this section. What appears to be a corner of this same building made by its northeast side and an interior foundation wall came to light in the westernmost section of the north trench. The substantial foundations in the next section of this north trench (Fig. 14; Pl. 53, b) seem to be the southeast corner of yet another large structure which lay on the northwest side of the road. Whether such structures lay to the northeast it is impossible to say.

The size and depth of the foundations and the great number of roof tiles found in the vicinity suggest large structures. The plan of the buildings, the general lack of anything in the way of floors or superstructure that could be termed monumental, and the scarcity of objects of artistic merit suggest a commercial area. The area, then, would appear to have been covered by a series of warehouse units stretching along the shore and lying at least two deep behind it. These units fronted on a main



shore road and were separated from one another by roads laid out roughly in a grid pattern.

The ample evidence of building and rebuilding throughout this area suggests a long period of habitation. This is indicated as well by the pottery and coins found in conjunction with the remains. Although excavation at the lower levels was not extensive, mainly because of water seepage, enough Greek and early Roman pottery was found to indicate early activity. The pottery in the succeeding levels extends well into Byzantine times. The coins that have undergone preliminary study suggest as well that activity was at its height here during the fourth or fifth centuries after Christ.

### AREA G—THE HILL ABOVE THE HARBOR TO THE NORTH

On the hill behind the harbor excavation revealed Greek remains mainly of the fourth and third centuries B.C. and gave indications of earlier habitation here (Figs. 1, 15). Because the soil was shallow, seldom exceeding a meter in depth, it was possible not only to clear a major portion of the south end of the hill, but also to form a good impression of the nature and extent of the remains farther back.

In the north half of the excavated area (Fig. 15) there was abundant evidence of quarrying. This together with information derived from two additional probes some fifteen meters and fifty-five meters farther back made it clear that the whole hill, except for its southern extremity, had been the site of a quarry in ancient times. Over much of the area the outlines of the quarried stones were incised in the rock cap showing that the average size of the blocks as they were cut out was 1.50 m. x 0.75 m. Seven small holes were scattered over the excavated surface, perhaps to serve as emplacements for posts supporting the winches that would be needed to lift the blocks. Along the southeast side and end of the excavated area quarry chips were apparently filled back over the rock. The only evidence that the quarried area was subsequently inhabited consists of two slight walls related to a rock slab floor and tile drain. There is no reason to think that this represents a systematic reoccupation of the area.

The investigation of three large cavities, apparently naturally formed, revealed remains which suggested occupancy, perhaps by those who worked the quarry. The two hollows at the extreme north end of the main north-south trench contained some Greek pottery and traces of walls. The more southerly of these two cavities contained a wall built under the rock cap forming its northwest side, evidently to support the overhang.

The third hollow is located some 6.50 m. to the west of the main trench also in close proximity to the quarry. On the floor of this, about three meters below the surface, two small hollows (one lined on two sides with tiles) and evidence of fires in conjunction with animal bones together suggested an area of simple habitation. In the Greek pottery which made its appearance here was a black-glazed piece, perhaps part of a plate, with the letters ΔYON scratched on its underside (Pl. 54, c).

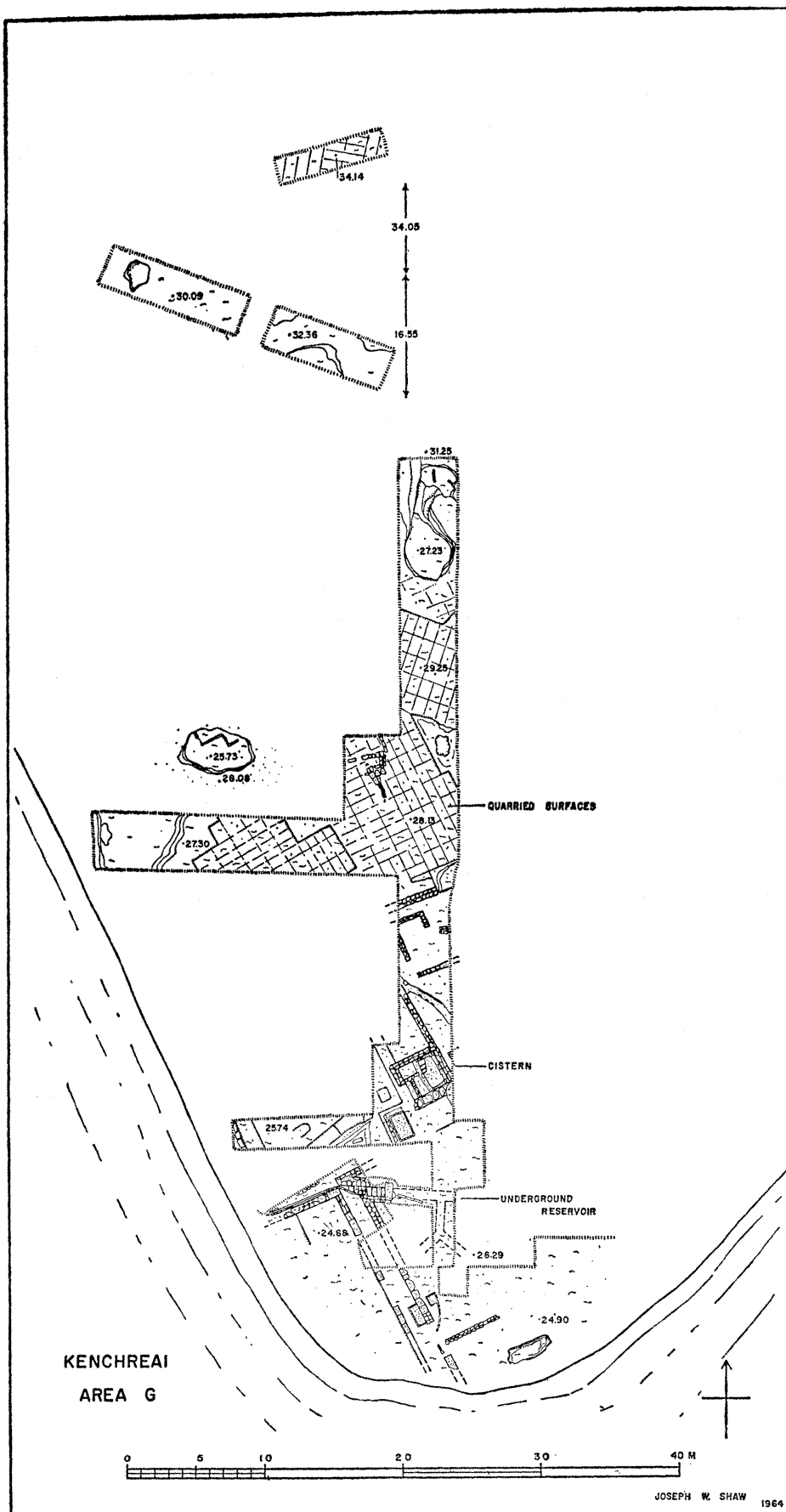


FIG. 15. Area G, Trenches on Hill North of Harbor.

Along the southerly edge of the quarry as it was excavated a large deposit of Greek pottery came to light. Most of it was coarse ware but a number of terracotta figurines, two of the fifth century B.C., were found here. At first glance this extensive deposit, which seems to extend to the west in the area not excavated, appears to be a dump and may come, at least in part, from structures that were removed for the quarrying.

Over the south edge of the quarry in the main trench lies a series of foundations which represent the north side of a building that extended over the whole area between the quarry and other structures on the extreme south edge of the hill. The most northerly foundation here, which rests on the bedrock and crosses the trench in a direction from northeast to southwest, evidently served as the enclosing wall on this side of the building. This, together with the less substantial wall immediately to the south, seems to form a corridor that opens out into a partially excavated interior room. Immediately to the south there is another room measuring 3.85 m. on its northwest-southeast axis with an entrance in its southwest corner.

In the next room to the south embedded in the yellow clay floor are the remains of a drain which meanders in a general northwest-southeast direction. A few stones of each side of the drain are *in situ* so that its average width may be calculated to be about 0.52 m. Where this drain disappears into the west side of the trench another substantial foundation appears running for some 7.40 m. in a southeasterly direction across the trench south of the drain. This is preserved at various points to heights between 0.35 m. and 0.65 m. and is made of unworked stones of medium size carefully laid side by side in two rows to give it a width of 0.43 m.

At its southeast extremity it forms the northeast wall of a room 2.60 m. by 2.83 m. which is divided in its southwest half by slight walls into three small rooms, while in its northeast half is a cistern. The cistern (Pl. 53, c), measuring some 2.15 m. by 1.13 m. on the inside of its upper rim, varies in depth from 0.98 m. to 1.40 m. There are three steps leading to the bottom of it at its northwest corner. The interior is completely lined with a fine yellowish clay which extends up and over the edges on the northwest, northeast, and southeast sides to form ledges averaging 0.17 m., 0.25 m., and 0.17 m. in width respectively. The walls above the ledges on these three sides are similarly plastered. The lining is carried over the southwest side as well, although there is no wall here. At all four corners of the cistern on the ledges and at the midpoints of the long sides are small well-squared blocks of poros stone which would appear to be supports for a large cover also made of stone or, perhaps more likely, of wood. At the northwest corner two smaller blocks set together serve the purpose of a larger one. The interior one of these appears to have been re-used, since there is a groove cut out of one corner which seems to serve no purpose here, unless the cover had a lug projecting from beneath it which when fitted into this slot would hold the cover stationary.

The cistern was apparently abandoned at a later period as a repository for water and was filled with debris which included a large amount of pottery and some bones. This debris would appear to have been deposited at one time since no stratification was evident. Among the more interesting pottery fragments were the heads of what may be pigs or boars which are reminiscent of similar, better preserved pieces in the museum at Sikyon.

The three small rooms already mentioned as lying southwest of the cistern were remarkable as containing almost no pottery.

About one meter to the southwest of this complex is a shallow clay basin measuring 2.05 m. on its northwest-southeast axis and 1.20 m. in width which was filled with a number of seashells and a variety of pottery. Its present depth is 0.05 m., although we may assume that it was certainly deeper from the fact that the tops of its sides are broken off all the way around and fragments of what were surely the sides were found in the immediate vicinity. The basin is sunk into the bedrock which borders it on the northeast and southeast sides while on the other sides are the remains of walls about 0.30 m. thick. A small drainhole passes out of the basin and through the wall at its northwest corner.

In the immediate vicinity of the cistern and basin are a number of cuttings that as yet cannot be explained. One of these lies about 1.15 m. to the northwest of the basin mentioned above in an area cut away below the level of the basin. Its shape and shallow depth suggest the possibility that it served as a basin. There is, however, no evidence that it was lined. The clay-lined basin, the cistern complex, and the rooms to the north seem to form a related whole and leave the impression that we perhaps have a fulling establishment.

What the relationship was between this establishment and the remains to the south it is difficult to say. The general appearance of the remains, however, seems to suggest that the structures on the south end of the hill were separate from the fulling establishment. However this may be, the remains on the south seem to divide naturally into three parts: a rock-cut cistern, traces of a building to the southwest, and traces of another building to the southeast.

About 13.50 m. from the south edge of the hill is a large rock-cut cistern which runs in an approximate east-west direction. Its entrance (Pl. 53, d) consists of a flight of 17 shallow steps about 0.65 m. wide, the middle step of which forms what appears to be a platform. The stairs lead to a well plastered chamber with an arched ceiling which extends about 2.00 m. beyond the foot of the stairs. This chamber is 1.84 m. high and slightly wider than the stairs. At the east end on the floor tight to the wall on all three sides is a well squared plaster covered stone which rises 0.32 m. above the floor and projects 0.40 m. from the east end of the chamber.

On the south side of the chamber, about 0.72 m. from the east end a slightly narrower branch chamber extends to the south. Four stairs lead down from the main

chamber to the floor here which is a meter lower. This branch chamber is of about the same height as the main chamber and extends 2.25 m. to the south before it in turn branches to the southwest and southeast. These two sections were investigated for about 1.55 m. and 2.10 m. respectively. This Y-shaped arrangement does not seem to have been plastered.

Directly above the platform formed by the middle step a large roof block spans the passage. It is cut in a curve on its underside to fit with the curved ceiling of the chamber which begins at this point. This block which measures 1.20 m. x 0.43 m. x 0.30 m. thick at its corners, abuts against and rises above the rock cap behind it to the east. At this point the edge of the rock cap behind the spanning stone seems to have been cut away to leave a hole leading into the cistern below. A substantial water conduit leads in the direction of this hole from the higher rock to the southeast. The tiles which cover this drain overlap one another in such a way as to suggest a flow of water from the southeast. The water dropped through the hole onto the stairway below hitting it at the level of the platform.

Another drain, this one uncovered and considerably smaller, may be traced (Fig. 15) from near the edge of the hill to the west, along the outside of the north wall of a building to the southwest, around its northeast corner and down the south side of the steps to the bottom of the cistern. This drain presents a problem since the fact that it goes down into the cistern suggests that it brought in water, while the natural flow of water in the drain where it appears outside would be away from the cistern.

It should also be mentioned that the entrance to the cistern was blocked by a wall neatly built on the fourth step. This apparently represents a remodeling.

The cistern contained a fair amount of pottery, but few objects of interest. Worth mentioning are a terracotta figure depicting a veiled woman leaning on a herm, found just below the capping block and from a lower level a black-figure sherd showing the head of an athlete.<sup>4</sup>

When we come to the extreme south end of the hill (Fig. 15) it is clear that constant erosion of the shallow soil and breaking away of the rock since ancient times has left an incomplete picture of the remains here. Of the building on the southwest extremity of the hill only the northeast corner and sections of the foundations of the northwest and northeast walls have been preserved to a height varying between 0.40 m. and 0.60 m. The construction of the latter wall at the corner is striking (Pl. 53, d) inasmuch as it is a carefully fitted polygonal masonry. The bedrock in this corner of the building has been levelled, apparently after or at least in connection with the laying of the foundations so that these lie on the rock higher than the levelled area with the faces of the two cuttings flush with the wall faces. The northwest wall is preserved for some 4.45 m. and presumably extended out beyond

<sup>4</sup> *Archaeology*, XVIII, 1965, p. 194, bottom fig.

the present west edge of the hill some 2.94 m. beyond. How far it went, we cannot say. About 3.60 m. from the northeast corner a small plastered drain hole penetrates this wall. This appears to be related to a cutting in the rock which runs from this point at right angles to the wall in a southeast direction for 2.52 m. The face of this cutting is also plastered.

The foundations of the northeast wall of this building have been traced for some 14.50 m. through blocks and cuttings which run off the south edge of the hill. Evidence that it extended considerably farther in this direction is to be found in the cuttings on the masses of stone which have broken away from the hill and now lie on the slope below it. Traces of the floor of this building were evident in a clean yellow clay that was found evenly distributed inside the northeast corner. A number of Hellenistic Greek coins were found on and in this floor as well as on the bedrock immediately below.

Between this southwest building and the second structure lying along its northeast side is a passageway which measures 1.15 m. in width at its beginning near the entrance to the rock cut cistern and gradually widens to 1.35 m. where it disappears at the south extremity of the hill.

The wall which lies along the northeast side of this passage, as has been indicated above, marks a side of a second substantial structure, the interior of which stretches to the northeast. This wall, if we take it as beginning at the south side of the entrance to the reservoir, may be traced for 16.30 m. before it disappears over the edge of the hill. As with its counterpart to the southwest, we may assume that this wall and the building associated with it stretched some distance farther to the southeast over part of the hill that has broken away.

The interior arrangements of this southeast building are not at all clear since much erosion has disturbed and destroyed its remains. On the interior side of the wall mentioned above, at about four meters from its south end a second wall runs at right angles in a northeasterly direction. This has been preserved for 4.34 m., and its composition reminds us of the walls in the fulling establishment to the north.

Throughout the undisturbed area of the building was a clean floor of yellow clay. When this was excavated to bedrock a basin was found cut into the bedrock some 2.75 m. northwest of the interior wall of this building and 0.30 m. northeast of the other wall. It is oriented in the same direction as these walls, is lined with clay, and measures some 0.60 m. x 0.70 m. In its northeast corner is a round hollow area while a drain running from its southeast corner gradually curves away in a southwesterly direction for about 1.80 m.

The broken edges of the clay around the basin and the fact that the clay side has been preserved to a height of 0.20 m. at the northeast corner behind the hollow suggest that the clay lining at one time extended upwards to form sides. Another basin similarly lined and with the same orientation but quite different in shape lies

about 0.80 m. to the southwest of this in the passage noted above. The wall at this point is built through this basin leaving a width at the north end of 0.75 m. and 0.065 m. at the south end. It is 1.60 m. long on its upper edge, 1.36 m. on the bottom and 0.40 m. deep. Evidently the basin precedes the wall in time.

The relationship between the rock-cut cistern and this building is not yet clear, but a glance at the wall construction around the entrance to the cistern suggests that the latter was incorporated into this building. Perhaps when this incorporation took place, the entrance to the cistern was blocked and the drain running out of it to the west was built.

At the extreme south edge of the hill a large hollow was cleared. Nothing was found to indicate that it was ancient in origin and use.

Although it is premature to say anything final about the chronology of the remains in this area, a few tentative general observations may be made. There is no certain evidence of Roman occupation. In fact, all indications are that the remains all date from Greek occupation before the middle of the third century B.C.

Perhaps the earliest structure on the hill is the rock-cut cistern. This is indicated by the fact that its orientation is different from the other structures and by the black-figure sherd of the fifth century B.C. found in the fill inside the cistern.

That structures existed on this hill in the fifth century B.C. is suggested as well by two terracotta figurines of the fifth century found in the debris on top of the quarry. These also give us a general *tempus post quod* for the quarrying and together with a coin of Sikyon found on the floor of the stoneworkers' quarters in the hole to the northwest suggest that the quarrying might have taken place in the first half of the fourth century. Other coins in the fill over the quarry tend to bear this out.

The fulling establishment, inasmuch as in its northern extremity it overlies the south edge of the quarry, appears to have followed the quarrying.

As far as the two buildings at the south end of the hill are concerned, it would appear that they date from the latter half of the fourth or the early part of the third century. A coin of Megara dated to the period 307-243 B.C., found on the bed-rock beneath the floor of the southwest building, gives us some idea of a *tempus post quod* for the establishment of this building. Three coins of Demetrios Poliorketes, two in the floor and another immediately above it, suggest a similar date for the building on the southeast corner of this hill.

One of the most striking characteristics of the remains in this area is their general orientation. With the exception of the rock-cut cistern everything is oriented on approximately the same northwest-southeast axis. Much of the quarrying was carried out on the same orientation. What this suggests, it is difficult to say. It may be that the arrangement is indicative of a certain configuration of the terrain here in ancient times or of a pattern of roads that we have not yet discovered.

## AREA TA — THE STRUCTURE NORTH OF THE TOWN

The remains on the coast about a kilometer northeast of the harbor of Kenchreai proved upon investigation to be the foundations and podium of a monument from Roman times (Fig. 16; Pl. 54, a, d, e). The large poros blocks which constitute the single course of the foundations are set 0.20 m. into the bedrock and are laid in a square measuring 10.40 m. on the sides. On top of these foundations, ringing the podium, was a single course of marble 0.45 m. high, several blocks of which are preserved *in situ* at the northwest corner, at approximately the center of the west side, and at the south end of the east side. The positions of the latter along with the set lines for other blocks now missing or moved show clearly that the marble course was laid to form a square 10.20 m. on the sides, or slightly smaller than the square formed by the foundations below. The marble block *in situ* on the east side is 2.54 m. long, 0.92 m. wide, and 0.44 m. high. A number of other marble blocks which were probably part of this course were found scattered in the immediate vicinity of the foundations. The blocks of this marble course were bonded to one another and the blocks of the podium behind by bar clamps.

This podium which at present rises four courses above the foundations on the north, east, and south sides and three courses on the west is built of large poros stones, many of them joined with bar clamps. It rises to a height of 1.70 m. in the four courses and is 7.50 m. square. Investigation of the center of the podium revealed that it was not of solid construction, but that it was built around an elevation in the bedrock on top of which is a separate series of foundations (Pl. 54, d). The well-squared stones of the latter are smaller and better fitted than those of the podium built around them. In addition, they are joined by swallowtail clamps. These foundations are set into the bedrock which here is 0.50 m. above that in the surrounding area and rise in two courses on the north and west sides and one course on the other two sides.

The rectangle thus formed measures 3.80 m. on its east-west axis and 3.30 m. wide. The hollow enclosed by these foundations is 2.60 m. long and 2.00 m. wide. Within this area near the southeast corner is a hole cut in the bedrock measuring 0.16 m. in diameter and 0.25 m. deep. On the east side these inner foundations are tight with the inner line of the blocks of the podium, whereas on the north, west, and south sides there are spaces between this core and the podium varying from 0.30 m. to 0.50 m. in width that were filled with mortared stones. Where this mortared material was removed the outer face of the inner foundations was found to be coated with a thin layer of plaster. It would appear that two periods of construction are represented here with the rectangular core of the podium being the foundations for an earlier, smaller structure which were incorporated in the later more impressive square monument.

The tooling on the surface of the marble block preserved *in situ* towards the south end of the east side shows clearly that the course immediately above was set



0.31 m. back from the outer line of the first marble course. This probably represents the position of the first course of the marble facing of the podium.

Many blocks of marble representing various parts of the superstructure of the building were found scattered in the immediate vicinity. It is not yet possible to recon-

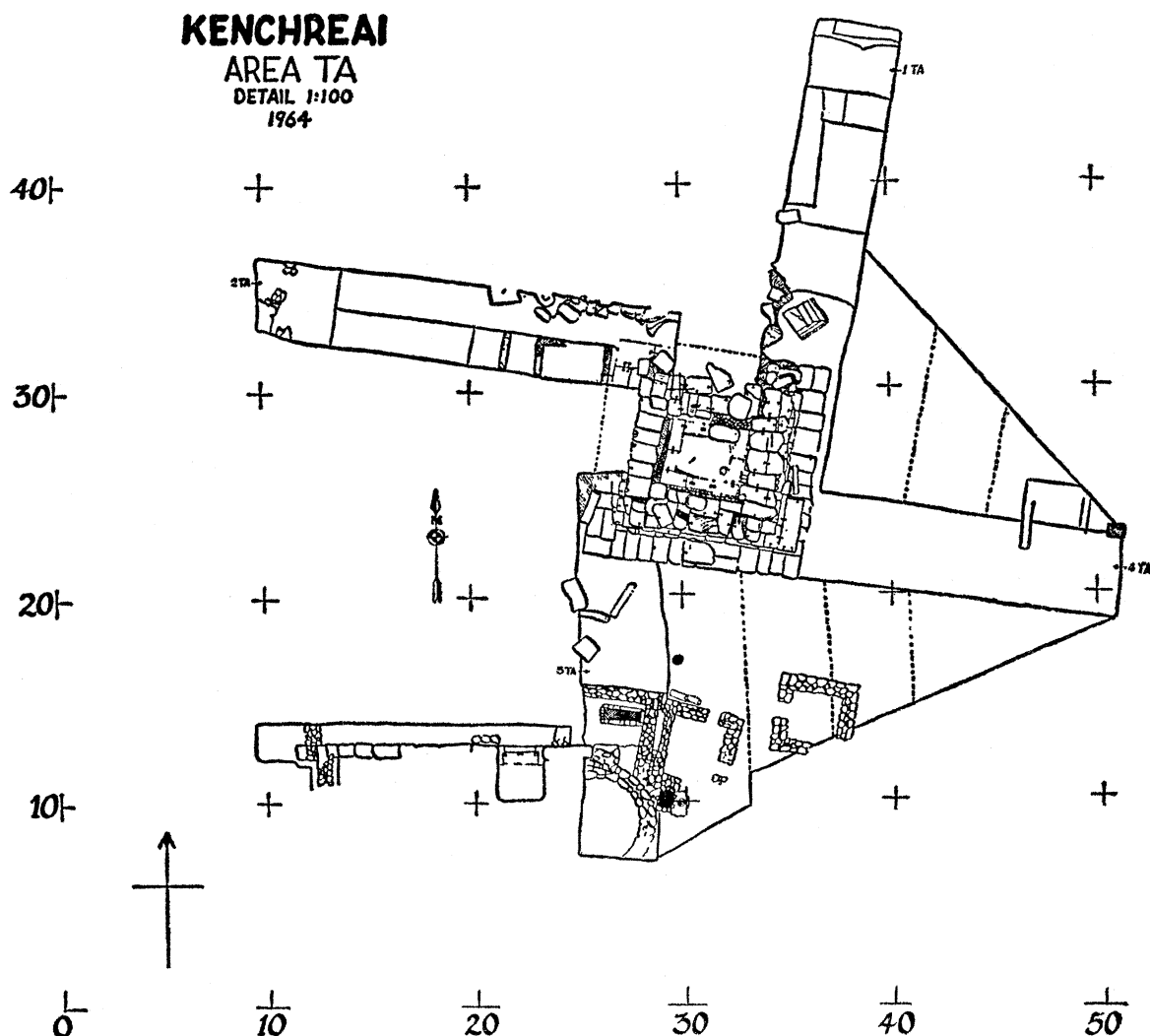


FIG. 16. Remains of Structure North of Kenchreai.

struct this monument, but in these pieces we perhaps can see marble facing, revetments, and even pilasters which together with the remains *in situ* represent parts of a large structure. Moreover, the presence of these kinds of pieces and the general absence of any remains of columns or capitals of a suitable size for such a structure suggest a solid, marble-faced structure without columns.

Considerable evidence of the sculptured members of the building has been found in the marble fragments, for the most part very small, of acanthus, guilloche, egg and dart, and bead and reel designs. A heavy guilloche design would naturally find a place as a combining member at the base of the wall of the superstructure immediately above the podium.

A little over a meter north of the northeast corner of the foundations of the building a corner block of the cornice was found lying upside down, apparently where it had fallen from the building (Pl. 54, e). On what is architecturally the upper surface of the block it measures 1.52 m. on the southeast side and 1.43 m. on the northeast side; on its lower surface it is 1.06 m. on the southeast by 1.00 m. on the northeast. It is 0.58 m. thick. There are five bands of varying design. On the face of the corona is a narrow and shallow leaf and dart design with a narrow unsculptured band immediately below. This design is only partly finished on the southeast side of the block which would face the north, if the block is to be put back in position at this northeast corner. A delicately worked acanthus design fills the curving cyma immediately below. This band is considerably wider than those above and below and forms the main decorative element in the cornice. In order below this on successively receding planes are bands of dentils, egg and dart, and bead and reel.

Extensive investigation around the remains revealed a shallow earth cover remarkably free of small remains where, at least in the immediate vicinity of the foundations, a destruction level lay directly on the construction level. In the bedrock in the trenches running to the west and north are cuttings which suggest a general levelling of the area through quarrying, perhaps for the blocks in the foundations and podium of the monument. At the extreme west end of the trench to the west at a distance of about 16.40 m. from the northwest corner of the foundations are the slight remains of a kiln. This together with the numerous small fragments of worked marble found around the foundations suggests the fate of most of the marble appointments of the monument.

Extensive clearing and levelling to the east brought to light a number of fragments of one or more Latin inscriptions. Because these fragments are small and few joins have as yet been detected, it is impossible to say anything except that the variety of letter sizes points to ten or twelve lines of Latin.

Also on the east side at about 10.45 m. from the foundations the west, north, and east sides of a structure measuring 3.40 m. on its north-south axis and 3.25 m. wide have been traced in cuttings in the bedrock. About a meter to the east of these is a rectangular hole 0.80 m. long, 0.60 m. wide, and 0.70 m. deep. A coin of the emperor Arcadius was found lying on the bottom of this hole.

Excavation and clearing on the south side of the monument brought to light a series of foundations that have not yet been adequately investigated. Some 8.50 m. to the south a wall has been traced running east and west and intersecting at its

west end with another running to the north and a third running to the south. In the line of this wall to the east is a fine marble doorway 2.08 m. in width and 0.86 m. deep. Holes in the threshold suggest that the doors were double and could be locked from the inside by the use of vertical bars. The opening through the doors was 1.53 m. wide.

To the east of this doorway are the mortared foundations of an apse with two rooms adjoining it to the north, all of them only partially excavated. In the excavated part of the west room is a grave cut into the bedrock floor to a maximum depth of 1.00 m. This measures 2.10 m. in length and is 0.59 m. wide on the west and 0.50 m. wide at the east end. The east end and floor are unlined bedrock while the north, west, and south sides are lined with clay. The edges of the grave are recessed 0.10 m. below the levelled bedrock floor of the room, thus leaving a lip 0.20 m. wide around the rim of the grave. A number of the tiles that were laid on this lip have been preserved *in situ*. Across the east end lies a white marble slab. Two others supplemented this to cover the grave. The contents of the grave consisted of the skeleton found at a depth of 0.60 m. and a few late Roman pottery fragments.

The partially excavated room immediately to the east of the room with the grave appears to have an opening for a doorway in its north side to the east of center. About 1.50 m. to the northeast of this room is another partially explored room or structure with an opening in its west wall.

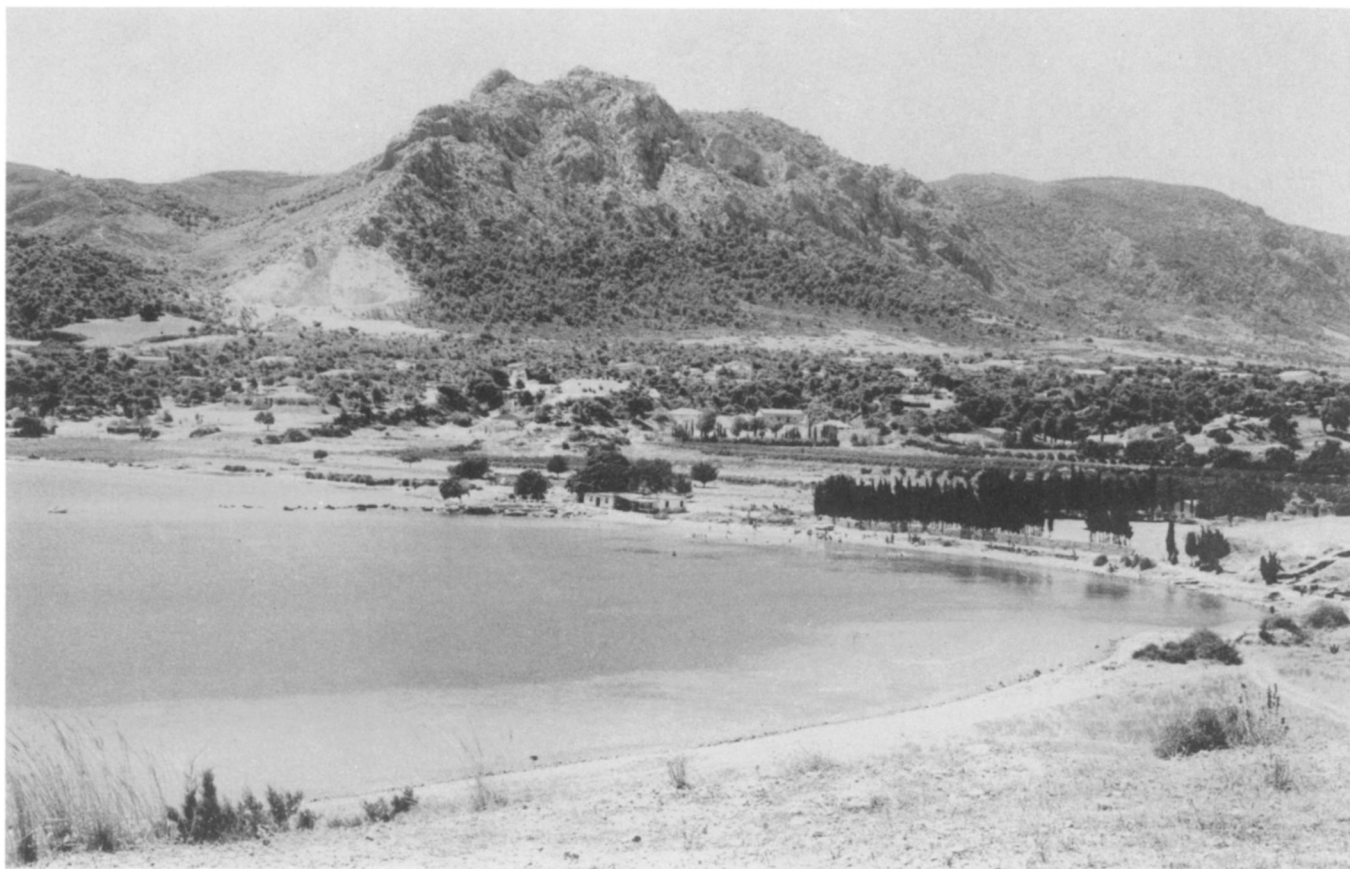
Immediately to the east of the apse on the south edge of the excavated area an ancient well, now dry, was investigated to a depth of 17 m. Thus far it has yielded little besides a few marble fragments and a few sherds of Roman and Byzantine pottery.

Between the south edge of the monument and north walls of the rooms excavated to the south a number of column fragments came to light. Two of these lie together on the west edge of the excavated area. One of them is fully excavated and measures 2.00 m. long and has a diameter of 0.25 m. Similar fragments found within and to the north of the rooms on the south suggest that these are associated with these structures rather than with the monument.

Little can yet be said with regard to the chronology of the remains in this area mainly because of the scarcity of dateable material. The majority of the pottery ranges from the first through the fifth and sixth centuries after Christ, although there were scattered finds from both earlier and later times. The few coins that were found seem to come mainly from the late fourth century or early fifth century after Christ. Two coins, however, from the first century after Christ made their appearance.

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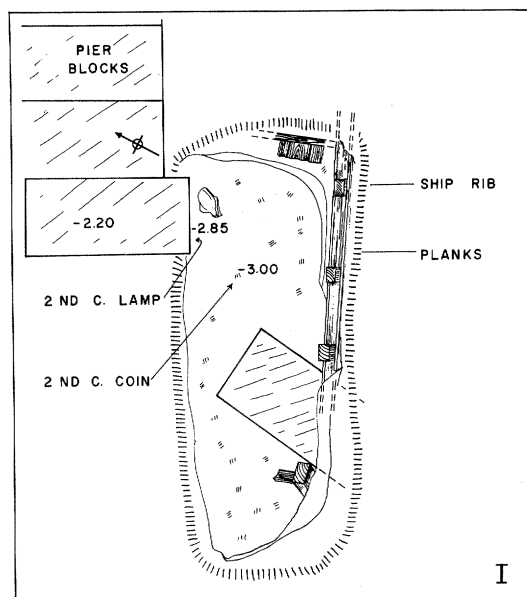
a. The Harbor, from the North Side



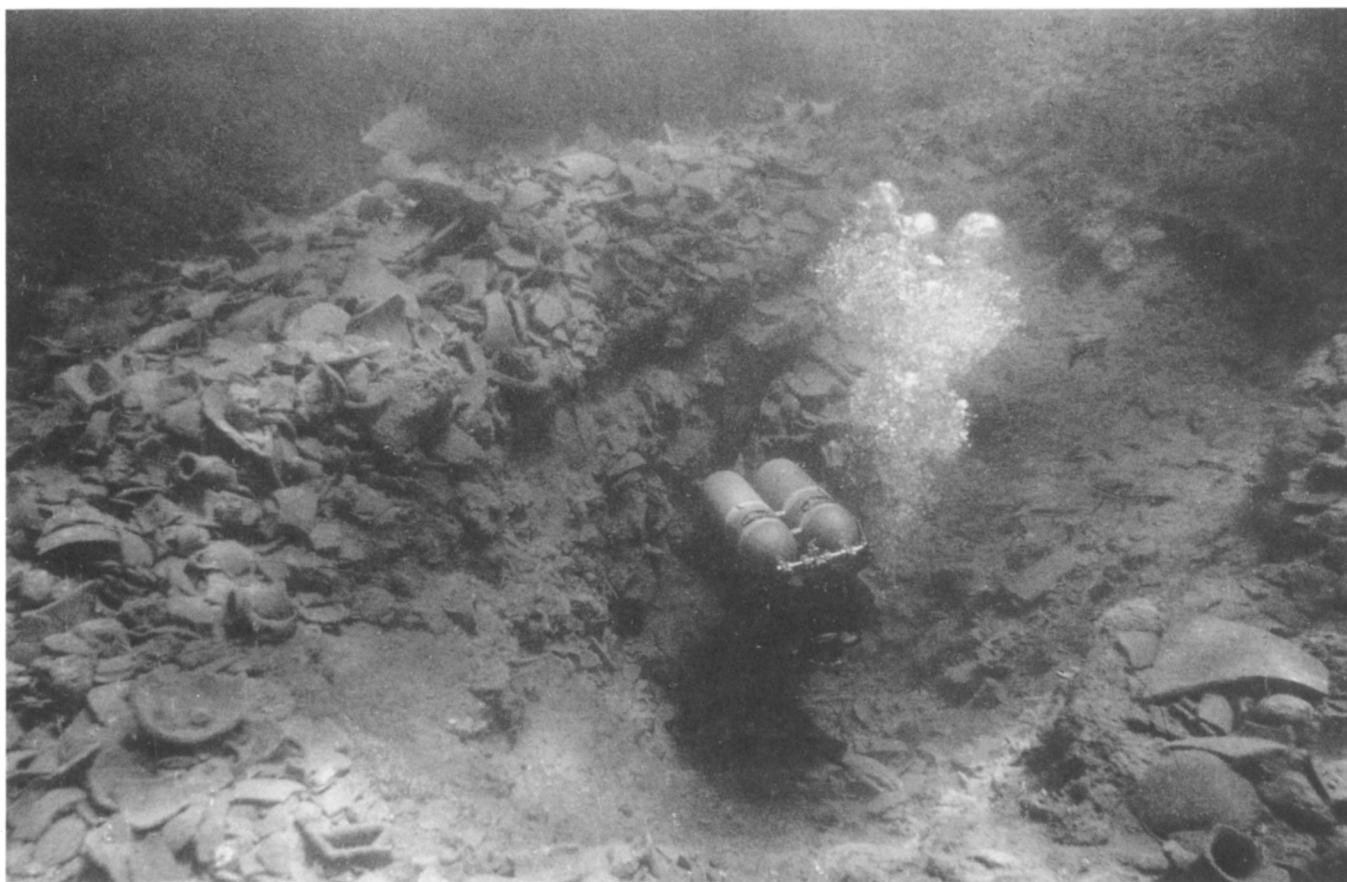
b. The South Pier, looking Southeast



a. Paved Surface, submerged



b. Remains of Boat



c. Trench in the Harbor Bottom

Area A, The South Pier

ROBERT L. SCRANTON AND EDWIN S. RAMAGE: INVESTIGATIONS AT CORINTHIAN KENCHREAI

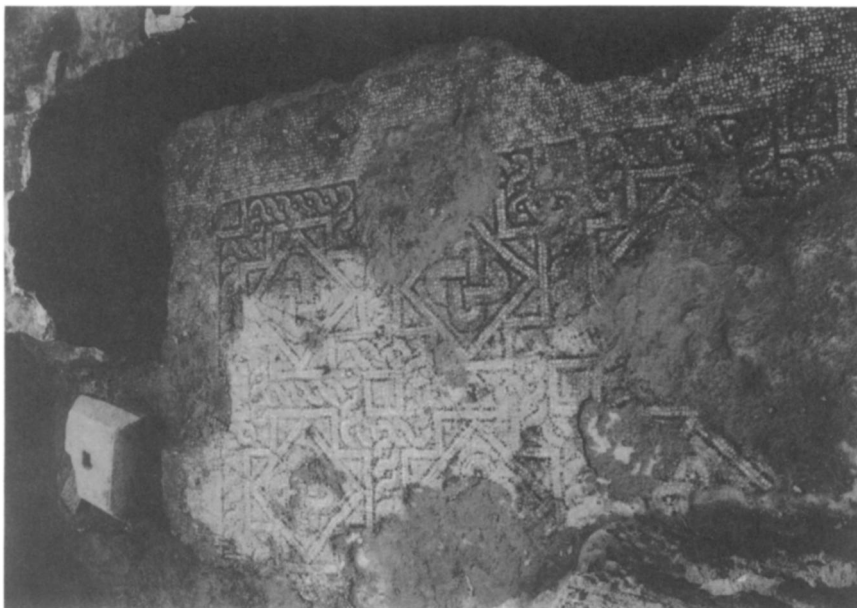


a. Central Unit, Remains of Rear Wall



b. Western Unit, Masonry in East Wall, Second Period

Area A, The South Pier, Warehouses



c. Western Unit, Mosaic

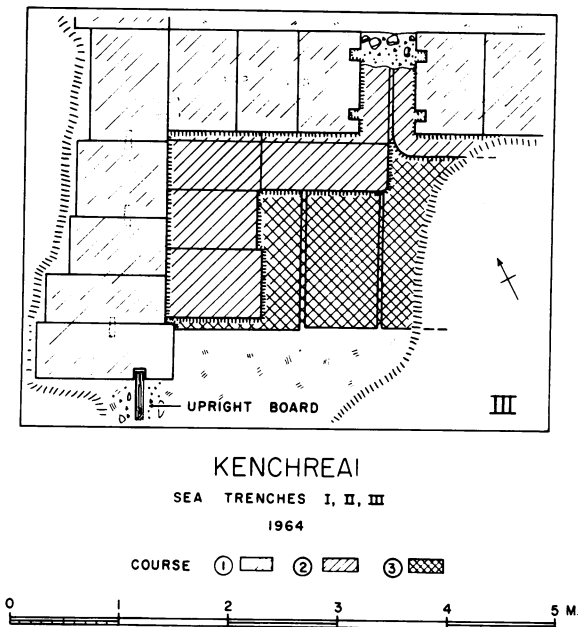




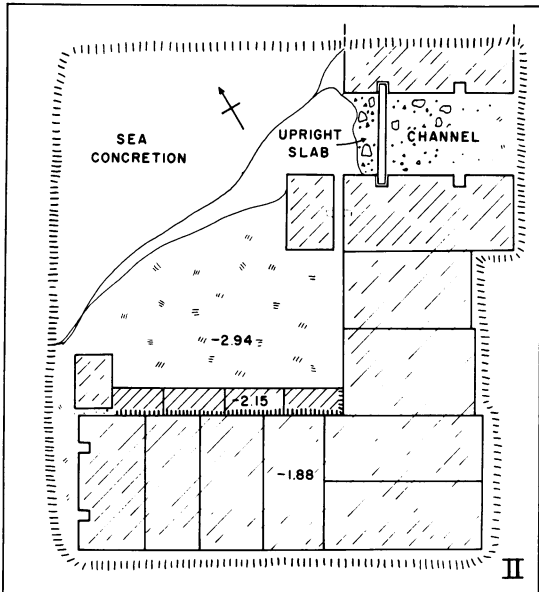
a. Passage, with Slots and Door Slab



b. Central Basin, Northwest Corner as Excavated



c. Central Basin, Northwest Corner



d. North Basin, Southeast Corner

Area A, The South Pier, "Piscina"

ROBERT L. SCRANTON AND EDWIN S. RAMAGE: INVESTIGATIONS AT CORINTHIAN KENCHREAI



a. Before Excavation

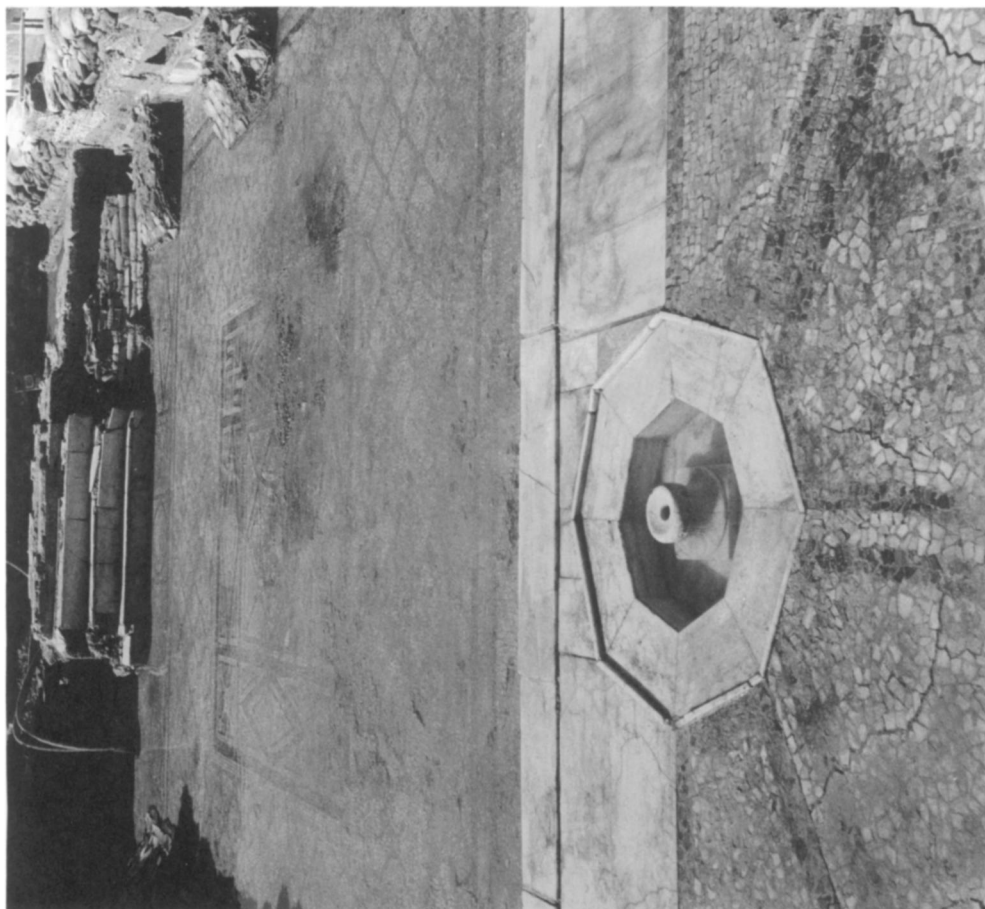


b. After Excavation, looking East

Area A, The South Pier, Sanctuary, Apsidal Building

ROBERT L. SCRANTON AND EDWIN S. RAMAGE: INVESTIGATIONS AT CORINTHIAN KENCHREAI





a. After Excavation, looking West



b. Crates of Opus Sectile along South Wall

Area A, The South Pier, Sanctuary, Apsidal Building

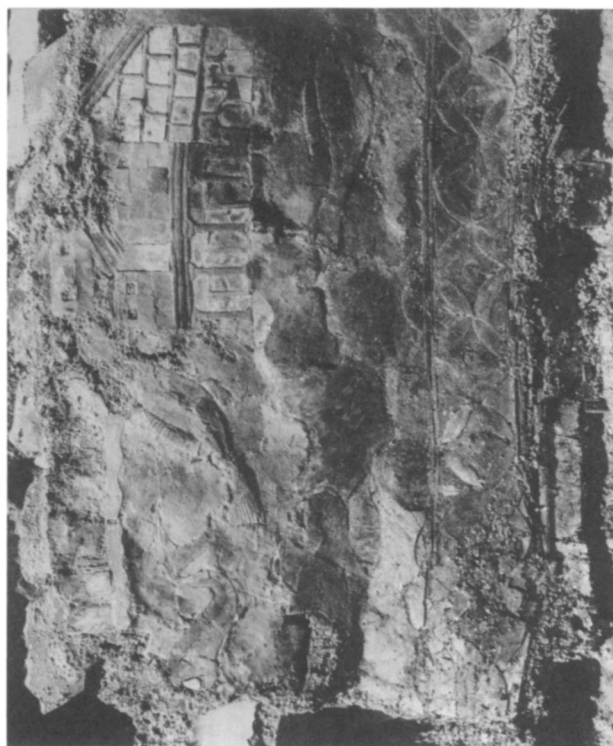
ROBERT L. SCRANTON AND EDWIN S. RAMAGE: INVESTIGATIONS AT CORINTHIAN KENCHREAI



a. Crates of Opus Sectile along North Wall



c. Crocodile with Legs of Human Rider



b. Panel of Opus Sectile, Buildings with Fish



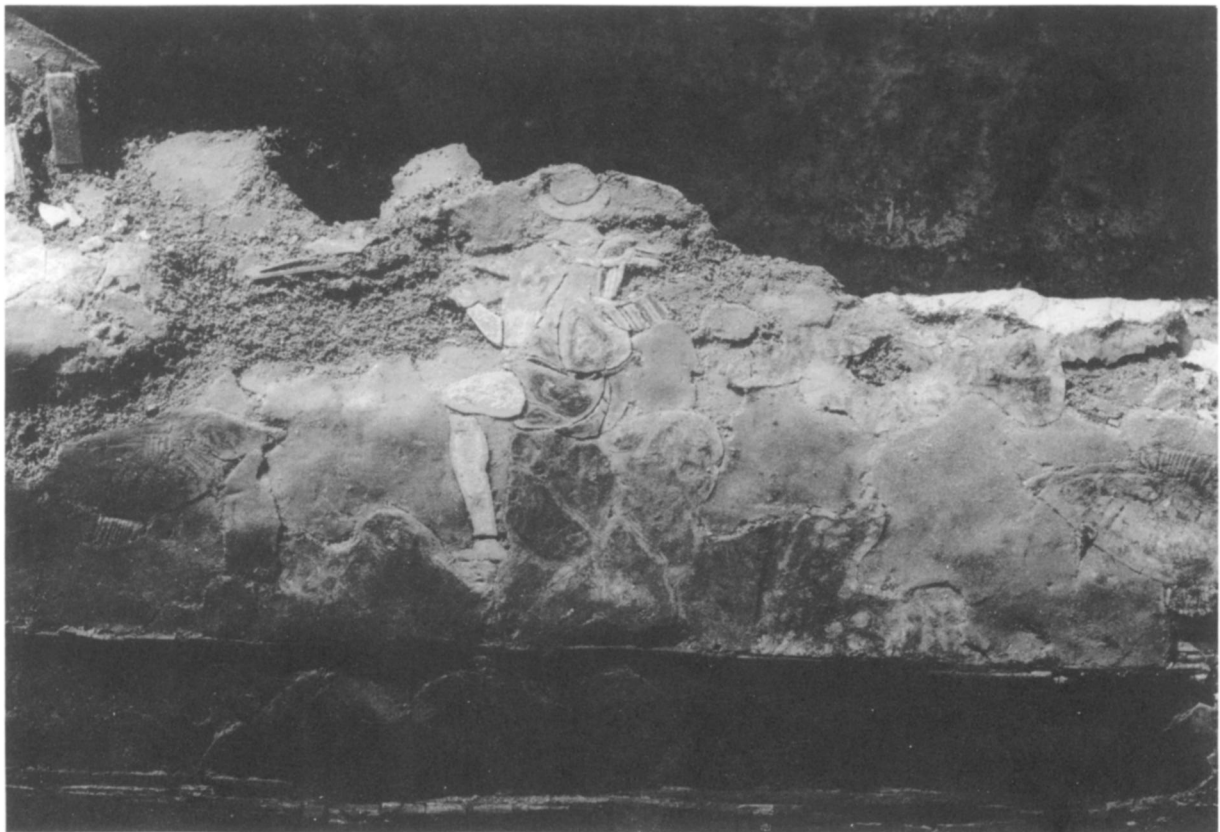
d. Panel of Opus Sectile, Ibis, Lotus and Papyrus

Area A, The South Pier, Sanctuary, Apsidal Building

ROBERT L. SCRANTON AND EDWIN S. RAMAGE: INVESTIGATIONS AT CORINTHIAN KENCHREAI



a. Panel of Opus Sectile, Song Bird



b. Panel of Opus Sectile, Fisherman and Fish  
Area A, The South Pier, Sanctuary, Apsidal Building



a. Panel of Opus Sectile, Water Bird



b. Panel of Opus Sectile, Homer, Detail

Area A, The South Pier, Sanctuary, Apsidal Building

ROBERT L. SCRANTON AND EDWIN S. RAMAGE: INVESTIGATIONS AT CORINTHIAN KENCHREAI





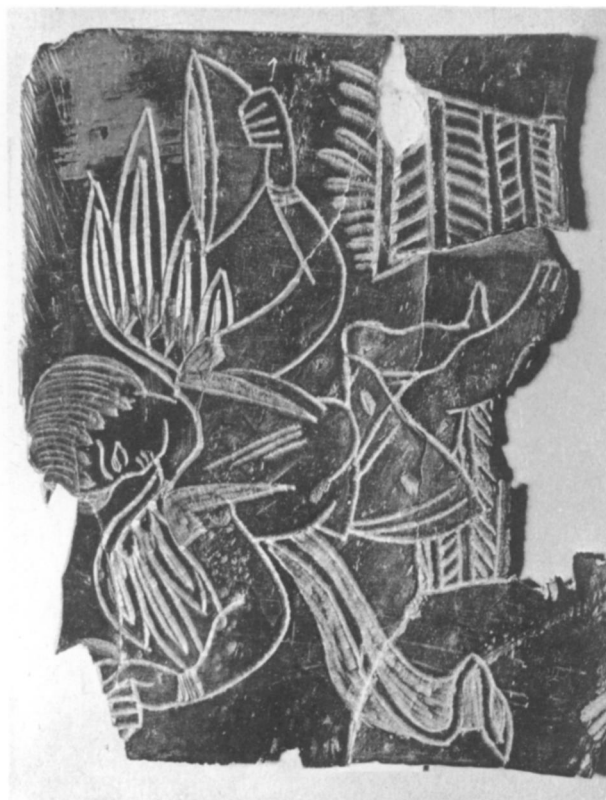
Area A, The South Pier, Sanctuary, Apsidal Building, Homer in Opus Sectile

ROBERT L. SCRANTON AND EDWIN S. RAMAGE: INVESTIGATIONS AT CORINTHIAN KENCHREAI



Area A, The South Pier, Sanctuary, Apse Building, Homer, Detail

ROBERT L. SCRANTON AND EDWIN S. RAMAGE: INVESTIGATIONS AT CORINTHIAN KENCHREAI



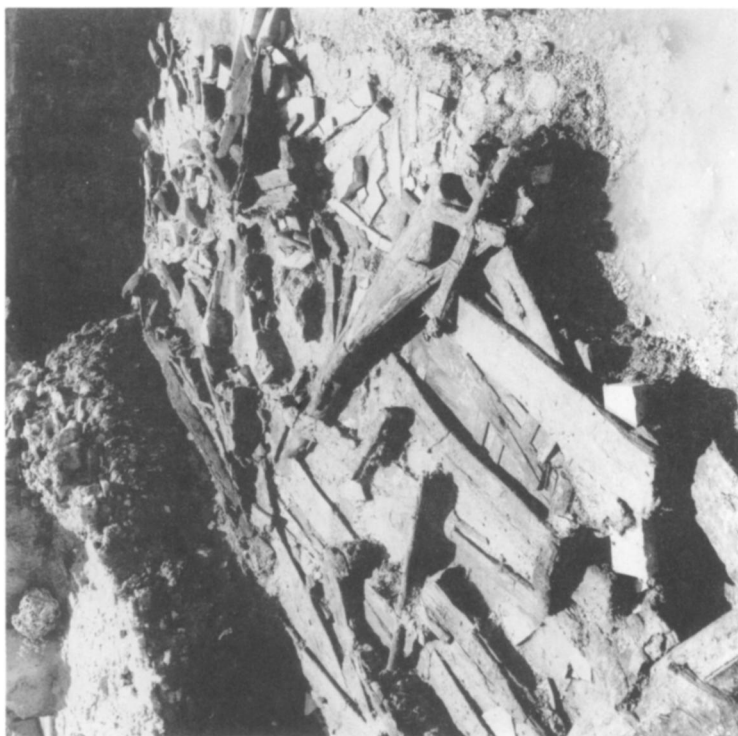
a, b. Engraved Veneer

Area A, The South Pier, Sanctuary, Apsidal Building

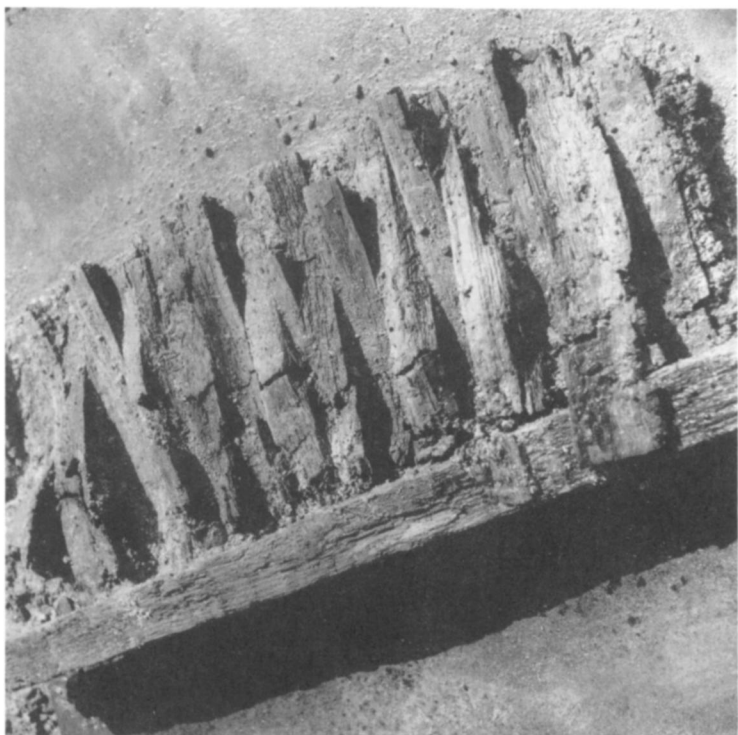


c, d. Ivory Plaques

ROBERT L. SCRANTON AND EDWIN S. RAMAGE: INVESTIGATIONS AT CORINTHIAN KENCHREAI



a. Debris near the Floor Level



c. Lattice Construction among Debris



b. Wooden Doors lying on Floor  
Area A, The South Pier, Sanctuary, "Temple"





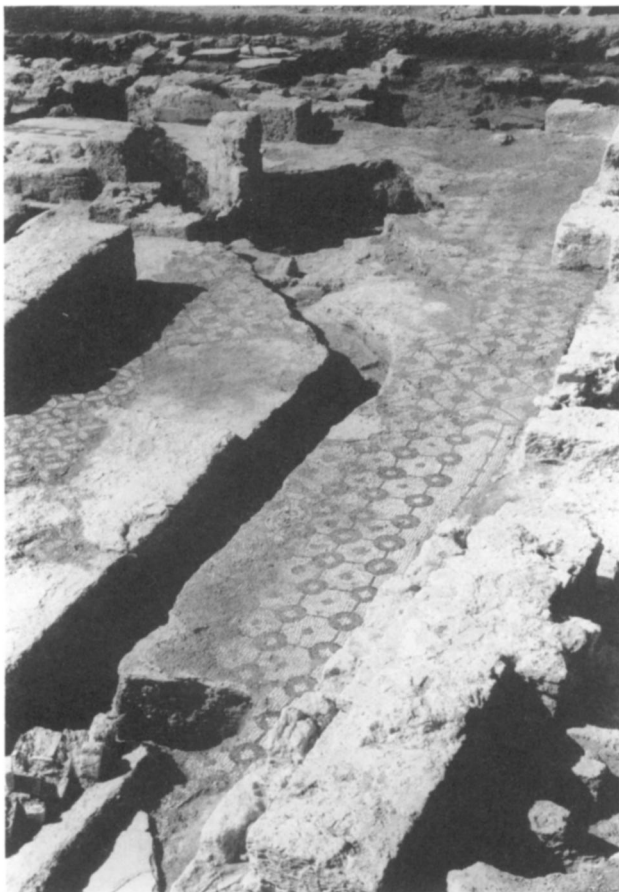
a. Roman Apse



b. "Marble Hall"

Area A, The South Pier, Church

ROBERT L. SCRANTON AND EDWIN S. RAMAGE: INVESTIGATIONS AT CORINTHIAN KENCHREAI



a. Exonarthex



b. Baptistery



c. Area Southwest of Exonarthex  
Area A, The South Pier, Church



a. Fresco from Area of Baptistry



b. "Bath"

Area A, The South Pier, Church



a. Early Wall with Bench and Pedestals



b. Brick Building from the South

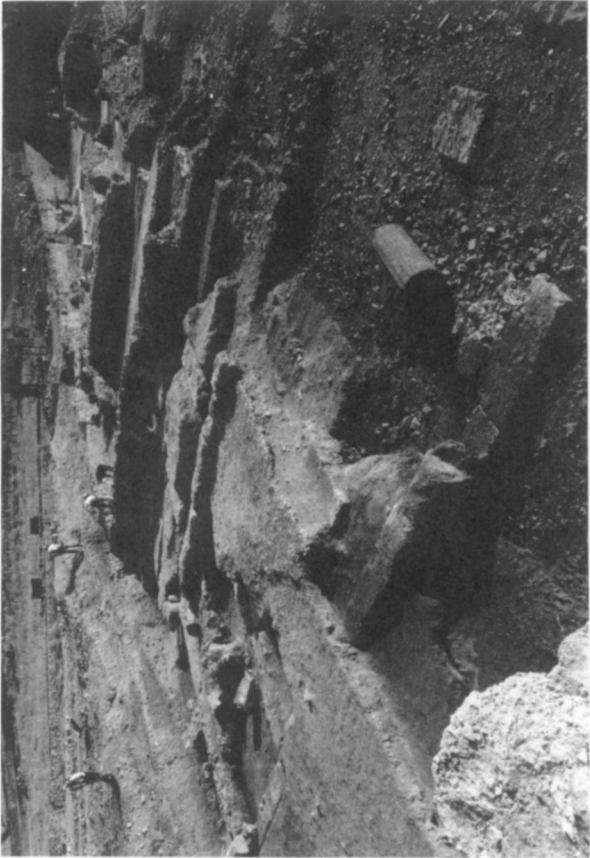
Area C, The Northeast Promontory

ROBERT L. SCRANTON AND EDWIN S. RAMAGE: INVESTIGATIONS AT CORINTHIAN KENCHREAI

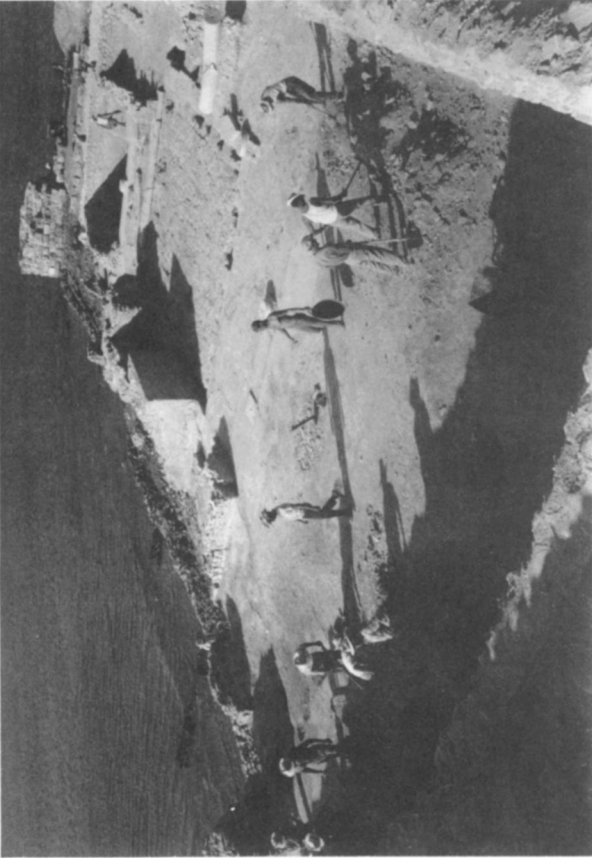
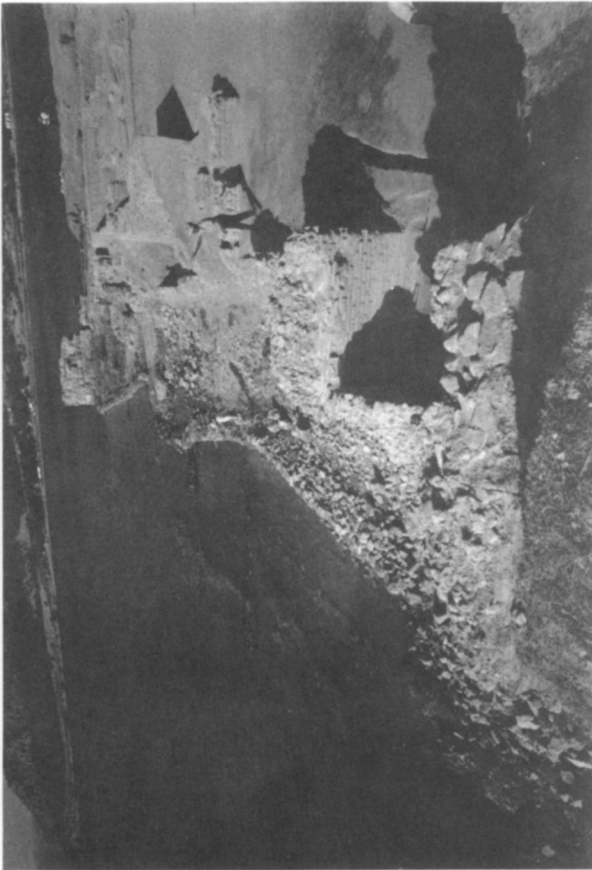




a. The Seaward Beach, looking North



b. Excavated Area, from South



c. and d. The Brick Building, looking South  
Area C, The Northeast Promontory



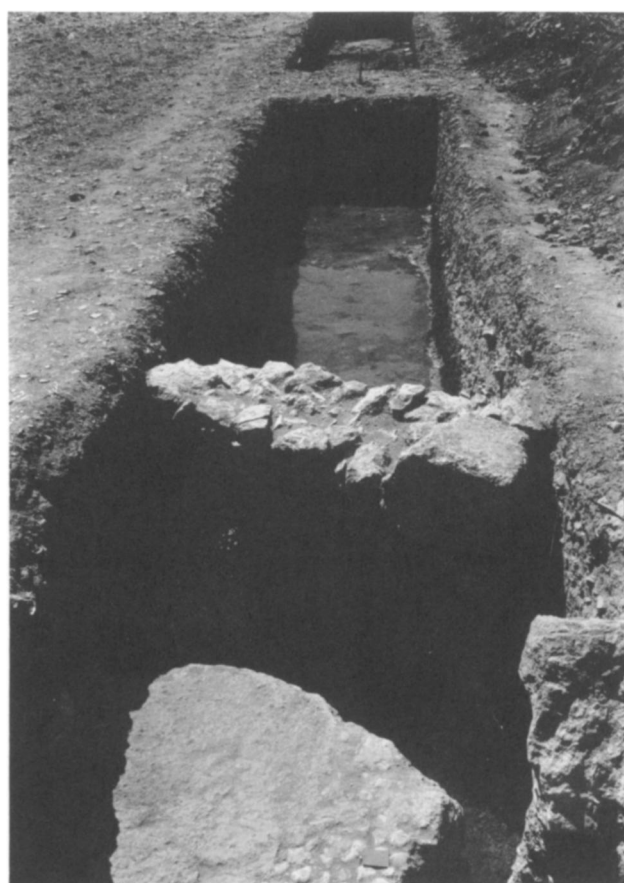
a. The Road between North and South Sections



b. The Brick Building, Mosaic Floor



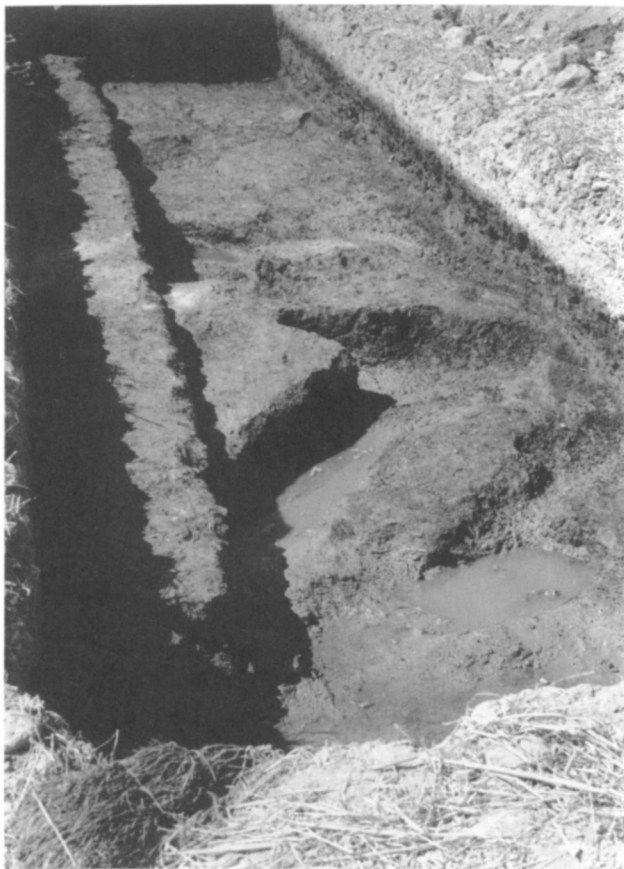
c. Harbor Face, Cobble Pavement



d. Harbor Face, Earthen Plateia Surface

Area C, The Northeast Promontory

ROBERT L. SCRANTON AND EDWIN S. RAMAGE: INVESTIGATIONS AT CORINTHIAN KENCHREAL



a. Earthen Plateia Surface



b. Heavy Masonry Walls



c. Early Christian Structures back from Shore



d. Classical Remains back from Shore

Area E, North Side of Harbor

ROBERT L. SCRANTON AND EDWIN S. RAMAGE: INVESTIGATIONS AT CORINTHIAN KENCHREAI





a. Detail of Masonry



b. Complex of Walls



c. Plaster-lined Basins

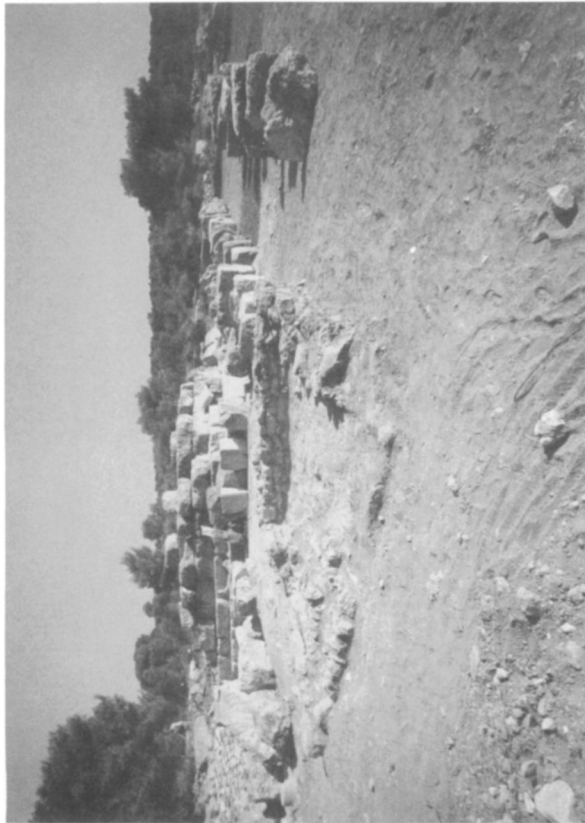


d. Rock-cut Cistern

Area G, Hill Above Harbor to North

ROBERT L. SCRANTON AND EDWIN S. RAMAGE: INVESTIGATIONS AT CORINTHIAN KENCHREAI





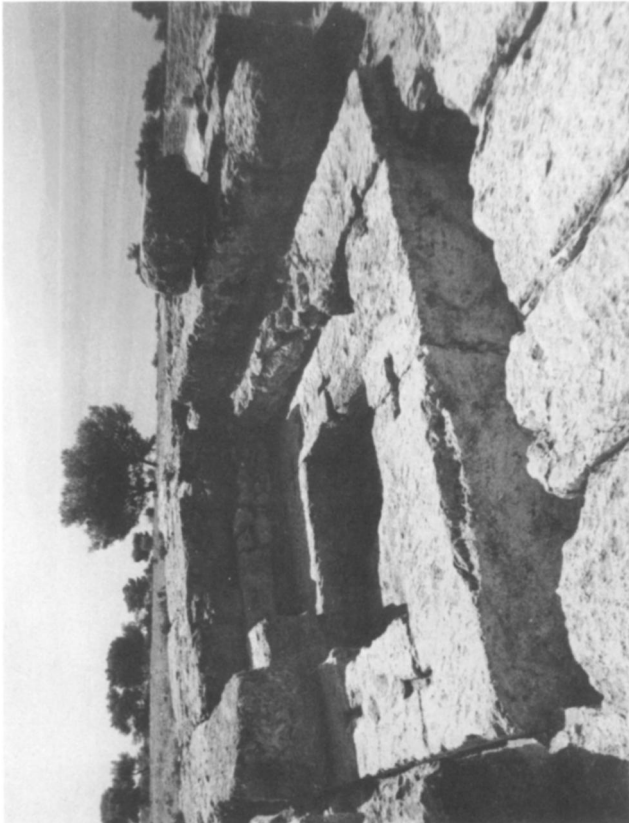
a. Structure North of Town, General View



b. Area B, Northwest Corner of Harbor, Monogram on Wall



c. Area G, Hill Above Harbor to North, Graffito on Potsherd



d. Structure North of Town, Core of Building



e. Structure North of Town, Marble Cornice