

EXCAVATIONS AT NICHORIA IN MESSENIA: 1969-71

GENERAL INTRODUCTION

THIS is a preliminary report on the first three seasons (1969, 1970, 1971) of digging on the Nichoria ridge. The Minnesota Messenia Expedition (MME), sponsored primarily by the University of Minnesota, has been organized more or less formally for considerably longer. For almost a decade before 1969 we carried out a wide-ranging, interdisciplinary program of surface reconnaissance and archaeologically oriented research in southwest Peloponnese. The region on which attention was concentrated covers about 1400 square miles. It includes all of the modern nomos of Messenia, plus the eparchia of Olympia (nomos of Eleia) to the north between the Nedha and Alpheios rivers. The two phases, regional study and excavation, were planned to complement and supplement each other. Fortunately, the final publication of the first phase should be available before this article; hence, readers are referred to it for a detailed description of the physical setting of the Nichoria site.¹

Both phases of our program have been carried out with successive permits issued by the Greek Archaeological Service through the American School of Classical Studies in Athens.² The major financial support for the regional survey came from the Hill Family Foundation of St. Paul, Minnesota; the excavation is being underwritten primarily by grants from the National Endowment for the Humanities matched by contributions from local foundations and individuals.³

The presence of prehistoric potsherds on the Nichoria hilltop was first certified by the writer, accompanied by Mr. Peter Shiras, in October 1958.⁴ In spite of its accessibility and visibility, towering over the village of Rizomilo at the junction of the Rizomilo-Koroni and the Kalamata-Pylos highways (Fig. 1), no modern topographer seems to have previously realized its archaeological importance. Of course, we are now hearing local accounts of chance discoveries as far back as the farmers can remember, and it appears that there must have been fairly large-scale illicit digging on the northwest acropolis (our Area II) within the past half-century.

¹ William A. McDonald and George R. Rapp, Jr., ed., *Minnesota Messenia Expedition: Reconstructing a Bronze Age Regional Environment*, University of Minnesota Press, 1972.

² It is a pleasure to acknowledge the cooperation of the successive directors of the Service, Ioannis Papadimitriou, Ioannis Kondis, and Spyridon Marinatos, as well as the successive ephors of western Peloponnese, Nicholas Yalouris, Georgios Papathanasopoulos, and Theodora Karageorya. The successive directors of the American School, Henry S. Robinson and James R. McCredie, have also been most helpful. To these and to many others, officials and private individuals in Greece and abroad, we offer sincere gratitude.

³ The financial and moral support of many good friends in Minnesota and elsewhere is warmly appreciated.

⁴ Site No. 76 in William A. McDonald and Richard Hope Simpson, "Prehistoric Habitation in Southwestern Peloponnese," *A.J.A.*, LXV, 1961, pp. 248, 249.

Two factors may at least partially explain the long delay in its "scientific" discovery. The ridge itself is composed of fine-grained marine sediments that were deposited when sea level was much higher in Pliocene times. This material is remarkably resistant to erosion; hence surface pottery is relatively rare over the remains of habitation. Also, the Kalamata-Pylos highway was diverted in the 1920's from the age-old direct line climbing a ravine that skirts the northwest end of our ridge to a circuitous route that allows motor vehicles to gain 100 m. or more elevation by gentler grades. Since then, only the local farmers use the former route that traverses the ancient cemetery area immediately north and west of the habitation site, where several burial mounds are "sitting ducks."

In the spring following the discovery of the site, the chance find of a grave was reported to the authorities. Dr. Nicholas Yalouris, the ephor of western Peloponnese, and the writer identified the only surviving vase (a small jug) as Proto-geometric. The grave was a small slab-lined apsidal structure in a field 300 m. to the north of the Nichoria ridge. Another local farmer turned over a bronze double axe of Mycenaean date which he had found even closer to the habitation site. When he took us to see the find-spot, we noticed for the first time several artificial mounds immediately west of the habitation site. They have turned out to belong, as we suspected then, to a Bronze Age cemetery.

Since the agreement under which excavation of the Nichoria ridge was ceded to MME in 1969 specifies that the Greek Archaeological Service will continue to investigate the contiguous cemeteries, we shall not attempt here any detailed description of the salvage and excavation operations conducted by the Service from 1959 to the present. It need only be recorded that there is mounting evidence for the existence of an important cemetery, used from early Mycenaean to Protogeometric times, to north and west of the Nichoria ridge. In addition, Mycenaean chamber tombs have been discovered bracketing the site to northeast, east, and south. One of them contained pottery from Geometric, Classical and Hellenistic times.⁵

In summer 1959, Yalouris and the writer conducted a very short test excavation near the southeast end of the Nichoria ridge (trenches shown in dotted lines in Fig. 2). Trenches 1 and 2 were dug at spots where surface pottery was particularly noticeable. In both cases, house foundations proved to be relatively well preserved just below the plough soil and the bulk of the pottery belonged to L.H.IIIA and IIIB. Trench 3 (the central of the three) was laid out to intersect a long wall that could be followed above the surface in an area of thick brush near the south edge of this southeastern acropolis (Fig. 3). Digging revealed a doorway in the wall giving access to the corner of a room. Our limited probing established that the building in question was not prehistoric, but the fairly abundant Mycenaean pottery recovered in the southern

⁵ Δελτ., XVI, 1960, p. 108; XVII, B', 1961-2, pp. 95, 96; XXIII, B' 1, 1968, pp. 156-159; A.A.A., 1968, pp. 205-209.

part of the trench suggested that the building might have been constructed on much earlier foundations or that earlier foundations might still exist in its immediate vicinity.

SITE AND SURVEY

Figure 1 makes reasonably clear the shape, size and setting of the site. It is located about 2 km. from the northwestern coast of the Messenian Gulf, on the east

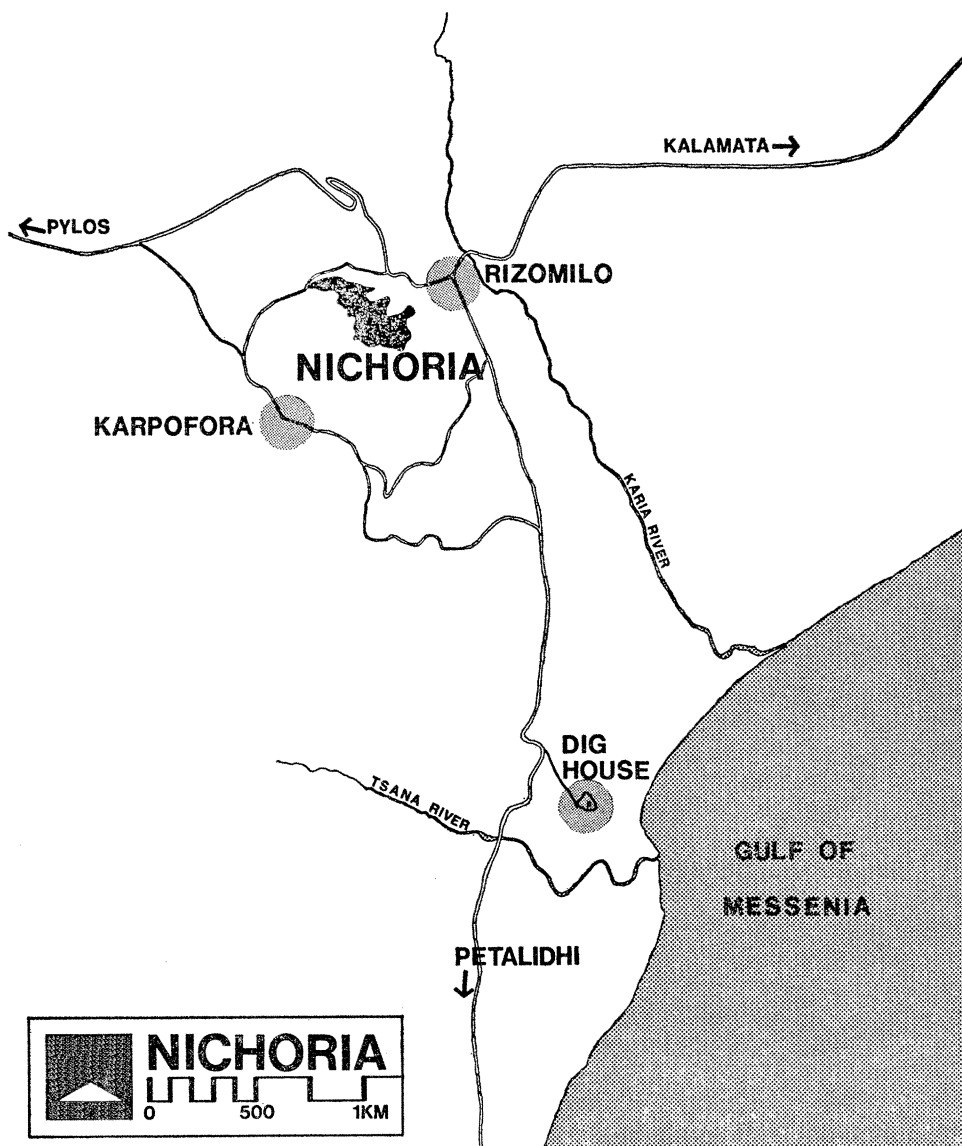


FIG. 1. Environs of Nichoria

edge of the plateau country (*kambos*) that characterizes the central Messenian peninsula. The position is strategic, controlling the main east-west land route across the peninsula where it changes elevation from plain to plateau and overlooking the junction of this route with the road along the west side of the gulf. The recent village of Rizomilo is located at this crossroad. From Nichoria one has an unobstructed view to east and south over the lower Pamisos valley and the upper gulf to the mighty Taygetos range—a command as sweeping as that of Ano Englianos on the west side of the peninsula. To south and west the eye controls long vistas along the main approaches by land. Only to north, across the old highway, a higher hill occludes the view; and a lookout post there would be an obvious precaution in time of danger.

To support an economy primarily based on agriculture and herding, the site had unsurpassed land resources. Two perennial rivers, the Karia immediately to east and the Velika a kilometer or so beyond, practically merge their valleys in an extensive and fertile plain whose wetter lowlands would have supplied abundant pasture for larger animals and whose gentle lower slopes would have lent themselves to raising irrigated crops. The western edges of the plateau country would likely have been sown in cereals, tree crops and vines, while the higher and rougher ground would have been available for small ruminants and for fuel and timber supplies. The long-occupied village of Karpofora, on a hill directly across the ravine called Vathirema, occupies a strikingly similar situation vis-à-vis its land.

The Nichoria ridge itself is relatively flat-topped, about 500 m. long, and oriented northwest by southeast (Pl. 38). Several gullies cut into either flank and add to the irregularity of its outline. Our deep soundings indicate that these gullies are not primarily the result of recent erosion but that in prehistoric times the hill was even more sharply dissected by deep ravines that were already filling with wash from higher ground. The bedrock of the ridge consists of nearly flat-lying Pliocene sediments, chiefly light brown silt, sand, and clay. These sediments exhibit fairly rapid lateral variation (*facies change*). At the northwest end a massive calcareous conglomerate provides a protective caprock which covers friable sandy layers below. Although for most of the hill no obvious caprock provides this shield against erosion, the apparent cohesiveness of the topmost siltstones and clays is adequate to maintain slope stability. Yet erosion has resulted in a retreat of the edges by as much as 6 to 10 m. in a few locations, notably in Area II at the northwest end (Figs. 2 and 6). So the ridge, in general, has a vastly different topographic profile today from that in the Bronze Age. Excavation is slowly revealing the development and alteration of contours as ancient retaining walls trapped waterborne and windborne sediment, resulting in unexpected depths of deposition.

No limestone formations occur in the stratigraphy of the ridge itself. The source of the ubiquitous limestone blocks that are encountered nearly everywhere we

dig and that have been ploughed out and built into field walls by the farmers is an area of tilted limestone outcrops lying less than half a kilometer to the northwest. Based on the 2 m. high erosional remnants still standing and on the nature and variability of the rock, one can calculate that the prehistoric inhabitants had a total resource of at least 72,000 cubic m. of prime building material within very easy reach.

The important problem of water supply is still under study. The inhabitants may have had to depend mainly on the perennial Karia River down in the valley to the east. But closer supplies from small springs cannot be ruled out. A seep, with summer flow of about 225 kilos a day, is located along the old road, near the southern foot of the hill facing Nichoria (Fig. 1). The site of another spring, now dry in summer, has been discovered near the bottom of the Vathirema southwest of Nichoria; and a branch from the valley road may have connected this spring with the acropolis (below, pp. 272-273).

The reports on excavated areas (below, pp. 227-256) take for granted the survey system and the preliminary geophysical exploration. Therefore, the necessary background information is included here, rather than with the remaining para-archaeological projects reported below (pp. 265-270).

Topographic surveying and mapping of the ridge was begun in 1962 by Jesse Fant, and he continued to supervise those operations through the 1969 season. In 1970 and 1971 Bryan Carlson has been in charge. Fant first completed a ground survey by the stadia method. Then, with the aid of stereo aerial photographs provided by the Royal Hellenic Air Force and a Kelch plotter at the University of Minnesota, he compiled more detailed maps of the site and its environs at scales of 1:1500 and 1:3000.

At the beginning of the 1969 season, a primary 100 m. grid system was staked out over the whole site, oriented with respect to astronomic and magnetic north by standard surveying equipment. Vertical control points in relation to sea level were also established. For this primary grid we use capital letters to designate east-west coordinates, and arabic numerals to indicate north-south coordinates. The ridge covers all or parts of fourteen such squares, extending from J25 in the northwest to N22 in the southeast (Fig. 2). All 1969 test trenches were identified by the square in which they were dug, followed by a running designation in Roman numerals (e.g. K25-III).

Because stereophotographic recording and mapping were planned for the following season, some experimenting was done in 1969 with a hydrogen-filled balloon and with the bipod arrangement that Julian Whittlesey had used successfully elsewhere. The balloon system which made use of a radio-controlled camera proved most valuable at higher elevations (Pl. 39, a). Excellent photographs of the entire site were taken by Whittlesey from an altitude as high as approximately 500 meters. However, when stereo coverage was attempted at low elevations, problems arose with camera orienta-

tion and position. Stereo recording requires two photographs taken at the same elevation, with the same orientation, and with a 60 percent overlap.

The best platform for stereo photogrammetry at low elevations seems to be a bipod arrangement. For purposes of experimentation, a bipod was constructed and photographs were taken with a 2¼- by 3¼-format camera. Stereo coverage was obtained by leaning the bipod to a second position an equal distance from the vertical plane to take the second photo. The camera orientation posed the greatest problem, but the concept was sound and useful results were obtained. The bipod-stereo camera unit, through its successive evolution from 1969 through 1970 and 1971, is primarily the design of Fant, with advice from Whittlesey and Carlson.

Prior to systematic excavation beginning in 1970, a 4 x 4 m. micro-site grid was laid out over the areas we expected to dig. The dimensions were chosen because they seemed to offer the best compromise between optimal sizes for excavation trenches and restrictions imposed by the decision to use stereo photogrammetry as the means for recording. Certain 100 x 100 m. squares in land we had meanwhile acquired were further subdivided into 25 x 25 squares, each 4 m. to a side (Figs. 3-8). Capital letters were again used to refer to east-west coordinates, and lower case letters for north-south coordinates. The southwest corner is used as the designation of each square in the grid. Thus the pattern for each 100 x 100 m. division is:

Ac Bc Cc
Ab Bb Cb
Aa Ba Ca etc.

Normally, trenches are 3.00 x 3.00 m. or 3.00 x 7.00 m., thus leaving baulks one meter wide. So, sample designations of particular 4 x 4 m. or 4 x 8 m. trenches would be K25 Hf (Fig. 6) or L23 UVo (Fig. 8).

A greatly improved bipod system was devised for stereo photography for the 1970 season (Pl. 39, b). A 7.6 m. bipod, made in sections of aluminum tubing, could be erected into position by two men and secured by two guy ropes. Two cameras of 2¼- by 3¼-format, mounted with parallel axis on a rigid section of aluminum channel, were raised into position for photography at about 6.7 meters. With air-bulb synchronization, the cameras consistently provided excellent stereo coverage.

For orientation in stereo plotting instruments, it is necessary to record by surveying methods a number of horizontal and vertical control points. These targets were placed in the excavated areas before each set of photographs was taken and then recorded in the field notes. Contact prints and photographic enlargement provided the excavators with a record for field use. The final mapping was done in the photogrammetry lab at the University of Minnesota.

Further improvements were incorporated into the bipod-stereo camera unit for the 1971 season. Two 35 mm. cameras with wide-angle lenses were mounted with a

wider separation of 2.29 meters. The elevation was increased to approximately 8.27 m. to allow for full coverage of the 4 x 4 m. squares. The bipod itself was rebuilt of heavier material to reach the desired height. Since the excavators needed field plans at a scale of 1:20, a semi-portable multiplex stereo plotting instrument was set up at the excavation house. A total of 85 pairs of photographs were taken and critical areas were plotted during the excavation. The finished plans (including Figs. 1-7, 9) were prepared by Bryan Carlson at the University of Minnesota.

Following successful tests of the proton magnetometer and the electrical resistivity meter in Messenia in 1966 and 1967, these instruments were chosen to guide us in identifying locations for trial trenches during the 1969 test season. With assistance for two weeks from Martin Aitken, who brought along two LSEC proton magnetometers, George Rapp supervised over 100 magnetic surveys in 6 x 10 m. or 10 x 10 m. grids (Pl. 39, c). Rapp also ran 40 electrical resistivity traverses, using a Bison instrument.

Of the 66 trial trenches dug in 1969, 40 were laid out over geophysical anomalies. Of the 40 trenches, 30 revealed significant archaeological features, including walls, pits, and burials. Eight anomalies were caused by geological features, one remains unexplained, and one located a sardine can. The flat-lying sediments on Nichoria provide an excellent background for detecting the magnetic contrast between the iron-free limestone used in construction and other iron-rich settlement debris. The permeable bedrock and fill also furnish strong electrical resistivity contrasts to the impermeable limestone of buried walls and foundations.

In addition to geophysical exploration, special combinations of infra-red sensitive films and filters were used in an effort to detect buried archaeological features from pictures taken by Julian Whittlesey at heights up to 500 meters. These efforts were not successful. If such techniques were used during the season when the surface soil contains more moisture, an infra-red contrast between fill and foundations might be perceived.⁶

THE 1969 CAMPAIGN

INTRODUCTION

This first, test season began on June 9 and ended on August 4. The senior staff consisted of 11 excavators and associated specialists.⁷ Local workmen averaged 15.

⁶ For more complete accounts of surveying and of geophysical methods used, see Chapters 2 and 15 of the book referred to above, note 1. On the geophysical work at Nichoria in 1969, see also George Rapp, Jr., "Geology in Aid of Archaeology: Investigations in Greece," *Journal of Geological Education*, XVIII, 1970, pp. 59-65.

⁷ In addition to the writer (director) and George Rapp, Jr. (associate director in charge of all para-archaeological work), experienced staff members were William Donovan (excavator), Jesse Fant (surveyor, photographer), Richard Hope Simpson (excavator), Roger Howell (excavator,

The foreman was Georgios Anastoulis of Miraka, near Olympia. Liaison with the Greek Archaeological Service was through Mr. Angelos Choremis who represented the ephor, Mr. Georgios Papathanasopoulos. Mr. Choremis and his wife carried out some of the exploration of the cemetery area that we referred to above.

The primary purpose was to learn as much as possible about the extent, preservation, and approximate date of ancient habitation over the whole Nichoria ridge. A distinctly secondary aim was to try to locate the ruins of the dwelling(s) of the local rulers who had been buried in several known tholos tombs west of the site. Since its discovery, Nichoria had been tentatively equated by various authorities on the Pylos Linear B tablets with one or another of the major towns in the "Further Province" of the kingdom of Pylos in the 13th century B.C. Dr. John Chadwick, the MME specialist in the correlation of surface search with information in the tablets, suggested that Nichoria could be RE-U-KO-TO-RO which appears to have been the administrative center of the Further Province; if so, there is a reasonable chance that written records were kept and clay tablets might be recovered. A third objective was the training of nine graduate students holding traineeships provided by the Ford Foundation.⁸

Following the preliminary survey, aerial photography and geophysical search were utilized to assist in selecting the location of test trenches and pits (for details see above, pp. 222-224; 1969 digging is shown in simple outline in Fig. 2). All land-owners on this very large hilltop cooperated generously, but olive and fig trees imposed limitations to the investigation of some anomalies. Under the following subheadings we provide a brief account of the results of the follow-up digging. Each field where important tests were made is identified on the maps either by the owner's name or by our more recent system of designating by Areas I through VII (Fig. 2). For convenience, we list here the designations of the various units, in approximate order from northwest to southeast of the site:

Area I (Fig. 5)

Area II (Fig. 6)= Papamichroulis West

Area III (Fig. 7)= Papamichroulis East

North Veves

M. H. pottery), John Lazenby (excavator), Elizabeth Lazenby (small finds), Elizabeth Milburn (L. H. pottery), Julian Whittlesey (balloon photography), Nellie Paraskevopoulou (conservationist). Patricia Donovan, Angeline Lieber, and Eunice Whittlesey acted as assistants. Stanley Aschenbrenner was also associated, although he lived in Karpofora, where he was beginning a 15-month study of village life. Mr. Sotirios Chrysomallis began his useful role as our financial agent in Kalamata.

⁸ The student trainees were Robert Black, Bruce Cooke, Ada Fridman, Mark Ketcham, Janice Mackey, Patrick Shannon, Mary Sturgeon, Nancy Wilkie, Bryan Carlson. All were introduced in rotation to the various activities connected with excavation, recording, conservation, photography, surveying, geophysical instruments. There was a weekly program of seminars and field trips.

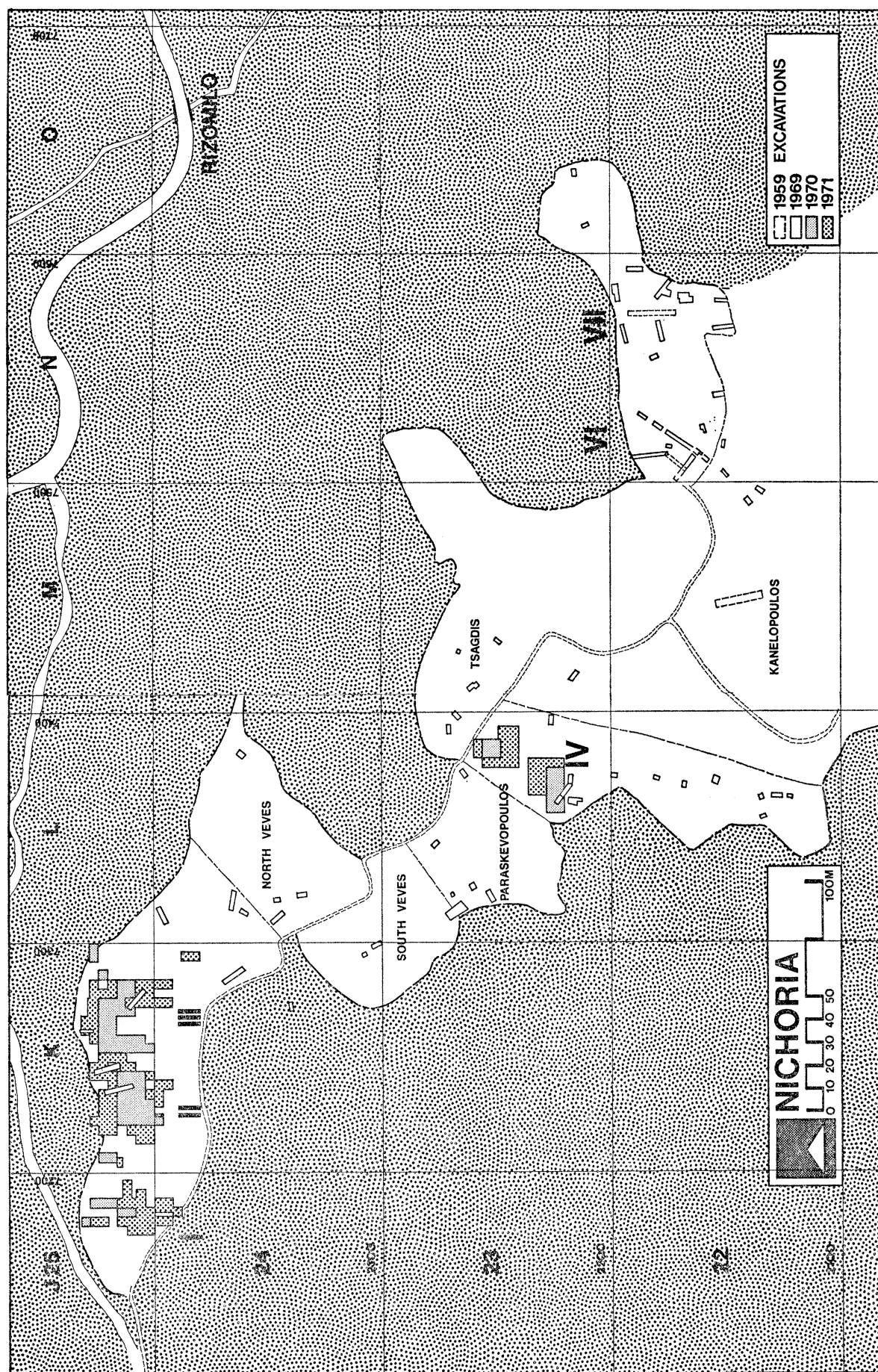


FIG. 2. Overall Site Map : 1959-71

South Veves
Paraskevopoulos
Tsagdis
Area IV (Fig. 8—north only)= Kaisareas
Kanelopoulos
Area VI (Fig. 3)= Anna Veves
Area VII (Fig. 4)= Dionysopoulos

The movable finds, mainly of pottery and other small artifacts, from the 1969 tests have not been described separately in this section. They will be discussed in context with the similar material from 1970 and 1971 (below, pp. 257-265). The MME tradition of interdisciplinary effort led to the design and construction, prior to this first excavation season, of a facility that would serve as an "on site" laboratory as well as provide staff housing. It was constructed about 2 kilometers south of Nichoria ridge, and directly above the gulf (Fig. 1). In addition to the normal space and equipment for conservation and for the study and storage of pottery, small finds, and animal bones, the excavation house has proved adequate for the following operations: (1) processing of color, black and white, and IR-sensitive film; (2) bulk materials separation (gravity concentration, float-sink, sieve analysis); (3) lithological analysis (binocular and petrographic microscopy); (4) drafting and map making; (5) multiplex stereoplotting of the photogrammetric record.

PAPAMICHOULIS WEST = AREA II (Fig. 2)

Trenches I and II in grid K25 were dug on the top of this northwest acropolis to check major anomalies. The supervisor was William Donovan. Both tests revealed numerous wall foundations and it was clear that two major construction periods were represented, one being late Mycenaean and the other a much more recent post-classical phase. More detailed description of the architectural history here will be given below, pp. 242-244. Some scattered pottery belonging to early Mycenaean times and to a late phase of Middle Helladic was recovered, though it could not be associated with structural remains.

Two burials of young children occurred among stone rubble in Trench II (Pl. 40, a). In one, the body was laid on earth, and the grave (0.90 x 0.35 m.) was lined with thin stone slabs and covered with similar material. One large cover slab was found in place. In the other grave, the body was laid on its side on a stone slab and the sides of the tiny grave (0.65 x 0.35 m.) were slab-lined. Although no offerings were found, these burials probably date to Late Helladic times.

The test trenches in this area also provided considerable evidence on the prospects for extensive excavation, since totally eroded areas where the consolidated caprock was very near the surface alternated with deep pockets, either quarried or natural, where a meter or more of habitation debris was preserved.

PAPAMICHTHOULIS EAST = AREA III (Fig. 2)

Richard Hope Simpson was in charge of these tests. It was quite clear from the many large stones and some scattered potsherds on the surface that the sector of this field immediately below the northwestern acropolis was very promising. Several magnetometer anomalies occurred here, and a long trench (K25-III) was laid out to straddle two of the most significant of these (southeast corner of grid K25). The trench revealed the exterior walls of a large structure about 6 m. in width, as well as a partition wall (Pl. 40, b). The debris, over a meter thick, was cleared down to the level of the latest floors. The *terminus post quem* for these was provided by the L.H.IIIA2 sherds found in them, and the debris immediately above them included L.H.IIIA2 and L.H.IIIB sherds. A few Protogeometric fragments were found above the debris, just below the plough soil. The floors were somewhat uneven, since they had been laid on a deposit of rubbish about a meter thick which had been washed or thrown down from the acropolis. The lower 0.80 m. of this rubbish was M.H./L.H.I, the upper 0.20 m. M.H. to L.H.IIIA. At the southeast end of the trench the depth of debris increased to over 2 meters. The magnetometer anomalies were thus explained by the contrast between the house walls and the loose deposits of rubbish. Near the north edge of the ridge (just below and east of the K in Fig. 2) trench K25-IV was dug over another anomaly. It revealed the foundations of a massive terrace wall, about a meter thick and constructed of large blocks against the natural caprock.

Within grid L24 in the southeastern part of the field, trenches IV, V and VI indicated that this sector is either excessively eroded or was never built over. The natural caprock or undisturbed bedrock was reached in most places near the surface. Trench IV (the middle one) produced possible traces of wall foundations and a debris level, as well as a few Geometric sherds. This may mark the edge of a terrace.

In grid K24 on the lowest terrace near the south edge of the field, trench III struck a medieval or modern fill about 2 m. thick which overlay debris levels in which some worn L.H.IIIB sherds occurred. This level was not investigated further.

NORTH VEVES (Fig. 2)

This field lies entirely within grid L24. Four trenches were dug under the supervision of William Donovan. The first three were laid out over strong anomalies detected by the geophysical instruments. Trench III, in the east corner of the upper part of the field, revealed a stone cairn covering a "warrior burial" of the late 8th century B.C. (Pl. 40, c). The pithos in which the burial was made and the major grave offerings (vases, bronze bowl, sword) are now on display in the newly-opened Benaki Museum in Kalamata. Dr. Aris Poulianos has carefully reconstructed the skull and studied the relatively well preserved skeleton. His findings will be included in a report on the burial that is now being prepared and will be published later.

In the lower area near the path, trenches I and II revealed the ruins of substantial buildings. No complete rooms were cleared. One wall in trench II (furthest south), preserved to a height of 1.71 m. and 0.80 m. wide, suggests that it belonged to a major building. The other foundations are narrower and more ruined. Floor deposits indicate at least two periods, both within L.H.III, for the history of habitation here. Some Dark Age pottery was also recovered. The most interesting discovery was the fragments of a decorated krater (Pl. 50, a) inside a pithos that had been sunk into the floor of one of the rooms partially cleared in trench II. In this vicinity there were obvious signs of heavy burning. Trench VII was dug near the west corner of the field to test the depth of deposit. No architectural remains were encountered.

SOUTH VEVES (Fig. 2)

Three trenches were laid out in this field, under the supervision of Roger Howell. Trenches I and II, on the brow of the hill in the center of the field, were in the south-east corner of grid K24. Trench XII in grid L23 was dug in the lower part of the field (south corner) and extended into the neighboring field.

The earliest material came from trench XII, where the top of a complex of three walls was reached about 1 m. below the surface. There were traces of hard-burnt earth in one of the rooms formed by these walls. Immediately above the walls, material of an early phase of the M. H. period was found, giving a *terminus ante quem* for the building. Unfortunately, the trench had to be abandoned before the base of the walls was reached. Above the early M.H. material was a mixed deposit of early and later M.H. material, 0.60 m. deep, behind a terrace wall to the south. This wall appears to continue toward the west, but it does not reach the east side of the trench. It was presumably built to keep the soil on the hilltop from washing down into the ravine on the west side of the ridge. The modern field boundary is exactly on the line of this wall. Above the M.H. deposits was a level of plough soil containing both M.H. and Mycenaean sherds.

In trench I we encountered part of a gully, oriented northwest by southeast, which was filled with M.H. material of the later phase. Above was a level of stone tumble that seemed to be spilling down from the northwest. The debris may have been from a dwelling, since there were several stone querns in the rubble. Early Mycenaean sherds were found associated with the tumble, and into it had been set a pithos that is apparently of L.H.II date. In trench II, just to the north, bedrock was found only 0.15 m. below the surface.

PARASKEVOPOULOS (Fig. 2)

Seven trenches were laid out in this field, if we include the south end of trench XII discussed above. All of them fall within grid L23, and Roger Howell supervised the tests in all except trench X. Trenches I, II, III and XII were in the northwestern part of the field, trenches VII and X to the east.

The earliest material came from the northwest where early M.H. levels were found in trenches I, II and XII. In a small sounding in the southeast side of trench XII a floor of early M.H. date was reached on which was a stone-built hearth. Above this was a deposit of early M. H. material, and in the east edge of the trench we cleared one face of what appeared to be part of the outside of a wall, possibly of the same date. Slightly further to the east, trench I revealed another early M.H. wall with a sandy floor near its base. The top of this wall was only about 0.20 m. below the modern surface. To the south, trench II revealed a pit or possibly a shallow gully about 0.20 m. deep with an early M.H. fill. In trench III at the western edge of the field, later M.H. material was found in a thin layer above bedrock and not far below the surface. Other later M.H. material was also found above the early M.H. level in trench XII.

L.H.II levels were located both in the northwest and east sectors of the field. In trench XII a level of L.H.II debris occurred above the M.H. layers at the foot of the terrace wall described above, thus providing a *terminus ante quem* for its construction. The level was deeper on the west side of the trench, where the hill begins to drop more steeply, and there was also some stone scatter on this side. In the western half of trench III a line of loose stones was found along the brow of the hill, above the M.H. deposit. This may represent the remains of a ploughed-out wall; and further west, where the hill begins to drop more steeply, some early Mycenaean sherds were found amongst stone rubble.

William Donovan supervised trench X in the southeast corner of the field. The lowest level contained a thick deposit of L.H.II sherds mixed with L.H.III. Above this, sections of four L.H.III B walls seem to belong to a single structure. The rubble covering them contained some Dark Age sherds. Trench VII, also on the east side of the field, had to be abandoned before reaching the deep deposits that probably underlie this sector of the field where the original slope toward the Karia River valley to the east has been steeply terraced. In the center of the field, undisturbed bedrock was reached in trench VI (not shown in Fig. 2) 0.15 m. below the surface.

KAISAREAS = AREA IV (Fig. 2)

Twelve trenches were laid out in this field, which is about evenly divided between grids L23 and L22. In grid L23 trenches IV, V, VIII and IX were dug in the southwest sector, and trench XI on the east side. In grid L22, the higher southern part of the field, trenches I-VII were strung out more or less in order from south to north.

Some early M. H. material was found in an alluvial deposit in trench VIII, above which there was a deposit of later M. H. together with some Mycenaean sherds. In grid L22, later M. H. material was also found in thin levels above bedrock near the

surface in trenches II and III as well as at the bottom of a pit (possibly a small gully) in trench IV. A mixed deposit of later M.H. and L.H.I sherds occurred at a higher level in trench IV, as well as in a small pit in trench I. In the upper level of the pit or gully in trench IV were some L.H.II sherds. L.H.II material was also found above a sturdy wall in trench XI, providing a *terminus ante quem* for the date of its construction. Over the L.H.II level was a mixed deposit containing L.H.II and L.H.III sherds.

In trench L23-V a curved wall was found (later discovered to be a terrace wall) which contained in its arc a deposit of L.H.IIIA2 pottery about 0.60 m. deep. Outside the wall, stretching southeast from its base, was a deposit of L.H.IIIA2/IIIB material. Just to the south, in trench IV, more L.H.IIIA2/IIIB sherds were found amongst stone rubble scattered toward the edge of the hill. On the higher southern part of the field, in trench L22-VII two more walls of L.H.IIIA2/IIIB date were cleared, including parts of two rooms in which several quernstones came to light.

Above the L.H.IIIA2/IIIB deposit in trench L23-V there was a layer of thickly packed stone rubble in which a few worn sherds of possibly L.H.IIIC date occurred. Above this level was a thin sandy layer and then another layer of thickly packed stone rubble with Dark Age sherds. Dark Age material was found in the upper level elsewhere in this vicinity, including that over the curved wall and the L.H.IIIA2 deposit behind it. It is a characteristic of the Dark Age levels here that the soil is very dark and sandy and extremely hard. The test trenches made it clear that, although bedrock lies close to the surface at the higher southern end of this field, the northern sector in grid L23 has a deep and well stratified deposit of habitation debris extending in time from the M.H. period to the Geometric.

TSAGDIS (Fig. 2)

Five trenches were dug here by J. F. Lazenby. Trenches I and III, in the upper (east) area, yielded very little of archaeological significance. It may be that anomalies at these spots were the result of undisturbed bedrock being particularly close to the surface. Further west and somewhat lower, trench II cut across a fairly wide (0.60 m.) and high (1.15 m.) east-west wall. The material was mainly medium-sized and irregular limestone blocks, but one very large single block measured approximately 1.67 m. long, 0.45 m. high and 0.35 m. thick. To north of the wall the habitation debris was noticeably deeper, which probably indicates that the wall supported a terrace. A badly tumbled line of stone extending south at right angles to the terrace wall may have belonged to a building abutting on the terrace. The associated pottery was uniformly L.H. IIIA2/IIIB.

Trench IV, still further west, contained a layer of scattered blocks below the plough soil. None seemed to be in place, except at the extreme northwest corner where a wall reaching a height of 0.55 m. was preserved. This trench also showed that the

original contours were considerably steeper. Except for fragments of a fine L.H.II jug resting on undisturbed bedrock, the pottery was uniformly L.H.IIIB. A feeding bottle was restorable and there were many fragments of kylikes. Trench V, near the northwest corner of the field, revealed what was apparently the corner of a building with walls running approximately north-south and east-west, plus a bit of a wall 0.75 m. high belonging to a separate building in the extreme northwest corner of the trench. Associated pottery was L.H.IIIA2/IIIB.

This area shows very severe effects of erosion. It is clear that in late Mycenaean times the lower part contained a fair number of buildings on terraces dropping down from southeast to northwest. The higher part may also have been built over, but the record is now totally gone. There is little evidence that this part of the site was occupied in early Mycenaean times and no proof whatever of its use in the Middle Bronze or early Iron Age.

ANNA VEVES = AREA VI (Figs. 2, 3)

This field in the western part of grid N22 occupies the southeastern acropolis of the Nichoria ridge (Pl. 41, a). Tests here were mainly under the supervision of Richard Hope Simpson. Substantial walls of a large building, with long axis northwest to southeast, had been briefly investigated in one of the 1959 trial trenches dug by Yalouris and McDonald (trench 3, shown by dashed lines in Fig. 3). In 1969 the dense thicket which had covered and preserved the building was totally cleared, and trenches I, IV and IX were laid out to cut a section across its width and to explore one end wall. Trenches III (excavated by William Donovan), X, and XI were dug to investigate magnetometer anomalies found by Brian Mitchell in 1966. Trenches V, VI and XII were intended to test the remainder of the acropolis.

Since a considerable amount of Mycenaean pottery had been found in the 1959 trial, it was hoped that traces of Mycenaean walls would be revealed under the walls of the medieval building. But it was discovered that the floors and walls of the two rooms investigated were laid on the local bedrock, with the exception of a substantial pit below the floor and part of the northeastern wall of the central room. The pit, about 4 m. in diameter and 1 m. deep at the center, extended about 2 m. outside of the building. It produced a deposit of L.H.IIIA2 and IIIB pottery, together with fragments of figurines and a piece of painted wall plaster. In trenches I and X levels were found which have all the normal characteristics of "robber trenches," presumably dug by the builders of the medieval structure in their search for building materials. The trenches clearly indicate the line of robbed-out walls of an earlier date. The back-fill in the trenches contained L.H.IIIB, IIIC and Protogeometric sherds. It appeared that the best blocks had been removed and that only stones useless for construction purposes were thrown back into the trenches. Elsewhere in the field bedrock appeared almost directly below the plough soil and no ancient remains were

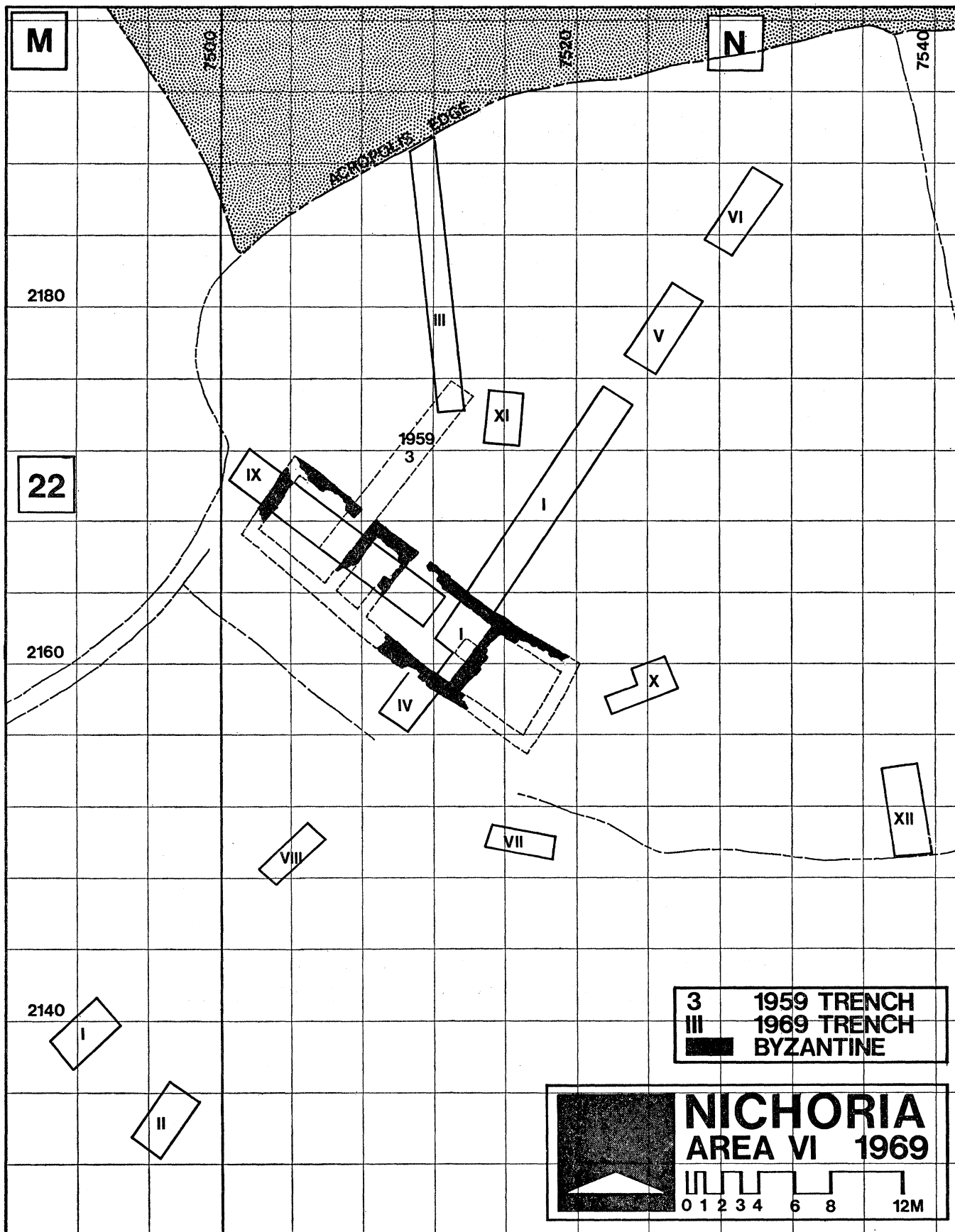


FIG. 3. Area VI (Anna Veves): 1969.

found. One must therefore conclude either that most of the acropolis was not built over in Mycenaean times or (more likely) that intensive cultivation has removed all traces of occupation.

William Donovan dug four trenches immediately below the south edge of the acropolis. Trenches VII and VIII were relatively unproductive, but Trenches I and II in grid M22 (Kanelopoulos field) produced deep Mycenaean debris that had been either thrown or washed from above. There is also surface evidence for similar debris on the upper terraces under the northwest edge.

The ruined building on the acropolis is approximately 20 x 5 m. in external measurements. It consisted of three rooms that do not seem to have been intercommunicating. The central one was clearly the most important. It had a stone platform built against the middle of the southeast wall (Pl. 41, b). A broad bench or raised dais of orange clay extended the whole length of the northwest end of the room. Without full excavation, which was not feasible in a test season, we were not able to determine the character and purpose of the building. The black soil of the debris within and immediately outside suggests the use of a considerable amount of timber in its construction. Many fragments of large roof tiles, only slightly rounded in profile, and several medium-sized square iron nails suggest that it had a simple pitched roof. The tiles are very similar to those used to cover graves examined by Choremis the same year on the knoll of Tripetorachi just below Nichoria. Since some Byzantine objects were found in these graves, it is probable that our building is also medieval.

DIONYSOPOULOS = AREA VII (Figs. 2, 4)

The 1959 trial trench (No. 1, shown in broken lines in Fig. 4) in the central terrace of this field showed that the eastern spur of the Nichoria ridge was probably a nucleus of Mycenaean settlement. In 1969 further trenches were laid out in the same vicinity, the eastern part of grid N22. Most of this work was supervised by Richard Hope Simpson.

Trench XIV, sited to straddle a resistivity anomaly, demonstrated that the cause was the corner of a substantial building. The best evidence came from this and the neighboring trench XV (Pl. 41, c), as well as from trenches XVIII and XIX that were excavated by J. F. Lazenby and Mary Sturgeon. It appears that, apart from a small area toward the north edge of the field (partly examined in trenches XVII and XVIII extension), the best preserved remains lie in the area between the 1959 trial and trenches XIV and XV, that is to say in the central and south terraces. Elsewhere, as was shown in trenches XIII, XVI, and XX and in two small trials (trenches I and II in grid O22 on the easternmost spur), erosion and medieval or later cultivation have totally obliterated any evidence of habitation if such ever existed. Trenches XXI and XXII, on the upper terrace of the southwest slope, also showed that bedrock is very close to the modern surface.

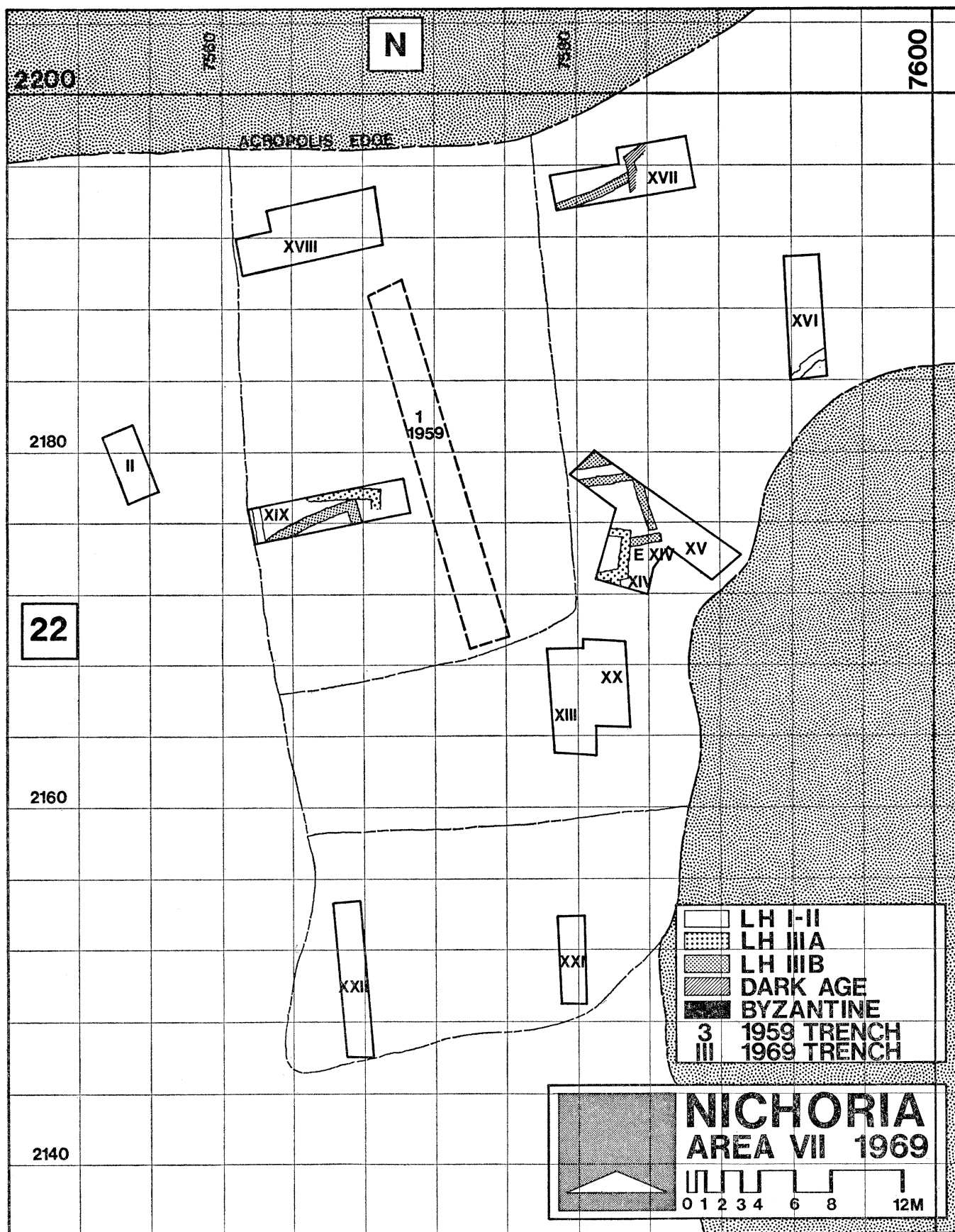


FIG. 4. Area VII (Dionysopoulos) : 1969

It may be worth noting that several of the trenches here revealed slots that had been cut into the bedrock. They varied in depth but were no more than 0.15 m. wide. They are laid out in roughly rectangular patterns, and the powdery brown earth at the bottom of some slots is possibly from decayed roots. The slots would appear to be connected with viticulture, presumably of the medieval or Turkish period, since local informants say that modern vine trenches are quite dissimilar. The slots are certainly post-Mycenaean, since one in trench XVI cuts into the outer edge of a Mycenaean foundation.

Trench XIX, near the west edge of the central terrace, revealed the foundations of Mycenaean structures close below the surface. Two L-shaped wall systems were found set one within the other, of almost identical orientation, and so close together that they cannot be contemporary. The floor levels once associated with them are lost. The walls overlie rubbish deposits totaling about 1 m. in depth. The pottery in this rubbish is dated as late as L.H.IIIA, and the earliest of it represents the rather rare occurrence of a late phase of M.H. in this sector of the ridge. L.H.II and L.H.IIIA sherds were found at the level of the foundations and above. Thus it seems likely that the walls are of L.H.IIIA date or later. A third wall, at the western end of the trench and at a slightly lower depth, could be L.H.II. Trench XVIII, at the north edge of the central terrace, struck caprock nearly everywhere, but when extended northward it produced a sequence of walls and floors terraced back into the slope to the north and associated with deposits of L.H.II and L.H.IIIA2 pottery respectively.

In trench XVII, also near the north edge, a high curved wall was terraced back into the caprock from the north. This wall was in turn cut into and partly ruined by the corner of a building whose interior lay to the south. Above this was a further wall foundation on a similar alignment. This uppermost wall was separated by about 0.10 m. of earth deposit. It may belong to the Protogeometric or Geometric phase, if we can judge by the sherds found in the disturbed upper levels adjoining it. The lower walls presumably date to L.H.IIIB or L.H. IIIC, since the sherds in the fill of heavy stones and dark earth to north of the high curved wall are all of this general period. Possible traces of a floor were found at a depth of about 0.70 m. below the surface and about 0.20 m. below the top of the curving wall. L.H.IIIC "close style" sherds were found here, but the restricted space in the trench left it uncertain whether these date the construction of the floor or the final period of its occupation. Trench XVI, in the south part of the same area, revealed the foundations of the corner of a house with associated L.H.II sherds.

On the south terrace, trench XV produced clear levels of the same rubbish deposits as described above in trench XIX. Totaling about 1 m. in depth, they comprised a L.H.I/II and a L.H.III phase. They underlie the outer walls of a substantial building that extends into trench XIV and was constructed in the L.H.IIIA period.

This had been later extended, presumably in L.H.IIIB, when a small room with more roughly built foundations was added, together with a drain. These later foundations abut against, but do not bond with, a corner of the original building. The associated debris and floor levels have been mostly lost, so that L.H.II and L.H.IIIB pottery occur together. But part of a pithos set into a stone-paved floor is in place (Pl. 41, c).

It is thus clear from the 1959 and 1969 trials that in later Mycenaean times there was a considerable area of settlement on this eastern spur of Nichoria ridge, but the walls seldom survive to any appreciable height. In many places they have been totally destroyed and only traces of the contemporary floors survive. Rubbish deposits attesting to earlier occupation underlie these remains in many places, but walls of the early Mycenaean period are few. There is also scanty evidence to show that here, as in the center and northwest of the ridge, there was some habitation both in the later M.H. phases and in L.H.IIIC and even Protogeometric times.

SUMMARY

The 1969 campaign not only demonstrated the effectiveness of the geophysical instruments in testing a new site but it also provided a solid basis for selecting the most vital fields for purchase and systematic excavation in later seasons. We were also able to make at least a rough estimate that something like 80 percent of the approximate 50,000 sq. m. on the hilltop had been built over in one or more phases of prehistoric times. Furthermore, the test results yielded a fair idea of the general history of occupation. Our main regret was that, even with an intensive 8-week digging season, we had not sufficient time to check deeper levels in some test trenches.

There must have been an Early Helladic settlement either on the ridge itself or near by, since the inhabitants in Middle Helladic times kept E.H. potsherds in their homes. Bases of sauceboats were apparently particularly effective spindle whorls. Habitation in the earlier M.H. phases seems to have been concentrated in the central saddle of the ridge (roughly limited to grid L23). A deep gully, which we ourselves used to reach the ridge top, provides reasonably easy and direct access to this area from the fertile Karia valley to the east. In later M.H. phases habitation spread to the northwest acropolis (Area II) and there seem to have been a few houses at least in Area VII.

By early Mycenaean times the center and northwest appears to have been built over fairly thickly, and there was another nucleus at the southeast end (Areas VI, VII). Indications are that in late Mycenaean times the town continued to thrive, particularly in L.H.IIIA. Evidence for heavy population in L.H.IIIB was not plentiful, though widely scattered.

It was (and still is) unclear whether the ridge top between Areas IV and VI was ever occupied. It is almost certain that no remains of habitation exist there now, but severe erosion might account for their disappearance. This is, indeed, very largely the case in Area VI which we are quite sure was built over in Mycenaean times.

As for settlement in the early Iron Age, the meager evidence from the 1969 tests proves in retrospect to have been misleading. The existence of the Protogeometric cemetery to the northwest had led us to hope that Nichoria would be one of the extremely rare habitation sites so far known where habitation had been continuous through the transition centuries from second to first millennium B.C. But, while a small amount of L.H.IIIC and Protogeometric pottery was recovered and we had the Geometric pithos burial, none of this material could be definitely associated with structures. It was not until the 1971 season that all doubt was dispelled about occupation in the Protogeometric and Geometric periods.

It was already clear in 1969 that the site was essentially deserted in Archaic, Classical, Hellenistic and Roman times, although there is a fair amount of evidence for continuous exploitation of the same rich agricultural resources. For example, a village of Roman times was located at the south foot of the Nichoria ridge. The big building near the southeast end of the ridge in Area VI was clearly post-Roman but could not be dated closely. The only hint at that time was that the abundant roof tiles found in the ruins closely resembled those used to cover graves cleared by Choremis on the little hill of Tripetorachi which lies slightly southeast of Nichoria; the scanty offerings found in these graves seemed to belong to Byzantine times.

As for our secondary aim, we had theorized (partly on the basis of the 1959 tests) that the southeast acropolis (Area VI) had been the site of the "royal residence" that presumably existed somewhere on the ridge. For that reason we tested this part of the ridge particularly thoroughly, but with inconclusive results. There is considerable late Mycenaean pottery still scattered about, and masses of debris (including bits of painted plaster) were thrown or washed off its south edge. But it seems that now not one block of building foundations earlier than the big medieval structure remains upon another. The likeliest conclusion is that the Mycenaean buildings that once stood here were largely erased by erosion before the Middle Ages and that then the hilltop was leveled and the remnants of earlier structures re-used.

THE 1970 AND 1971 CAMPAIGNS

INTRODUCTION

Since intensive excavation was essentially concentrated in the same areas in both 1970 and 1971, we have decided to make a cumulative report on the results and also to include in this section a discussion of the pottery and small finds from 1969. The 1970 digging season was from June 8 to July 18, with a staff of nineteen and an average of 20-25 workmen.⁹ The foreman was again Georgios Anastoulis and our

⁹ The senior staff included the director, associate director, Stanley Aschenbrenner (logistics), Bryan Carlson (photogrammetry), Strathmore R. B. Cooke (metallurgy, lithology), William Coulson (excavator), William Donovan, Elizabeth Milburn, Roger Howell, Elizabeth McDonald (secretary), Edwin Oshier (photography), Leslie Rimer (conservationist), Nancy Wilkie (exca-

liaison with the Greek Archaeological Service was Miss Theodora Karayeorya, ephor for western Peloponnese.¹⁰ In 1971 we scheduled the same 6-week digging season, plus a follow-up study week. The staff was considerably larger (27), the number of workmen averaged about 35, and the same eminently satisfactory liaison was maintained with the Service.¹¹

Before beginning the 1970 season we had acquired, through the American School in the name of the Greek state, the Papamichroulis field. It is naturally divided into the northwest acropolis (designated Area II) and a lower sector sloping down toward the east and south (Area III). In the course of the season we also completed the purchase of the Kaisareas field in the saddle toward the center of the ridge (Area IV). Digging proceeded throughout the season in Area II, supervised by William Donovan, and in Area III, supervised by Richard Hope Simpson. Roger Howell began work in Area I, immediately below the western acropolis, but since the land we then owned restricted its proper continuation, he transferred to Area IV as soon as it became available.

In 1971 digging continued in Areas II, III, and IV under the same supervisors, with Nancy Wilkie in charge of a separate operation in Area II and William Coulson in Area IV. In addition, the purchase of a third field immediately below (west of) the acropolis made possible the expansion of the operation in Area I that Howell had begun the previous year. The supervisor here was Thomas Shay.

AREA I (Fig. 5)

Area I is at the northwest end of the ridge in grid J25. It comprises a steep and heavily eroded northern slope and an eroded but more gently sloping western face (Pl. 42, a). Extensive excavation here was designed to uncover information bearing on the approach to the ridge from the highway in the pass immediately to the north and to investigate possible fortifications protecting this approach. Surface indications showed several massive blocks at the base of the slope, appropriate in size and orientation to a wall and tower complex. A small excavation by Howell in 1970 at the base

vator. Patricia Donovan was house manager. Angeline Lieber provided liaison with Kalamata. Ford Fellows were Robert Black (photography), Corliss Bodley (small finds), Mark Ketcham (excavator), Ingeborg Westfall (animal bones). Sarah Lund was pottery assistant.

¹⁰ We are indebted to the ephor and her capable staff for extraordinary efforts to make our work harmonious and effective.

¹¹ The staff included the director, associate director, Stanley Aschenbrenner, Robert Black, Bryan Carlson, William Coulson, Oliver Dickinson (pottery), William Donovan, Patricia Donovan, Richard Hope Simpson, Roger Howell, Elizabeth McDonald, Leslie Rimer, Thomas Shay (excavator,) Jennifer Shay (botanist), Nancy Wilkie, Donald Wolberg (animal bones). Ford Fellows were Duane Bingham (photography), Corliss Bodley, John Kovacs (excavator), Suzanne Martin (pottery). Jay Griffin assisted with photogrammetry, Jennie Hope Simpson with excavating, Sarah Lund with pottery, Lucy Weier with conservation. Lyle Folkstad was staff artist. Aris Poulianos, physical anthropologist, worked with us for two weeks.

of the slope in the western half of grid Ucd was confined to expedition-owned land. It revealed part of a heavy rubble wall with straight outer face oriented from northwest to southeast. Howell also uncovered two arcs of a circular stone structure about 2 m. in diameter which was in part overlaid by the wall, and the legs of a human skeleton at the southern edge of the circle. Work was discontinued at that point and plans made to purchase the adjacent property so that the wall and associated structures could be more fully probed in 1971.

The 1971 operation here, under the supervision of Thomas Shay, commenced on the west slope of the acropolis in attempts to understand its erosional history. All traces of prehistoric remains had been washed from the upper slope and the thin debris overlying the lower slope contained a mixture of sherds dating from late M.H. and L.H. times. Midway down the slope, mainly in Vcd, remains of a curved wall about 1 m. thick and 3-4 courses high were uncovered. This wall was at first thought to have supported a terrace above the major fortification complex below, but later discoveries suggest that these foundations may represent a fortification wall in its own right (Pl. 42, a).

The narrow trench in Ucd excavated in 1970 was reopened and extended eastward in the steep fill to reveal the nearly complete arc of the circular stone structure. The burial to the south of it was removed, and several other squares were opened to south and west at the base of the slope.

This work revealed that, instead of a fortification complex, the heavy rubble foundation at the base of the slope is part of the packing wall of a tholos tomb. Although the tomb is poorly preserved on its lower western side and its excavation has only begun, a few comments can be made at this time. It is approximately 6 m. in diameter at the level of the lintel, a large limestone block in the southwest corner of grid Ub (Fig. 5). The inner curving face of the tomb chamber is constructed of large dressed limestone slabs sealed with clay mortar. The dromos was partially excavated by Nancy Wilkie in grids J24 Uy and J25 Ua. It is about 2 m. wide and 7 m. long and faces southeast down the valley toward the sea. It is lined with dressed limestone blocks and has a packed clay floor. The latest of the scanty sherds from the floor and lower fill seem to date to early L.H.IIIA.

The smaller circular stone structure and adjacent single burial were the major foci of work during the latter part of the season. The single burial (Pl. 42, b) belonged to a young girl. Her body was fully extended in a long narrow shallow pit with no grave goods. Pit fill included both M.H. and L.H. sherds. Because several stones of the adjacent circle had been removed to accommodate it, the burial was undoubtedly made after the stone circle; and the fact that her feet were placed against the outer packing wall of the tholos suggests that the burial also post-dates that structure.

The small circular pit, which we are calling the Little Circle, is truncated on

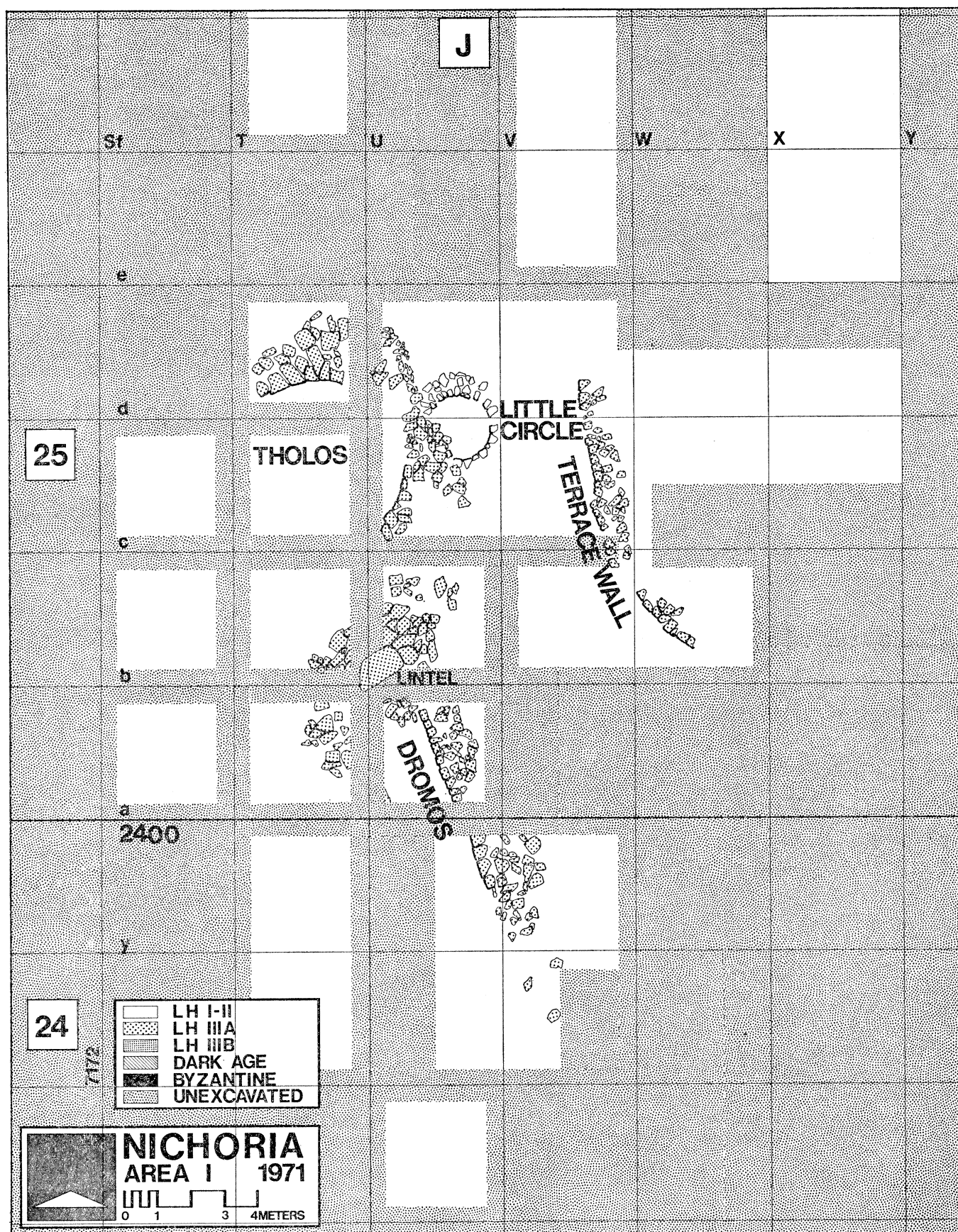


FIG. 5. Area I (Northwest Slope): 1971

the west by the packing wall of the tholos and hence must be earlier. It contained the remains of at least 9 individuals, 4 of whom are partially or fully articulated (Pl. 42, c). Several apparently isolated skulls and disarticulated parts of bodies were also found. All of the skulls are either fragmentary or have been fractured. Most of the remains, examined *in situ* by Aris Poulianos, belong to men and women of various ages who had been thrown or carelessly laid in the bottom of the pit. The cause of death of these individuals is as yet unknown, and violence cannot be ruled out. No grave goods associated with the burials have yet been found. The pottery from the fill is again mixed M.H. and L.H., but a few early Mycenaean sherds found with the bones may help to date the burials. This unusual burial structure and its contents have not been fully investigated. Further interpretation must await the results of the 1972 season.

AREA II = PAPAMICHOULIS WEST (Fig. 6; Pl. 43, a)

This is a flat-topped acropolis about 32 m. north-south by 60 m. east-west occupying the northwest end of the Nichoria ridge. William Donovan supervised the tests here in 1969 and the extensive excavation in the two succeeding seasons. The ground falls steeply to north and south. The west slope (Area I) is more gradual and the main approach to this part of the ridge-top must have been there. On the east the division between Areas II and III is marked by an outcropping of the caprock, with a much more pronounced drop at the south than at the north. The natural access route can be seen in the northwest corner of Figure 7. Area II lies almost entirely within grid K25. An area of 631 sq. m. has now been dug and by the conclusion of the 1971 season almost every section which showed the slightest promise had been excavated or tested.

The soil cover is generally very thin. Indeed there is every reason to believe that the ground level in the eastern and southern portions of the area is now considerably lower than it was in antiquity. It was difficult, therefore, to discover deposits where the stratigraphy was clear and undisturbed. A preliminary study of the results makes possible the following tentative reconstruction of the chronology. Remains of house walls dated to the late 10th or early 11th century after Christ (on the basis of ceramic, numismatic, and C14 analysis) mark the most recent habitation. Scattered sherds of Dark Age pottery came to light but no walls could be associated with them. Most of the architectural remains belong, on the evidence of the pottery, to two phases of L.H.IIIA/B. Two retaining walls in grids Kd and Ie and the fill from several deep depressions belong to the early phases of the Late Helladic period. Sherds belonging to a late phase of Middle Helladic from the lowest levels in the northern part of the area comprise the earliest remains; again no structures could be associated with them.

The major Byzantine remains consist of two buildings, probably related. House II-1, in the south central and highest part of the area, appears to have consisted of

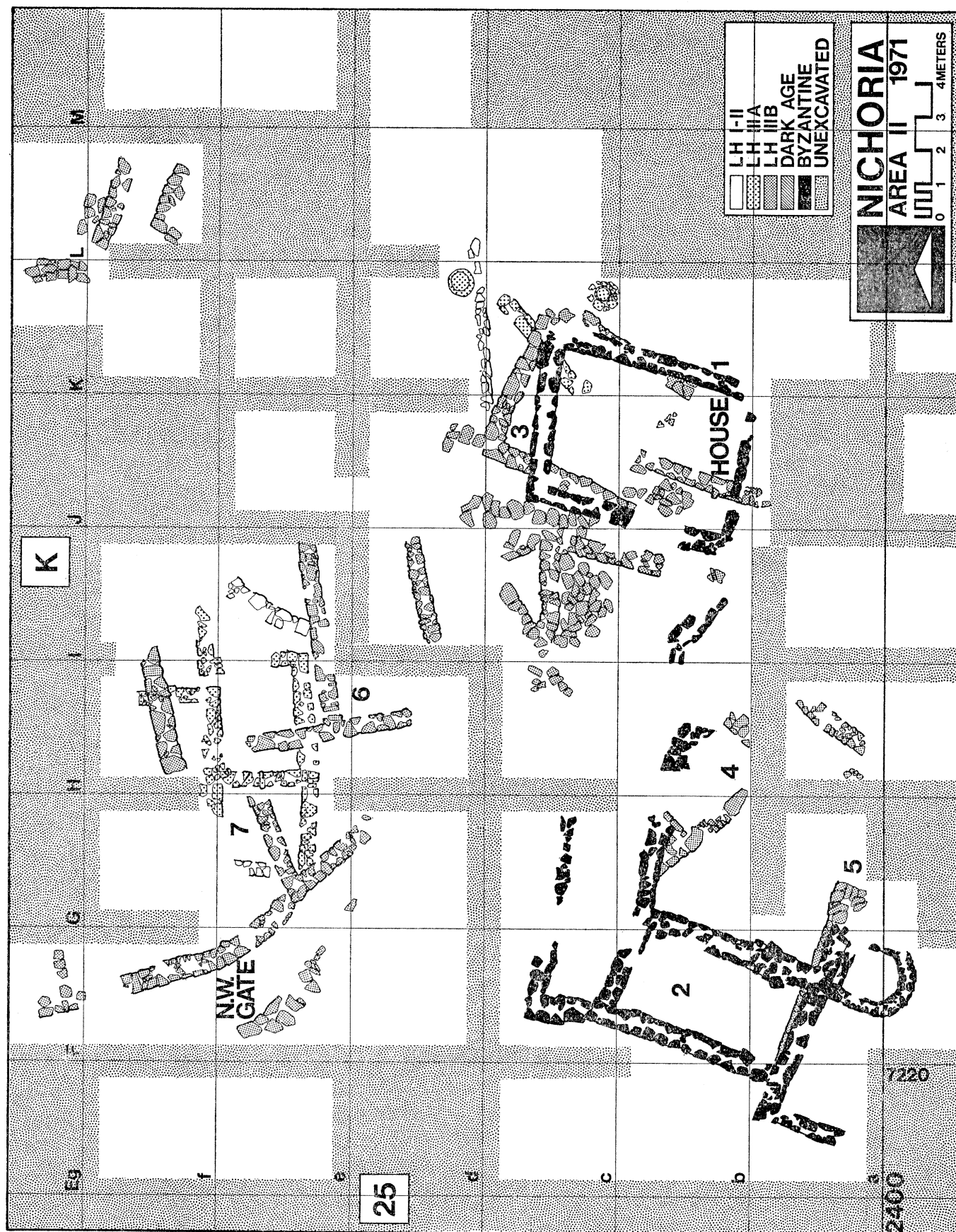


FIG. 6. Area II (Papamichroulis West) : 1970-71

a single large room, 5.40 x 4.15 m. in area (Pl. 43, c). No undisturbed floor was found but many fragmentary roof tiles, iron implements, fragments of glass and pottery were recovered. Further west, only one room (5.10 x 2.56 m.) of House II-2 was completely preserved. Its floor was covered with broken pottery which has not yet been studied. This building had an apsidal addition in which there are many traces of intense heat; clearly it was a furnace of some kind. Quantities of metallic slag found in dumps near these buildings testify to the fact that metal work was carried on here. The lowest course of the Byzantine walls is constructed, for the most part, of large stones set upright to form the face of the wall and the space between is filled with earth and stones.

From L.H.IIIA/B, walls belonging to five separate houses were tentatively identified. Intelligible foundations have been recovered only along the north edge of the area (Houses 6, 7) and under the later Byzantine buildings (Houses 3, 4, 5). No complete plan is preserved nor were there any floor deposits. The most extensive remains are those of House II-3 which were discovered when the walls of House II-1 were removed (Pl. 43, c). They consist of an almost square room (3.85 x 3.75 m.) to the west of which there is a drain covered with thin slabs of stone extending to the north. Further west there is a sunken area (as yet unexplained) with stone-flagged floor (Pl. 43, b). The latter had been filled with debris dating to L.H.IIIB when the Mycenaean house remains seem to have been leveled before the construction of the Byzantine building. No clear association has been established for the two pithoi sunk deeply into the ground in grids Kc and Kd.

Enough evidence is preserved, however, to suggest that the acropolis was fairly densely built over with modest houses during L.H.IIIA/B and that these houses were not laid out according to any detectable overall plan. There are traces of a path or street leading up toward the center of the acropolis from a small gate at the northwest corner. The street probably looped back in a northeasterly direction toward Area III, thus marking off a northern and a southern group of houses. The fact that house walls are abruptly broken off in places along the present northern and southern edges of the hill proves that some of the original surface has been lost to erosion. As mentioned above, evidence on possible fortifications is as yet inconclusive.

During the early stages of the Mycenaean period the surface of the acropolis was pocked by several depressions and leveling for building was assisted by retaining walls, two of which are partially preserved. These depressions were filled with broken pottery, animal bones, carbonized wood, and other debris. The material beneath House II-3 forms a closed deposit and from its fill were recovered many chunks of clay, hardened in a conflagration, which preserve traces of the impressions of branches or reeds. This material may well come from walls or roof of a building destroyed during that period.

AREA III = PAPAMICHOULIS EAST (Figs. 2, 7; Pl. 44, a)

Area III is considerably larger than the contiguous northwest acropolis (Area II), occupying the southeast quadrant of the K25 grid and the northern part of K24. We have evidence that before M.H. times there was a deep gully extending into the center of Area III from the south, so that then the acropolis would have been a much more clearly delineated unit. Subsequently the wash from above, both west and east, filled in and smoothed out the contours, so that below a cliff of caprock (grading down from about 5 m. at the south to practically zero at the north) there is now a gentle slope to the saddle in the middle of the area, and then a gradual rise again to northeast, where the northern part of the North Veves field is again considerably higher. Richard Hope Simpson has been in general charge here in all three seasons, and in 1971 Nancy Wilkie supervised digging in grids K25 RUeh.

At the northwest corner, i.e. near the edge of the ridge, an easy slope connects the acropolis with the "lower town" (Area III). We will begin with the results in this sector. The earliest habitation evidence is a late phase of M.H., represented by the lowest deposits in K25 NOef (falling between the areas shown in Figs. 6 and 7). Most of the rubbish in this large pocket, however, was of somewhat later date. Above the pocket were the scanty foundations of two parallel walls of the L.H.IIIA2 or L.H.IIIB period (Pl. 44, c). The *terminus post quem* is given by L.H.IIIA2 sherds between the western wall foundations and the caprock. Immediately below the northeast corner of the east wall a small disturbed slab-covered cist grave was found, apparently an infant burial and presumably of Late Helladic date. It should be associated with the two infant burials reported from trench II in Area II. In grid Ne a well-built stone-lined rectangular grave, about 1.50 x 0.50 m. and 2 m. deep, was discovered. The backfill consisted of small- to medium-sized stones and tiny amorphous L.H. sherds. It resembles the type of shaft grave popular in the L.H.I period, but there is no means of ascertaining its exact date since it was found completely robbed out (Pl. 44, b).

In the northwest sector of the lower field there is little depth of earth above the bedrock. To the south and southeast, however, the bedrock is more deeply buried. The walls and floors of the Mycenaean house III-2 (Pl. 46, a) are built partly on and into outcropping caprock, and partly onto M.H.-L.H.II rubbish deposits. The greatest depth of wash (about 5.40 m.) is in the center of the field. In trench K24 Xuv the lowest 4 m. consisted entirely of late M.H. fill. The next level, consisting of M.H.-L.H.I debris, becomes increasingly thick as one moves up the slope to the north. The uppermost rubbish level is M.H.-L.H.II/IIIA and is considerably thinner, presumably because it has been cut into by L.H.III buildings as well as by natural erosion. No certain M.H. walls were found, and only a few traces of wall foundations have been uncovered of periods prior to L.H.III. Some of these may be L.H.I or L.H.II, if we are to judge by the pottery immediately overlying them. They must in any case be earlier than the main L.H.IIIA2-L.H.IIIB building phase in the area.

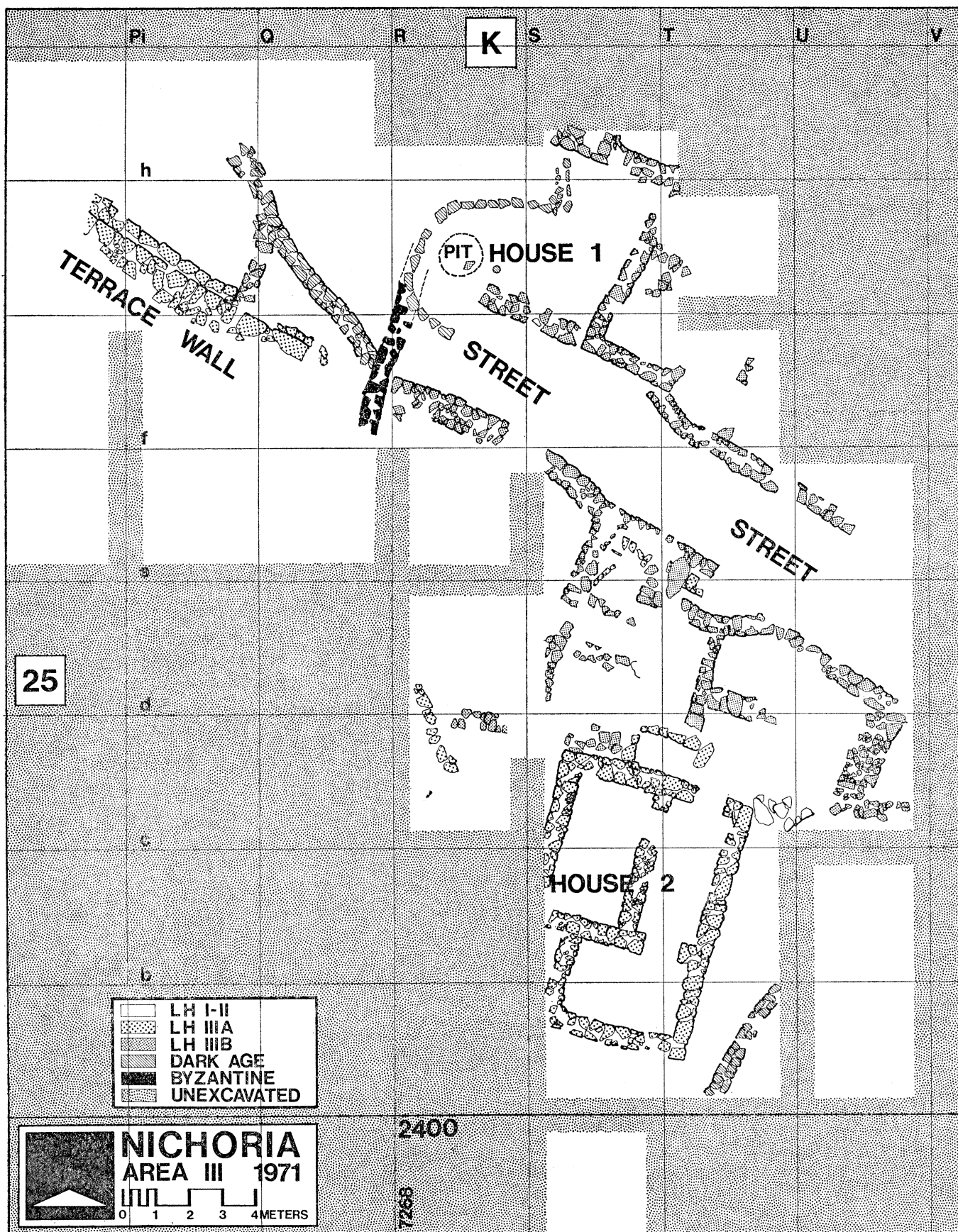


FIG. 7. Area III (Papamichroulis East) : 1970-71

An important street was explored for a considerable part of its length, from grids Rf to Ucd, and it is clear that it originally continued further to the northwest as well as to the southeast. Its surface lies approximately 0.40 to 0.60 m. below modern ground level and consists of highly compacted earth in which many small stones and sherds have been embedded. At several points, however, the caprock lies exposed and seems to have formed part of the street surface. A great deal of debris lay above the street, consisting mainly of large limestone blocks which at one time were incorporated in the walls bordering on both sides of the street. The earth associated with the stones was generally dark and loose. The pottery associated with the debris is mainly L.H.III, although it ranges in date from L.H.IIIA2 to Dark Age. Since the majority of the sherds appear to be L.H.IIIB with a few L.H.IIIC intermingled, it is assumed that the period in which the street received its greatest use was L.H.IIIB, although it probably originated as early as the L.H.IIIA2 period. A large deposit of carbonized material found lying directly on the street has yielded an uncalibrated C14 date of 1040 B.C. \pm 90 (below, p. 266).

Above the debris over the street was a thin and intermittent level of more compacted soft brown earth and smaller stones, which contained L.H.IIIB, L.H.IIIC, and Dark Age sherds. This level surely represents a phase contemporary with the construction of House III-1. It is clear that at that time the stone tumble which had fallen onto the street formed a very uneven surface and probably still lay partly exposed. In order to provide a level surface for the floor of House III-1, a layer of smaller stones and earth was laid down. This was apparent not only on the line of the former street within House III-1, but also outside it to northwest. A fairly thick Dark Age level was also observed in the upper parts of grids Tcd and Ucd.

The street (Pl. 45, b) was flanked by the exterior walls of structures of various periods in L.H.III.¹² The original structure on the northern side of the street seems to have been that represented by the foundations in grids Sf and Sg. For the most part these foundations are preserved to a height of only one or two courses, while at the northern end of the structure the caprock lies almost immediately below the surface and the walls have disappeared almost entirely. The approximate dimensions of the original structure outlined by these foundations are 3 x 6 m. Later additions were made on both the eastern and western sides of the building, either as an enlargement of the original structure or as new structures sharing its walls. Since the floors of these buildings have been lost, dating is difficult. It appears, however, that a date in L.H.IIIB is indicated for all of the Mycenaean building activity on the northern side of the street.

On the southern side of the street the original structure in grid Se was probably

¹² The Mycenaean street and the structures flanking it are comparable to features discovered in the underwater exploration at Pavlopetri, near Elaphonisi in Lakonia (*B.S.A.*, LXIV, 1969, pp. 113-142; cf. *Archaeology*, XXIII, 1970, pp. 242-250).

erected during the L.H.IIIA2 period, but the meager foundations of this building now underlie the foundations of a later L.H.IIIB structure. This later building contains a large threshold block at its entrance (about 1.30 x 0.50 x 0.10 m.) which has a depression near its north edge for a door pivot. Immediately inside the threshold is a small room, approximately 1.50 x 2 m., which presumably served as an entrance hall. Later additions were made to this building during L.H.IIIB when its northern wall was extended along the street to the northwest. This later wall may have been merely a terrace or retaining wall. To the south of it is a great depth of M.H. and L.H.I-II debris which has not been fully explored.

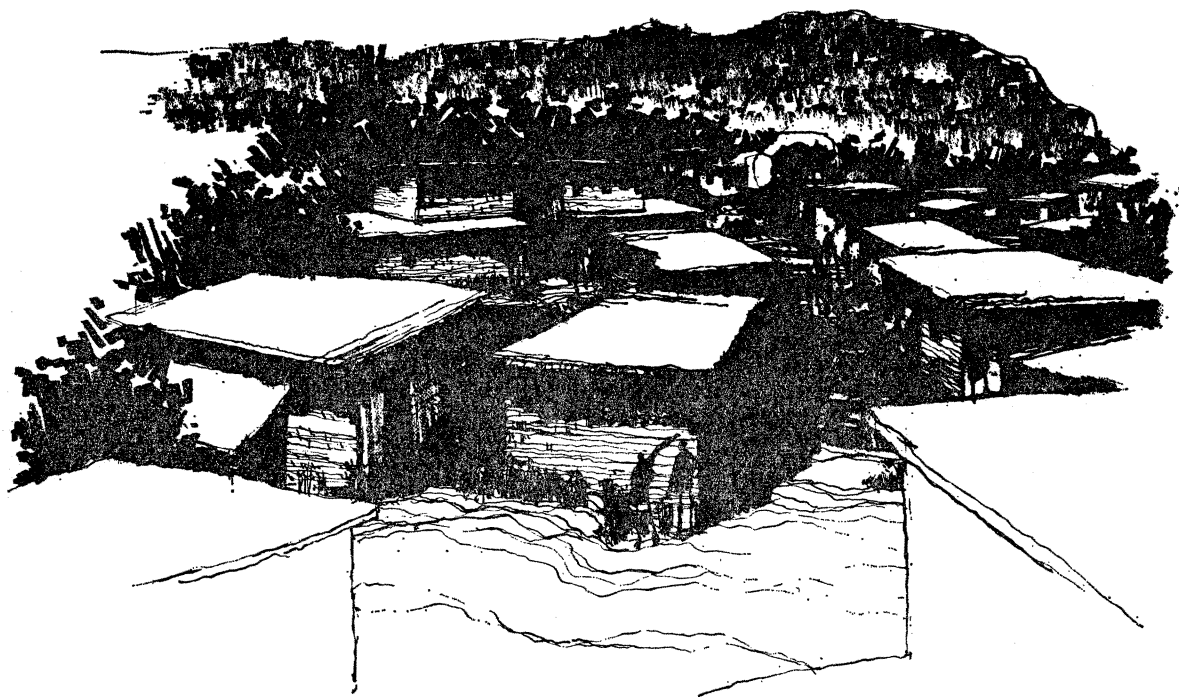


FIG. 8. Area III, looking Northwest along Mycenaean Street (drawn by L. Folkstad)

The buildings adjoining the south side of the Mycenaean street in grids Tcd and Ucd also seem to belong to the same L.H.IIIB phase. But so little remains of the walls that the exact ground plan remains uncertain. The wide wall in grid Uc may have served as a common wall for two adjacent buildings. In grid Tc there was evidently a small exterior courtyard, giving access both to the structure on its north and also to the large Mycenaean house III-2 to the south. This courtyard was contemporary with the upper (L.H.IIIB) floors of the house.

Figure 8 is a reconstruction by our staff artist, Lyle Folkstad, of the view in L.H.IIIB as one looked up the street from a point approximately in grid Vd. House

III-2 was first discovered by the 1969 trench K25-III, and fully explored in 1971. It consists of three main rooms and a long narrow exterior construction on the north (Pl. 46, a). The western portion of the house was cut partly into the caprock, while the eastern and northern walls and floors were built over the M.H.-L.H.II/IIIA debris described above. The main walls of the house are 0.55 to 0.60 m. wide and are preserved to a maximum height of 1.24 m. in the northwest corner. It is clear that subsidence of the debris caused corresponding sagging in the floors, necessitating rebuilding or remodeling of the floors and doorways during the life of the house (i.e. from L.H.IIIA2 to L.H. IIIB1 inclusive). The heavy debris which fell onto the floors after the house was destroyed caused further unevenness. The floors are best preserved near the walls, where they have been partially protected against the weight of debris from above. Two floor levels have been identified. The lower floors, about 0.15 m. thick where measurable, were laid only a little above the level of the foot of the walls, and roughly on a level with the contemporary ground surface outside to the east. Although there were no undisturbed floor deposits, in places pithos fragments and other pottery lay directly on the floors, especially in the north doorway of the east room and in the east part of the south room. The overall evidence indicates that the lower floors belong to the L.H.IIIA2 period. At this time the main doorway of the house, at the northeast corner, may not have had wooden door jambs, but the slabs at either side of the doorway into the south room do seem to have been bases for such jambs. Similar wooden door jambs must also be assumed to have stood in the original doorway into the northwest room.

The second phase of occupation is indicated by the laying of the higher floors. There is little trace of any accumulation of deposits between the two floor levels. The upper floors, as well as the debris immediately above them, contained mainly L.H. IIIA2 pottery with some L.H.IIIB1. In the exterior structure at the north, however, some tumbled stones and fragments of a pithos rim occurred between the lower and upper floors. Both this intermediate deposit and the higher floor here yielded some L.H.IIIB1 pottery. The walls of this structure have no clear outer face, so that this room was clearly dug into the pre-existing debris. Its lower floor was thus at least 0.40 m. below the contemporary ground level on the north and west. This structure may have been used as a storeroom.

The wall between the west and east rooms of the main building was remodelled when the later floors were laid and at that time the base for the original door jamb on the north side was covered over. On the south side of the doorway a wooden post was installed (Pl. 46, b). A sample of this carbonized wood yielded an uncalibrated C14 date of 1280 ± 90 B.C. (below, p. 266).

No undisturbed deposits were found on the later floors, although some fine objects were recovered. It appears that, although the debris which later fell into these rooms contained L.H.IIIA2 and L.H.IIIB1 pottery throughout, two phases of destruction

can be distinguished. The earth over the floors inside the house was of a light brown color shading to dull white and of a stiff consistency, differing markedly from the dark brown and looser earth outside the walls. The lower 0.50 m. of inside debris consisted of somewhat looser earth, while above that level the earth was harder and mixed with a greater proportion of large- and medium-sized stones. This suggests that the upper walls were mainly of mudbrick. Perhaps there may even have been a partial or full upper storey built of such material, and there are indications that the partition between the eastern and western rooms on the ground floor was not built entirely of stone. Then, the upper debris might mark the final collapse of the lower walls which contained the stone that sealed the destruction level.

There is no clear indication of how the house was roofed. As elsewhere on the site, tile fragments are totally missing in the debris. If there was an upper storey, access would have been easiest at the northwest corner where the contemporary outside ground level was approximately 0.90 m. higher than the lower floor of the western room. There is no direct evidence for a stairway, unless the exterior structure at the north somehow served to support it.

The original Mycenaean street surely continued further to the northwest and it must be assumed that the massive Mycenaean terrace walls in grids Og, Pg and Qf once formed its southern boundary here. The *terminus post quem* for this terrace wall is given by the contents (L.H. IIIA2) of the packing found between it and the caprock against which it was set. The wall may have originally continued to the northwest, and it may also have served as the exterior wall of a house or houses to the southwest of it on the upper level. In places the wall is preserved up to three courses (about 0.55 m.) above the top of its foundation course, which is about 0.40 m. wider than the upper courses on the northeast side. This projection was apparently covered over at some stage in the use of the street.

The west end of the original Mycenaean street was blocked or diverted in later periods, as is evident in grids Pgh and Qfg (Pl. 45, a). A north-south wall cut into the projecting lower course of the terrace wall. This crosswall is clearly associated with the remains of a floor of L.H.IIIB1 date immediately to the east. Presumably therefore, by the L.H.IIIB period if not before, the street had been diverted to run north of its original line. The crosswall was in turn cut into by a later wall (in grid Qg) which runs from northwest to southeast and overlies Mycenaean debris. The debris associated with this later wall consists of smaller stones and earth, and in places it fills up pockets in the more massive and uneven Mycenaean debris below. Since it contains a mixture of Mycenaean and Dark Age pottery, it seems to have been deposited at some time in the Dark Age, most probably at the time of construction of House III-1 that lies to the east.

The apsidal structure, House III-1 in grid Rg, was built directly above a Mycenaean wall which formed the northern boundary of the street (Pl. 45, c). A layer of

small stones and earth was laid down on top of the Mycenaean debris to provide a more even surface for the floor. The orientation is east to west, with the apse toward the west. The interior dimensions are approximately 3.75 m. north to south by 4.00 m. east to west. In no place is this wall more than one course high or more than a single stone in thickness. It is possible, therefore, that these are not really wall foundations, but that the line of stones simply defines the shape of the building. If so, the actual walls of the structure must have been of some lighter and more perishable material. Delicate scraping of the earth in minute levels and varied methods of photography (including IR) yielded no evidence on this point. The northern portion of the apsidal row of stones appears to be preserved in its entirety. At the east end the stub of a wall seems to turn north at right angles to it. The purpose of this wall is unclear. The southern portion of the apsidal wall ends just as the curve of the apse begins to straighten. The rest of this side seems to have been destroyed by erosion and cultivation.

Associated with the apsidal building is a pit which lies approximately on the long east-west axis of the building and toward the apsidal end. The pit is about 1.30 m. in diameter and about 0.30 m. deep. On approximately the same axis and a little further east is a posthole about 0.15 m. in diameter and 0.10 m. deep. It probably marks the base of a wooden support for the roof.

The building definitely belongs to the Dark Age since it overlies a Mycenaean structure, but its exact date within this period is difficult to determine. The floor level lay so close to the modern surface that it has been destroyed by cultivation. It is possible, however, that the building may be as early as Protogeometric times. A fair number of sherds of this period were found in the pit fill and other debris within the building, generally mixed with other sherds from the Mycenaean and Geometric periods. There do not seem to be close parallels from other sites that would aid in assigning a close date to House III-1. Another house of Dark Age date may be represented by a wall that is beginning to appear in grid Ta.

The only later building activity so far discovered in Area III is a field wall (probably Byzantine) in grids Qf and Rfg. A portion of it overlay the apsidal end of House III-1. Byzantine sherds were found in the uppermost level of grid Tcd; and Byzantine glass fragments at a depth of 0.40 m. below modern surface in grid Uxy indicate a mixed level here.

AREA IV NORTH (Fig. 9; Pl. 47, a)

Area IV is the new designation for the Kaisareas field. Excavation in the northern sector (the east central part of grid L23) was supervised by Mark Ketcham (1970) and by William Coulson (1971). Here the modern surface is fairly level, with an easy slope downward from east to west and north to south. Digging in the southern sector (the southeast part of grid L23) was supervised by Roger Howell in

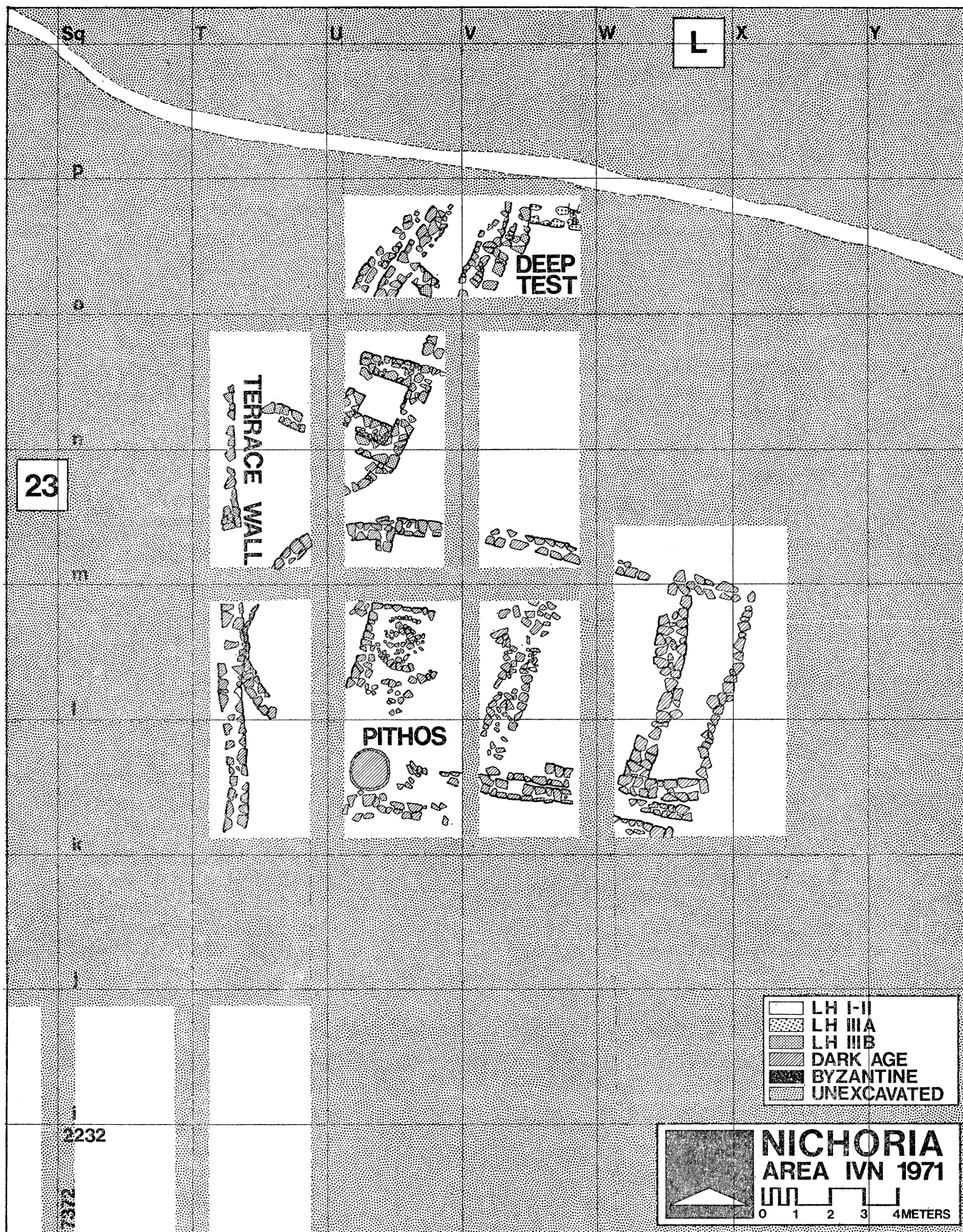


FIG. 9. Area IV North (Kaisareas) : 1970-71

all three seasons. Here the modern surface slopes somewhat more steeply toward the south edge, where a deep gully cuts into the ridge.

The most important architectural discovery in this area was the foundations of a large apsidal building of the Early Iron Age. It occupied all or part of grids L23 TUVW klm. The long axis of the building is approximately east-west, although it faces slightly to the south of due east. One of the largest of its kind so far discovered, it measures 13.60 m. in length and 8.00 m. in width. It seems to have been divided into three rooms by two crosswalls. Near the east end, spur-walls return at right angles from the side walls, and there was a central doorway approximately 1.34 m. wide. The foundations of these spur-walls are quite thick (0.90 m.), and there may have been a central horizontal beam for added structural support in bearing the weight of the wide roof span. The foundations of the southern side wall at the east end are also of unusual thickness (1.20 m.). Although further study is particularly necessary in this part of the building, the apparent double structure might again suggest accommodation for a wooden beam.

The east doorway does not appear to be exactly centered on the long axis. Six large flat worn blocks are still in place in this vicinity. They are at approximately the same level as the floor just inside the doorway, which consists of hard-packed yellowish soil mixed with small stones. These stones may once have formed a cobbled floor but are now very much disturbed. The side walls of the building continue to the east beyond the spur-walls and seem to form a shallow porch with a single line of stones delineating the eastern limit. Excavation will continue here in 1972, and conjectures at this point are premature. Some of the blocks could have served as bases for wooden columns or posts, thus providing a façade for the front of the building.

The northern sector of the central room contains an interesting feature in the form of a cobbled circular area about 1.60 m. in diameter (Pl. 47, c). Its function is as yet unknown.¹³ It is bounded on the north by a single line of flat stones and on the west by the foundations (some three courses deep) of the crosswall between this room and the apse. Immediately to the south of the circular construction, a few scattered flat stones indicate that there may have been a second circle which was robbed out at a later date when a large pit for two pithoi was dug. A portion of the outside south wall, approximately 5 m. in length, was also destroyed by this pit, and a pithos about 1.15 m. in diameter was sunk directly in its former line. The floor on which the circular paving rests is at a somewhat higher level than the floor of the western apsidal room. Such split-level construction would be a means of adapting the building to the easy slope downward toward the west. Lying on the floor near the paved circle

¹³ The closest parallel occurs at Lefkandi where circular construction with two slots running across their centers have been named "Theta structures" by the excavators (M. R. Popham and L. H. Sackett, *Excavations at Lefkandi, Euboea*, London, 1968, p. 30). No such grooves are visible in our example.

were a considerable number of animal bones (ox, sheep/goat) together with small fragments of bronze. The apse at the west end was in part overlaid by a later north-south wall. The excavated portion measures 12.50 m. in length. The associated pottery also suggests that this wall (terrace?) was probably constructed in a somewhat later phase.

The foundations of both later wall and apsidal building consist of fairly large undressed flat stones, usually of only one or two courses and nowhere reaching a height of more than four courses. The foundations of the building seem to have been reinforced only on the southeast side; elsewhere, their average width is 0.50 meters. Fragments of mudbrick were found both inside and outside the building, suggesting that the upper walls were of brick or half-timber construction. A few pieces of plaster may indicate that the walls were plastered on the inside. The roof may have been constructed of light materials such as bamboo and thatch and supported by props resting on tie beams which spanned the space from wall to wall. Because of the extraordinary size of the building, it is questionable whether it was roofed in its entirety. The central room with the circular paved floor may have been left open to the air.

The monumentality of its dimensions, its east-west orientation, the porch at the east, the tripartite arrangement of rooms, and its apsidal shape inevitably raise the possibility that it was a temple.¹⁴ In any case, it must have been the most important building of the town in that period. Other possibilities are that it was the home of the local "chief" or some sort of communal center. The small finds from inside and close to the building are not especially helpful in determining its function. The most important are described in a group (below, p. 264).

The chronology of the apsidal building, the north-south wall, and the pithoi has not yet been worked out satisfactorily. Both building and north-south wall have the same flat foundation stones that seem to characterize Dark Age construction. An amphora fragment with rope handle was found on the floor to the west of the paved circle. Such handles in East Greece belong in the middle Geometric period. Since the north-south wall and pithoi must post-date the building, they should date near the end of the Protogeometric lag in south Peloponnese; but the associated pottery so far suggests that they are older than the contents of the pithos burial found in 1969 with contents that can be dated to the late Geometric period, about 725 B.C.

¹⁴ Of the known major Geometric apsidal buildings, several are longer than ours but none exceeds it in width. The closest parallel would seem to be the 9th century B.C. Temple of Hera Akraia at Perachora (H. Payne, *Perachora*, I, Oxford, 1940, pp. 27-34). Comparable foundations or terracotta models occur at Aegina, Ithaca, Antissa, Eleusis, Gonnos, Homolion, Lefkandi, Mycenae, Samos, Old Smyrna, Thermon. The recently discovered foundations at Eretria (*A.J.A.*, LXXV, 1971, p. 302) measure 7.50 x 11.50 m. According to the excavator, this may not be a temple proper, but a shrine dedicated to Apollo Daphnephoros and built of laurel in imitation of the mythical temple at Delphi.

To the north of the apsidal building and at a somewhat lower level we are uncovering substantial foundations that seem to belong to a L.H.IIB house complex. The only room that has been fully excavated (in grid Un) is only 1.25 x 1.12 m. with an especially heavy wall (1.10 m. thick) to the south and a doorway with threshold blocks to the west. This structure may have carried the weight of a stairway to a second floor, with the little room on the ground floor serving as a storeroom or stable. In the eastern part of the northernmost trench (grid Vo) a deep test to bedrock produced evidence of a complex of walls from different periods and stratified pottery belonging to Dark Age, L.H.IIB, L.H.IIA2, L.H.IIA, and L.H.IA/IB periods (Pl. 47, b).

AREA IV SOUTH (Fig. 2; Pl. 47, a)

During the 1970 and 1971 seasons nine trenches were opened in this area, under the supervision of Roger Howell. They were each 3 x 7 m. and contiguous in two east-west rows. Their grid designations are L23 Ofg, Pfg, Qfg, Rfg, Sfg and Tfg (southern row), Rhi, Shi and Thi. Bedrock was reached in only two trenches, Ofg and Pfg (southwest corner of excavated area). In the northwest corner of Ofg it was found 1.04 m. below the surface, and from that point it sloped down toward the southeast so steeply that in the northwest corner of Pfg it was found at 2.14 m. below the surface and on the east side of the same trench at 3.28 meters. From this point it seems to have leveled out toward the east, but a slight drop from north to south can be observed. Obviously, the original configuration of this part of the ridge was quite different from that of today.

Immediately above the sloping bedrock in trench Ofg was a layer of M.H. material; a little was also found above the bedrock in Pfg, though here it was mixed with L.H.I. The L.H.I sherds, as well as the large number of animal bones that occurred, were in an excellent state of preservation. At the top of the level were two hard-packed surfaces and above that another well-preserved deposit of L.H.IIA date, in which several pieces of pumice were found (below, p. 267). During this period a solidly constructed wall was built running northeast-southwest at the foot of the steep slope up to the northwest (Pl. 46, c). It apparently acted as a terrace wall to hold back debris from the slope. It is preserved to a height of 0.90 m. and seems to be about 1 m. in width. No proper face has yet been found on the west, which strengthens the suggestion that it was a terrace wall. During the L.H.IIB period the wall began to fall into a state of disrepair, tumbled stones were found piled up in front of it, and to the east of them a rather coarse-grained sand was deposited. In trench Ofg more L.H.I/II material was found above the M.H. deposit.

During the L.H.IIA1 period, the terrace wall in trench Pfg went out of use. Sherds of this period were found on both sides of the wall as well as above it. In the northwest corner of the trench a mass of yellow silty clay, known locally as

"aspropoulia," was found stretching from the top of the wall up the steep slope. More of it was found in trench Ofg to the west. This clay may once have formed part of the superstructure of the wall or alternately was used as a firm revetment after the wall went out of use. In Ofg another wall, oriented northeast-southwest, was found above the L.H.I/II deposit, and it may have served as a terrace wall during this period but on a higher level.

Above the L.H.IIIA1 deposit in trench Pfg there was a deposit of L.H.IIIA2 material. During this period another terrace wall was built, this time curving round from the northeast toward the northwest (Pl. 46, c). (This is the curving wall that was found in trench L23-V in 1969.) Part of the same wall was found extending across the south end of Ofg, where it ran over the top of the earlier terrace wall there. A few stones in the northwest corner of Qfg (third trench toward east) may form part of its outer edge, for it certainly extends under the baulk between these two trenches. L.H.IIIA2 material was found right to the top of the wall on its inner side. In trench Pfg we were fortunate to recover a fine sequence of material ranging from L.H.I to L.H.IIIA2.

In the northwest corner of trench Tfg (southeast corner of excavated area) a wall was found which appears to turn at right angles into the baulk at its southern end. Another wall, at right angles to it, runs toward the southeast. Both walls belong to a L.H.IIIA2/IIIB level, and possibly delimit a room lying further to the northeast. To the south and outside this building, we uncovered a large mass of the same yellow silty clay as was found above the L.H.II terrace wall in trench Pfg.

Throughout the central part of the excavated area, in trenches Rhi, Shi, Thi, Qfg, Rfg, and Sfg, an exceptionally thick mass of large scattered stones was found and only the upper levels have been examined. Already the tops of several badly ruined walls are apparent. The sherds found in this rubble seem on the whole to be mixed. L.H.IIIC, Protogeometric and Geometric features have been recognized, and an interesting incised green schist plaque was found associated in trench Shi (Pl. 52, e). Over the stone rubble and also in the upper levels of Pfg and Tfg a deposit of hard black sandy soil contained Geometric sherds, though in a very poor state of preservation. A noticeable feature was an abundance of very thin-walled pottery, as well as many pithos fragments. An isolated wall in trench Sfg should belong to this period, and a line of ploughed-out stones in trench Thi may be part of another wall. In Thi and Tfg we detected several patches of carbonized wood, and in Thi a black deposit contained carbonized olive pits and acorns (below, p. 267).

The surface levels in most of these trenches contained a few Byzantine sherds and tile, and one or two pieces of glass were found. The sherds do not seem to be exactly similar to those found in Area II. One piece of sgraffito ware was found in trench Shi. There is a greater concentration of tile at the north ends of trenches Rhi and Shi.

POTTERY

Pottery is as abundant at Nichoria as at most Greek sites, but it has suffered more than usual from adverse soil conditions. A large proportion of the sherds from upper levels are encrusted with salts that are extremely difficult to remove, and only the material from relatively deep strata is well preserved and reasonably easy to clean. At the same time, the site is producing large deposits and long, well stratified sequences. On this basis the successive pottery phases can already be outlined relatively securely. The specialist in Middle Helladic pottery in all three seasons was Roger Howell. In 1969 and 1970 Elizabeth Millburn (now Mrs. Malcolm Schofield), a specialist in Mycenaean ceramics, was in overall charge of the pottery. She was succeeded in 1971 by Oliver Dickinson who has continued to build on the foundations she laid.

MIDDLE HELLADIC

Several deposits containing Middle Helladic material have been found. The best and earliest are in the lower central part of the site, especially in the South Veves and Paraskevopoulos fields. M.H. material in the higher northwest and southeast sectors is later and probably indicates a gradual extension of the original settlement to these areas. Most of the deposits so far found have been in the nature of accumulations of wash on slopes or in pits and depressions. In only two cases, in the central area, were deposits associated with building levels.

The Middle Helladic pottery in general confirms the impression created by the finds from Malthi. It is a markedly local ceramic tradition, differing in many ways from the better known traditions of the northeast Peloponnese and eastern central Greece, though not without points of contact with them. In view of these differences and also because of the nature of the deposits, it would be unwise in a preliminary report to insist on too rigorous a system of classification. For the present we can distinguish clearly between an earlier and a later phase.

The deposits of the earlier phase were found on the western side of the central area. The most characteristic shape is a bowl with a high flaring rim, sharply offset from a narrow sharply curving shoulder, and with strap handles from the rim or the top of the shoulder to the belly (Pl. 48, a). Some strap handles were made by pressing several vertical strips of clay together. Another notable feature is that some of the pots were fired under reducing conditions to produce dark gray or black surfaces which can be regarded as the local versions of Minyan ware. Coarse ware was very frequent, often with black inner surfaces and variegated outer surfaces. Decoration consists of finger impressions on the rim, knobs on the shoulders, and incised patterns. Incised decoration also occurs on finer vessels. (Both of these types of incised ware, together with the plain coarse ware, are classed by Valmin as "Adriatic ware.")

We can already detect in this phase a tendency toward freer patterns with more curvilinear elements than in the incised ware of the later phase. Pointillée decoration is also not uncommon. Some matt-painted sherds of a rather crude nature occur, the paint being applied in thick bands on a light ground or a white slip. The patterns are simple, with the chevron a common element (Pl. 48, c). An unusual piece with fine matt black paint on orange clay may be an import. It is interesting to note that in these levels several ring bases of early Helladic II vessels were found. They had been pierced through the center, probably for use as spindle whorls. Two clay "anchors" of a type usually associated with the E.H.III period were also found. The pottery of this phase, however, indicates that it is probably contemporary with the Early Minyan phase at Lefkandi (M.H.I).

Material of the later phase was found in pits and wash, both in the central area and on the higher northwest and southeast sectors. These deposits frequently contain early Mycenaean material also, showing that they are in general of a mixed nature. It is to be hoped that future deposits will allow us to establish finer divisions of this material. The characteristic features that have been noted so far are: (1) the presence of "Argive Minyan," similar in both shape and fabric to Lakonian and Argive examples; (2) a tendency in the incised "Adriatic ware" toward more regular "wickerwork" patterns; and (3), together with the matt-painted wares, a semi-lustrous painted ware. The latter usually has a light colored sandy clay. Another important feature is the occurrence of sherds of a somewhat gritty clay coated with a crackled lustrous black or brown paint with patterns added on top in red or purple or sometimes white. Some at least are probably imports and betray Minoan influence, perhaps from the direction of Kythera or western Crete. Possibly late features are an increase in the amount of a soft orange fabric and a similar blue fabric which seems to be its reduced version. Both of these fabrics are also common in the earliest Mycenaean levels. A coarse type of cup is another feature that spans the late M.H. and the early Mycenaean (Pl. 48, b). This later M.H. phase at Nichoria probably corresponds in time to the Classical Minyan (M.H.II) and Late Minyan (M.H.III) phases at Lefkandi.

LATE HELLADIC

The greater part of the Mycenaean sequence is represented in the deposits of trench L23 Pfg in Area IV South, which reached undisturbed bedrock. These deposits cover the whole range from L.H.I. to L.H.IIIA2, and though scrappy they are mostly clean. Large deposits assignable to L.H.IIA, with an admixture of earlier and later material, have been found in many parts of the site, notably in trench N22-XV, level 6 (from the 1969 tests) and in Area II. L.H.IIIA2/IIIB deposits are associated with House III-2. L.H.IIIB is mainly represented by one large deposit in Area II (grid K25 Ibc, level 2). L.H.IIIC is represented by a wide scatter of sherds, in surface or mixed levels.

The advent of Mycenaean pottery is marked by considerable changes in the industry. The potter's wheel comes into full use; decorated pottery is relatively common and is mass-produced, and a paint-coated ware is introduced; fabrics become generally finer, and the common open shapes smaller. The goblet is introduced at this time or slightly before; it was to become the most popular shape in both plain and coated wares and developed without interruption into the L.H.III kylix.

The earliest Mycenaean pottery from Nichoria is canonical L.H.I, consisting largely of Vapheio cups and small closed vases (Pl. 48, d). The Vapheio cups of this period frequently have heavy midribs and bevelled bases and are consistently unslipped inside. The most popular motifs are ripple-decoration and spirals linked by dot-flanked tangents, but there is a wide range of others. All of these features may be paralleled in the Argolid. The earliest attempts at a coated ware, with a thin smeary paint, appear; and plain goblets, often having a flat disc-foot, and large plain and coarse vases are common.

In L.H.IIA the Vapheio cups continue; semiglobular cups decorated with white-dotted spirals and various small closed vases decorated with hatched loops or rows of dots are also popular, and an early form of stipple-decoration is introduced (Pl. 49, b). In trench L23 Pfg, pieces of fine "palatial" jars (Pl. 49, a) and of L.M.IB style vases, mainly cups (Pl. 49, c), were found stratified above one another with this material. Similar pieces have been found in the L.H.IIA deposits elsewhere. The other wares improve in quality; a local variety of the conical cup is common in the plain ware, but goblets are still predominant.

Higher strata in trench L23 Pfg and scattered places elsewhere indicate the existence of L.H.IIB and L.H.IIIA1 phases, marked by goblets and alabastra with characteristic decoration (including Ephyraean goblets), but decorated pottery seems to have become rarer after L.H.IIA, while the coated and plain wares increased in quantity and quality. The kylix with low curved stem and the large stemmed bowl or krater seem to have been introduced in L.H.IIIA1, to be joined in L.H.IIIA2 by the strap-handled bowl. These three shapes, in fine red-coated or plain yellow wares, are characteristic of the L.H.IIIA2 deposits. The kylix has two varieties, the one with rounded profile and long straight stem, the other with carinated profile and shorter stem. Decorated kylikes and kraters have been found, with typical motifs such as the flower and whorlshell (Pl. 50, a); one unusual example has a row of helmets (Pl. 50, c). Some of these vases may be L.H.IIIB1, a phase that is not clearly distinguishable otherwise. Some pieces of Type A deep bowls found in predominantly L.H.IIIA deposits may also be attributable to L.H.IIIB1.

The local L.H.IIIB, as represented by the large deposit in Area II, is almost certainly equivalent to Argive L.H. IIIB2 and has some connections with the deposits of the palace at Pylos. It is characterized by completely coated deep bowls (Pl. 50, f) and plain carinated kylikes (Pl. 50, d), but it also contains decorated deep bowls (some

of Type A and some closer to Type B; Pl. 50, b) and kraters, plain strap-handled bowls, and identifiable fragments of a variety of other shapes, including a pyxis, alabastra (Pl. 50, e), jugs, jars, stirrup-jars, and a probable rhyton. Decorated pottery is rare and not very helpful; one jug-shoulder is decorated with diagonal whorlshells, apparently a stylistic survival.

L.H.IIIC is not definable yet as a phase. Attributable pieces include ribbed and swollen kylix stems, deep bowl fragments decorated with a wavy band or having a reserved band inside the rim, and fragments decorated with triangles or semicircles, sometimes fringed.

THE DARK AGE

Material generally attributable to the Dark Age is spread fairly widely over the site, but the best and most significant deposits located so far are in Area IV. Study of these is in a preliminary stage, and identification of different phases is not easy, since the material is scrappy and has often lost its surface. The characteristic shape is the skyphos, most often coated (at least on the upper body), but sometimes having reserved or decorated bands between the handles. Early examples are generally large, either heavy with a profile like the L.H.IIIB deep bowl or thinner with an everted rim and S-shaped profile (Pl. 50, i). These seem likely to be Proto-geometric, and fragments with raised or conical feet have been found. A class of miniature examples (Pl. 50, h) may have been introduced before the end of the Proto-geometric period. In later phases the ware becomes very thin and fine. Shapes include both skyphoi and flat-based cups (Pl. 50, g), and a metallic blue-black paint seems to have largely replaced earlier red-brown and gray-black shades. This stage is synchronous with Geometric in East Greece. Other shapes found particularly at this stage are trefoil-lipped oinochoai (Pl. 50, j), jugs with a cutaway neck, and amphorae; these are often largely coated and may have horizontal grooves below the neck. Decoration is relatively rare, but examples have been found with compass-drawn circles and semicircles, crosshatched triangles, wavy lines, and multiple zigzags and bars. The deposits range from early in Proto-geometric (the skyphoi resemble examples tentatively identified as L.H.IIIC) through the Proto-geometric lag (as late as *ca.* 750 B.C. in south Greece). Nothing has been found that is demonstrably as late as the late Geometric vases of the pithos burial discovered in 1969.

SMALL FINDS

Supervision of this department in both 1970 and 1971 was entrusted to Corliss Bodley Weeks. A total of 812 small finds have been catalogued in the first three seasons. They represent, in general, the normal range of whole and fragmentary artifacts that might be expected from a prehistoric habitation site. The largest category is worked stone, with 266 items or roughly one-third of all catalogued objects.

This category includes: tools and weapons, buttons or whorls, and carved stone beads and sealstones. Terracotta objects form the next largest category, accounting for about 27 percent of all finds. They include both figurines and spindle whorls, there being 112 terracotta whorls recorded. Identifiable objects and scraps of bronze make up almost 14 percent of the total finds, with 112 items.

In the general category of stone objects, the most common are small stone tools of both chert (mostly the red jasper variety) and obsidian. The chert pieces are mainly double- and single-edged cutting tools, with two arrowheads (Pl. 52, g). Obsidian pieces number 56, of which 35 are thin, two-edged blade fragments, triangular in section, and three are arrowheads. These artifacts, to judge by pottery associated with them, range in date from M.H. to L.H.IIIB. Apparently at Nichoria, as Valmin says was true at Malthi, stone tools were still widely used by the L.H. people. Other stone implements include pounders and grinders, quern stones, and three pestles. The majority date to L.H. but some are associated with Protogeometric pottery. One circular piece of gray limestone (Diam. 0.021 m.) is very similar to several found at Malthi which Valmin thought had been used as lids for jars or pots.¹⁵

Not all stone objects found were of a purely utilitarian nature. N41, found in 1969 in Trench K25-III and associated with L.H.IIIA pottery, is a six-sided green steatite ornament, pierced lengthwise through the center (Pl. 52, f). It is decorated with incised designs on the four broad sides. The pattern consists of two rectangles, one inside the other, and two series of concentric circles within the smaller rectangle. The concentric circles may be compared to Furumark's motif 41:14-16, usually found on stirrup jars and dated to L.H.IIIA-B. In pottery they were replaced by spirals in L.H.IIIB. This object was obviously meant to be strung like a bead but its exact use is not yet established.

Three steatite sealstones were discovered in 1971, all in Area III, in close proximity to one another. The most important is N732 (Pl. 52, d). The design shows an animal (deer or possibly bull) with elongated stylized body, facing left. Its neck is arched backward; the head is represented by a triangle, and an unattached object may represent a horn. At the left edge of the seal is a row of eight wedges, a stylized representation of foliage. The seal was found in a L.H.III level. A close parallel to ours was found at Prosymna.¹⁶ It has the same left-facing animal with arched neck and head stretched backward over the body, and the foliage motif on the left edge. However, the animal is less stylized, with head and horns complete. Another sealstone, N748, dated to L.H.IIIA2, has a simpler geometric design (Pl. 52, c). The surface is worn and the pattern is partially obliterated. The design is symmetrical, consisting of a series of four incised dots distributed around a smaller central one. A semicircle is drawn around the outside of the two side dots. Five grooves are incised

¹⁵ Cf. N. Valmin, *The Swedish Messenia Expedition*, Lund, 1938, pl. XXVII.

¹⁶ Cf. C. W. Blegen, *Prosymna*, II, Cambridge, Mass., 1937, fig. 586.

between each outside dot at the edge of the stone. The third sealstone, N704, also dating to L.H.III, is very worn. The design that can be discerned is quite simple: two opposing dots, one in the upper left corner and the other in the lower right, with a curving "tail" attached to each dot.

The current inventory of terracotta figurines is 56. All are more or less fragmentary, as might be expected on a habitation site. The total is about equally divided between female human figurines (30) and animal figurines (26). We assume that practically all had once been painted, but applied paint fares so badly in the soil at Nichoria that in most cases either the decoration has completely disappeared or only small traces are left.

Two unusual figurines were discovered in 1969. The first, N64, is the rear part of an animal torso with hind legs missing. Attached to the front edge of the torso are molded human legs, bent backward at the knees in jockey position. This is almost certainly a representation of a rider on a horse. The figurine is of creamy clay with traces of red paint in regular wavy lines across the rump and parallel lines across the legs of the rider. It is tentatively dated to L.H.IIIA2 by the associated pottery. Horses used for riding are very rare in Mycenaean art. M. S. F. Hood describes one example from Mycenae;¹⁷ and Doro Levi publishes another, supposedly from a tomb at Spata in Attica.¹⁸ Neither of these terracotta figurines, however, closely parallels the Nichoria example. The Mycenae horseman sits toward the rear of the horse's back, is stiffly upright, and his legs are not shown. The horseman from Attica sits upright in the middle of the horse's back and his legs are shown as if pushed forward. The position of our rider's legs is more suggestive of action, with the body thrown forward over the horse's neck.

The second figurine, N80, has no close parallels known to us (Pl. 52, a). It represents a badly damaged group of two persons who are apparently embracing or wrestling. The more complete figure is missing head, legs, and part of his arms. He is obviously male, the genitalia being prominent, and he seems to enfold the other. The sex of the second figure cannot be determined but this individual seems to be portrayed as larger than the first. This group apparently should be dated in L.H.III. There is no paint preserved. One could see in it a mother goddess with young male consort, or a human mother and son.

One of E. French's "Proto-Phi" terracotta female figurines is N679 (Pl. 52, b). The neck, shoulders and torso are preserved. The breasts are molded separately and painted decoration is in thin, irregular, wavy vertical lines on front and back. The shoulders are down-curved and the arms, although broken off close to the shoulders,

¹⁷ "A Mycenaean Cavalryman," *B.S.A.*, XLVIII, 1953, pp. 84-93. Cf. also E. French, "The Development of Mycenaean Terracotta Figurines," *B.S.A.*, LXVI, 1972, pp. 164, 165.

¹⁸ "La Dea Micenea a Cavallo," *Studies Presented to David M. Robinson*, I, St. Louis, 1951, pp. 108-111.

seem to have been free of the body. This figurine was found associated with L.H. pottery. One nearly complete "Phi" figurine (N100) dated L.H.IIIA2/B has no discernible painted decoration. Another of the "Psi" type (N424) is missing head and arms. Most other female figurines are so fragmentary as to make typological identification very difficult. The animal figurines are all in the typical Mycenaean mode of elongated proportions and stumpy legs.

Bronze objects are scattered throughout both Late Helladic and Dark Age levels. Two bronze arrowheads were found. One, N505, is well preserved and very carefully made. It dates to L.H.IIA and has four holes, two near the tip and two on either side of the V-slot, no doubt for attachment to its shaft (Pl. 51, a). At Prosymna similar arrowheads were found. The other bronze arrowhead (N2) is in fragmentary condition but similar to the first, though without the four holes. It tentatively dates to L.H.II-III A.

Two other Mycenaean bronze projectile points are probably javelin heads. Both have square shafts which flare to diamond-shaped heads, then taper to a sharp point. The one illustrated retains more of its shaft which tapers towards a flat end (Pl. 51, b). Both points are very nearly the same dimensions. A closely similar piece was found by Blegen who suggests that the wooden shaft of the lance was split to accommodate the longish bronze shaft.¹⁹ Both of the Nichoria javelin heads date to L.H.III, as does the one from Prosymna. One-half of a bronze tweezers (N298) was discovered, dating to L.H.IIIB. It consists of one whole prong of the tweezers (L. 0.0795 m.) with wide, flat, slightly turned up end.

Among the bronzes found in post-Mycenaean contexts, N464 is a bronze pin fragment (Pl. 51, d). One end is finished, ending in a round head. The surface is ribbed, with a series of oval and round sections. It was found in the pit deposit in House III-1. A complete bronze pin (Pl. 51, g) measures 0.102 m. in length. The head is flattened and curled. As the shaft straightens, it becomes round and tapers to a sharp point. A very well preserved fragment of a small, thick-walled bronze vessel, N639, also belongs in a Dark Age context. A small part of the rim is preserved and the estimated diameter of the rim is 0.026 m. The body curves out rather sharply at the shoulder and tapers to a ridge, possibly the beginnings of a base. The preserved profile suggests an aryballos (Pl. 51, h).

A total of 33 shell beads or fragments have been uncovered so far. These shells have been identified as genus *Dentalium* or some closely allied scaphopod (phylum-Molluska, class-Scaphopoda). Each shell has six fluted sides of equal width with a faint rib running lengthwise along the center of each side and slight cross-ribbing (Pl. 51, c). The shells taper in width. They have been bored lengthwise for stringing, presumably as beads. Some have been found with traces of red paint and all may have been painted at one time. One possible parallel is from Room 27 of the palace at

¹⁹ Blegen, *op. cit.*, fig. 361.

Pylos.²⁰ This bead seems to be burned and is identified as white paste. These shell beads may be local to Messenia. They are found in contexts from L.H.I to L.H.IIIA, with most in L.H.II.

N715 is a piece of carved ivory that still retains the shape of the curved tusk (Pl. 51, e). The surface is badly earth-stained but the fabric is remarkably solid. Its context is L.H.IIB-III A1.

Many small pieces of wall plaster have been uncovered. Some have traces of a solid wash of red or blue-gray or white paint applied in the fresco technique.

One intriguing find, N701, is an incised schist plaque of trapezoidal shape (Pl. 52, e). The incised side is flat and the reverse is rounded. Drawn on the flat surface is what appears to be a rough rectangle with a central vertical division, plus a diagonal line to the left forming a long inverted V. In the rectangular space there are eight fairly evenly spaced horizontal lines (very faintly drawn). The context is Dark Age. Is it utterly fanciful to see here the representation of a tent-like structure with steeply pitched roof? The deeply incised lines would then indicate the frame of poles and the fainter ones a subsidiary fabric of withes or reeds.

SMALL FINDS IN APSIDAL BUILDING (Area IV North)

1. Iron knife (N527). L. 0.077 m.; W. 0.024 m. (max.). Triangular iron knife blade with one cutting edge.
2. Gold wire (N566) (Pl. 51, f). L. 0.074 m.; Diam. 0.001 m. Length of gold wire bent around itself, perhaps part of a loop-in-loop chain from pendant.²¹
3. Bronze ring (N594). Diam. 0.016 m.; Width of band 0.005 m. Plain banded finger ring, no decoration.
4. Bronze double ring (?) (N618). Diam. 0.015 m. (max.); Width of band 0.002 m. Bronze double coil, broken at both ends; perhaps a double ring.
5. Two fragments of an iron pin (N667). (a) L. 0.012 m.; Diam. 0.002 m. (b) L. 0.016 m.; Diam. 0.0025 m. The two fragments do not join.
6. Bronze earring (N681). H. 0.014 m.; W. 0.01 m. (max.). Pendant earring made of two balls of bronze separated by small collar or neck.
7. Fragment of iron blade (N749). L. 0.021 m.; W. 0.011 m. Fragment of oxidized iron blade with straight sides and one cutting edge.
8. Terracotta animal head (N792). H. 0.05 m.; L. 0.041 m. (from neck to nose); W. 0.019 m. (of neck). Head and long neck of animal figure, pinkish clay. Short pointed ears; long blunt nose. Perhaps the head of a horse.

WHORLS AND LOOMWEIGHTS

Jill Carrington Smith, a student at the British School of Archaeology in Athens, made a preliminary survey of the artifacts that seem to have been used in spinning

²⁰ C. W. Blegen and Marion Rawson, *The Palace of Nestor at Pylos*, Princeton, 1966, Vol. I, Part II, fig. 283.12.

²¹ Cf. R. A. Higgins, *Greek and Roman Jewellery*, London, 1961, pp. 14, 15.

and weaving. Her rather detailed comparative study will be published elsewhere, but a brief resumé is in order here. The spindle whorls fall naturally into two basic classes, biconical and conical. The former are the more numerous. The overall impression is that the same types were in use from the beginning of the Middle Helladic period until at least the end of the Mycenaean period and probably later. This need not cause undue surprise, since fashions in tools are far more stable than in pottery. While whorls similar to the Nichoria ones were used in excavated sites throughout the Peloponnese and at least as far afield as central Greece, the closest parallels to the Nichoria whorls come from near-by localities like Malthi, Peristeria, Volimidhia, and Pylos. The rather comparable steatite objects from Mycenaean levels that are usually identified as whorls—or more recently as buttons—are more likely to have been beads.

In contrast to the above finds, the Nichoria loomweights are very unusual. In fact, with the exception of the near-by palace site at Englianos, no parallels are published from any other site in Greece. They may be broadly described as a flattish rectangle with a hole near the upper edge which is grooved or flattened. All but one example come from levels datable to L.H.IIIA1-III A2. They are made of local orange fabric, rather carefully formed and well fired.

PARA-ARCHAEOLOGICAL ACTIVITIES

INTRODUCTION

Building on a decade of successful collaboration between archaeologists and a wide spectrum of associated specialists in the regional exploration of Messenia, the Nichoria excavation was planned to take full advantage of similar opportunities. We have described above (pp. 222-224) activities involving geology, geophysics, surveying, and photogrammetry. In addition to the projects to be outlined below, we should mention the assistance of several specialists whose work will not, for various reasons, be reported here. Professor Nicholas Yassoglou had carried out an extensive program of soil sampling on and around the Nichoria hilltop before 1969, and he has continued to check his results against the evidence of the excavated areas.²² Dr. Aris Poulianos worked with us for part of the 1971 season and made considerable progress in restoring the skeletal material from the pithos grave as well as in the study and preservation of skeletal material from Area I. Professor Strathmore R. B. Cooke was a member of the staff in 1970 and has continued to supervise laboratory tests on various metallurgical and lithological samples returned to the University of Minnesota for detailed study.

Professor George Rapp, Jr., the associate director of MME, is in general charge of the para-archaeological projects and has personally carried out much of the geo-

²² Cf. Chapter 10 of the forthcoming book cited in note 1.

logical and lithological research, on-site and in the laboratory. It is in the nature of most of the projects outlined below that they must be fitted into the schedules of busy researchers and that definitive results are slow in being announced. But it is a matter of crucial significance that scholars in these fields are becoming increasingly interested in archaeologically-related scientific research.

LITHOLOGY, BOTANY, MINERALOGY

Senior staff members with backgrounds in mineralogy, metallurgy, and botany have combined to provide on-site identification of materials uncovered by excavation. Each season approximately 300 such identifications are made on items recovered and logged in the same manner as artifacts. The main categories of lithological materials are: charcoal, rock fragments (including iron and manganese oxide lumps), oxidized bronze lumps, mudbrick, stained soil, metallurgical slag, lime plaster, earth with seeds or seed impressions, pumice, and sea shells.

Black or blackish horizons, coatings, and soil patches are common. Concentrations of charcoal, humus, and manganese oxide all contribute to their formation. Oxidation potential (Eh) and soil acidity (pH) conditions have resulted in an unusually large amount of movement and concentration of black manganese oxide in the subsurface layers. Activities of man have contributed substantially to the Eh-pH fluctuation in the soil and to the resulting concentration of manganese, although precise relationships have not been worked out.

One Carbon 14 age determination was made on a sample excavated during 1970. This sample was run to confirm the age of the latest complex of foundations in Area II. The uncorrected isotopic date is A.D. 930 \pm 95 years. A bristlecone pine calibration correction would give A.D. 985. A reassuring confirmation of the Byzantine date of these buildings was the discovery of a bronze coin from the same level and dating from the late 10th or early 11th century. Four further C14 dates were obtained from charcoal samples excavated in 1971. In three cases the uncalibrated dates (\pm 90 years) correlate quite closely with the associated ceramic evidence. The sample from a level in Area IV South of developed Dark Age aspect yielded 845 B.C.; the sample from a deposit over the street in Area III with mixed Dark Age and L.H.IIB pottery yielded 1040 B.C.; and the sample from a L.H.IIIA2 level in Area III yielded 1280 B.C. The fourth sample from Area IV North had apparently been contaminated by younger material, since the result was 265 B.C., a time range when there is absolutely no evidence that any part of the ridge was inhabited. We have experimented with applying the bristlecone pine calibration correction²³ to these examples and the

²³ H. E. Suess, "Bristlecone Pine Calibration of the Radiocarbon Time Scale, 5200 B.C. to the Present," in I. U. Olsson (ed.), *Radiocarbon Variations and Absolute Chronology*, Wiley, N. Y., 1970; C. Renfrew, "Carbon 14 and the Prehistory of Europe," *Scientific American*, October, 1971, pp. 63-72.

results are, of course, disturbingly higher dates (in the neighborhood of two centuries). Until the ambiguities in the apparent fluctuations in the production of C14 in the atmosphere are better understood, we see no good purpose in publishing or attempting to explain such major inconsistencies.

Definitive results of tests on several samples of volcanic pumice recovered along with stratified L.H.I-IIB pottery will be reported in detail later. But it seems clear that our material can be correlated by refractive index methods with pumice from the great explosion of the Santorini volcano in the 15th century B.C. This is the first authenticated evidence from the mainland and its exact significance needs further study. Presumably, Santorini pumice could have been water-borne to this distance within a short time after the eruption and picked up on the shore of the gulf as a curiosity or to serve some useful purpose. It may be significant that most of our samples were found in grid L23 Pfg on what seems to have been a street leading into Area IV from the direction of the sea. At any rate, the new evidence provides a confirmatory *terminus ante quem* for the Santorini disaster.

Lumps of indurated earth have been recovered that appear to have been used as "mudbrick" in building walls or partitions. Lithological study shows that these objects belong in two separate categories. The first category is "true" mudbrick, that is, earth containing some clay sizes. With the addition of water, this material could have been shaped or even "cast" with an organic (botanical) binder. Indeed, most of these samples exhibit abundant impressions of a straw-like form. The second category contains those earth materials that, although well indurated and quite possibly used as brick in lieu of mudbrick, are most likely chunks of bedrock material quarried and trimmed for use. These samples contain little or no clay fraction. Studies are under way on modern and ancient mudbrick from the Nichoria environs to determine more accurately the lithological nature of the earth materials used.

In order to recover archaeological materials smaller in size than are ordinarily recognized and separated by hand during digging, a number of concentration methods have been tried on a pilot basis. Systematic processing of key horizons by a small gravity concentration mill designed by S. R. B. Cooke will begin in 1972. Such processing is designed to recover four separate fractions: (1) spores, pollens, seeds, charcoal, etc.; (2) small-animal bones; (3) teeth; and (4) metal and oxidized metal fragments. A laboratory froth-concentration method of collecting light material from earth that was previously sifted and water-sieved in Greece encourages us to believe that significant evidence can be recovered, especially in the category 1 (above). Charred olive pits and acorns have been identified on-site by Jennifer Shay, and she is supervising the laboratory identification of charred woods.

Concomitant with the routine on-site lithological analyses are the associated studies necessary to provide reference information. Several of these are already under way. They include: (1) the systematic collection and classification of the present flora

of the area; (2) chemical analyses of clays accessible from the site that are likely to have been used by prehistoric potters; (3) analyses of materials from potential source areas of the pumice, chert, obsidian, etc.; and (4) trace element analyses of copper and tin minerals, smelts from these minerals, slags, and copper and bronze artifacts from throughout the Mediterranean. The latter study is expected to provide "fingerprint" (provenience) data on metal source areas. The copper and bronze lumps recovered at Nichoria are being analyzed along with the "reference" material to ascertain the source of these metals which are not native to Greece.²⁴

ANIMAL BONES

In the 1969 campaign animal bones were carefully labeled and stored, but they did not receive expert study. In 1970 Ingeborg Westfall began the systematic task of cleaning and identifying the material. The main burden in this area has fallen to Donald Wolberg who joined the staff in 1971.

Faunal remains from Nichoria are both abundant and interesting and it is already possible to make certain tentative remarks concerning them. Further investigation will of course amplify or modify these interpretations. Three categories of faunal remains are distinguished as follows:

1. Domestic forms including sheep/goat, pig, cattle, dog, donkey and horse
2. Wild forms including boar, deer, hare, hedgehog, wolf, wild cattle?, shark, shellfish, snails?
3. Intrusive forms including snails and most of the mammalian microfauna

A more precise delineation of the faunal elements found in the first three seasons may be gleaned from the following inventory:

Molluska:

Class Scaphopoda
Dentalium sp.

Class Gastropoda
Helix sp.
Rumina sp.
Murex sp.
Cerithium sp.

Class Pelecypoda
Spondylus sp.
Cardium sp.
Dolium sp.
Mactra sp.
Venus sp.
Mytilus sp.

Other: fragment of coral

²⁴ Cf. Chapter 14 of the forthcoming book in note 1 for a fuller account of the background and scope of this project.

Reptilia: bony fragments of a turtle

Aves: limb fragments of a bird, probably goose

Mammalia:

Sus domesticus

Sus scropha

Canis lupes

Bos domesticus

Bos taurus

Ovis aries

Capra hircus

Equus asinus

Equus caballus

deer fragments

hare

hedgehog

Other:

at least two shark teeth

distal portion of the femur of a fossilized elephant

The faunal elements as presently known may reasonably be expected to delimit broadly the variability to be expected, although more comprehensive studies will gradually provide a fuller picture of the situation. The mammalian microfauna is clearly under-represented and in the coming season a concerted effort will be made to recover microfaunal material through the systematic use of gravity separation equipment. More information is needed in regard to the wild fauna in terms of a fuller representation of the forms that were hunted as well as the paleoecological interpretations that may be gleaned from such an analysis.

At present it appears that, among the domesticates, sheep/goat are about three times as abundant as pig, and pig is about twice as abundant as cattle. It will be most interesting to determine the relative frequencies of these forms from horizon to horizon. Within any particular horizon, it may eventually be possible to determine which householders were eating what kinds of meat. Horse teeth are known from L.H.III levels; we have at least two teeth, one of which appears to have been burnt. It will be interesting to see if horse remains appear from lower levels.

Wild forms are clearly more significant in lower levels; and the dominant wild animal taken was boar, followed by deer. It is significant that remains from lower levels represent more robust animals and that, among the domesticates, older individuals were slaughtered. It also appears that the teeth of animals from the older levels evidence greater wear than those from higher levels. If more lush pasture with higher silica concentrations was then available, greater tooth-wear might well be expected in grazing animals. Similarly, the numbers of wild boar represented would seem to require a far more extensive woodland environment than is the case at present.

Certain questions persist and must await further investigation. If shellfish were

regularly employed as a food resource of some significance, one wonders why their shelly remains are not better represented. Some charred remains of oyster shells occur but their number is insignificant. It is possible that shellfish were either eaten or processed near the shore and any midden deposits may have to be sought there. It is obvious, of course, that the shorelines may well have altered through time. Similarly, if fishing was important, one must ask what has happened to the fish remains. Two shark teeth are known, but their significance is uncertain. They might have been brought up on the site from elsewhere, encased in clay deposits. Perhaps fishing was a seasonal activity carried on from temporary dwelling sites near the seashore.

Another question of interest centers on whether the dog was utilized as a food source. Further study should provide an answer. Several specimens consist of charred and fragmented jaws and limbs. However, no cut marks have been observed on any of the specimens to date, and they could have been purely sacrificial animals.

Much information has been provided by the bone material regarding butchering techniques. It is apparent that strong parallels exist between the Nichoria material and that found at Lerna;²⁵ it is possible to match almost every fragment found at Lerna with one from Nichoria. Long bones were pounded while still "green" and twisted in order to extract the marrow. The pounding operation was probably carried out with the aid of stones of convenient size. After the initial pounding and twisting, the long bones were further split lengthwise parallel to the long axis to complete the task. Mandibular condyles and rami were knocked off (why remains an intriguing question). Material from the deepest trenches seems to indicate a different and less intense mode of butchering in which skulls and limbs appear to be indifferently hacked. Further study and closer correlations should provide a fuller picture and more definite conclusions. Pig ulnae have been found which bear cut or butchering marks. Several bone objects have been found and catalogued in small finds. The extent to which bone was employed for the fabrication of implements, ornaments, and weapons requires further study.

Of some interest is the discovery of the distal portion of an elephant femur found in an archaeological context. The animal represented is a fossilized, extinct, probably Pliocene form that once occurred in the area. Clearly, a prehistoric inhabitant of Nichoria went to some effort to collect and carry home the fossil fragment, perhaps struck by its massiveness or its mode of occurrence.

SUMMARY

In a preliminary report such as the above, there can be no question of drawing definitive conclusions. And generalizations suggested in this brief resumé may of course be invalidated by closer study of the evidence already available or by future

²⁵ N. Gejvall, *Lerna, I, The Fauna*, Princeton, 1969.

discoveries. At the same time, we have inevitably formed certain impressions that may be worth recording at this time.

Let us first glance back over the history of the Nichoria habitation site. It would appear that this was the most important settlement in the area bordering the northwest corner of the Messenian Gulf from about 2000 until at least 700 B.C. Its earlier history seems to have been closely parallel to that of Epano Englianos on the opposite side of the peninsula. That is, at both sites there is slight evidence of an Early Helladic settlement on or near the hill, and a Middle Helladic village of larger than average size had developed by early Mycenaean times into the capital of a prosperous local kingdom. Thereafter, however, their stories diverged. Epano Englianos became the royal citadel controlling the whole region, while Nichoria was a tributary town. Excavation has so far yielded no evidence to support or refute the theory that Nichoria may have been the capital of the "Further Province." It almost certainly did not reach any floruit comparable to that of Englianos in L.H.IIIB as compared with L.H.IIIA or earlier Mycenaean periods. Nor is there any dependable evidence that Nichoria suffered by fire, as did the Englianos citadel, in the late 13th century B.C.

Nichoria certainly experienced a drastic reduction in prosperity and population in the following centuries, but it was not permanently abandoned like Englianos. Indeed, present evidence, though far from conclusive, suggests that occupation was continuous or only briefly interrupted in the transition period. Further, while the Englianos hill was apparently being cultivated by only a few farmers, the settlement on the Nichoria ridge was revitalized in Geometric times. Thereafter both acropolises were deserted, except for a brief and sparse medieval occupation at Nichoria. Though the environs of neither site have been thoroughly checked, present indications are that the Nichoria area retained a fair-sized local population in Archaic times and later, whereas the Englianos area was deserted in favor of settlements on or nearer the coast.

We have already described the strategic location of our site in terms of communications by land and water, access to good agricultural land, defense, and similar considerations. Detailed study of the local road network will require further excavation on the hill as well as reconnaissance in the environs, but already we can understand it better than before 1969.

The main east-west highway passed under Nichoria's northern cliffs (Fig. 1), and there is now some reason to believe that the junction in prehistoric times between that route and the road along the west of the gulf was precisely at the northwest end of the Nichoria ridge. The dromos of the tholos in Area I faces straight down to the sea through the Vathirema ravine which skirts the southwest edge of the hill. And the high artificial mound in which Greek excavations uncovered the ruins of five tholoi looms slightly to the north in the same line. Whether the town's harbor was

4 km. down the coast at the modern village of Petalidhi or whether it was in the lagoon (now completely filled) at the mouth of the Karia River, direct access from the sea to the royal citadel was almost surely via this ravine. So the wayfarer, coming from any direction, would pass through the main cemetery area, and the major burials occupy a fairly canonical position just to west of the associated settlement.

It is reasonably sure that the main approach to the Nichoria ridgetop in Mycenaean times was from this road junction in the midst of the cemetery. We can imagine the traveler who wished to visit the town following an easy ascending road-line (still visible) that made an S-curve and then led past the back of the tholos and the Little Circle in Area I. At this point there would have been a gate if the site was fortified. This is still a moot point. The rubble foundation about 1 m. wide that curves around the base of the steep slope above the Little Circle could represent the base of a fortification wall or just a heavy terrace wall of no great height. Apart from this, the only point on the periphery of the whole ridge where foundations of possible fortifications have so far been detected is on a spur just east of the south end of Area IV (Fig. 2). Here the owner recently exposed a long line of very large rough limestone blocks which almost certainly represent a prehistoric construction and could scarcely belong to a single building. It is noteworthy that at both of these spots the topography allows relatively easy access, whereas throughout most of its periphery the ridge is so high and steep that artificial fortifications may not have been considered necessary. But a more reasonable hypothesis would be that, if fortifications were utilized at all, only a limited area (or areas) of the ridge top was so protected. In that case, the northwest acropolis (Area II) would seem to be the most essential; and the spur at the southeast could have been a secondary inner fortress, commanding the road up the ravine.

To revert to the system of streets and roads, the main approach to the summit of the northwest acropolis certainly followed the present easy ascent along the north edge until one reached the small northwest gate (grid K25 Fe in Fig. 6). This gave access to the street that seems to have looped through Area II, and back down to its northeast corner. But the northwest gate seems an unlikely main entrance, and we are at present considering the possibility that the main approach continued along the north edge on a line now lost by erosion and entered approximately in grid K25 NOhi, where Areas II and III join and where one has to place the beginning of the wide street that runs diagonally southeast through Area III.

We have also uncovered one short stretch of what seems to have been a street in Area IV, trench L23 Pfg. Here a L.H.II wall supported a high terrace to the west, and the street apparently flanked its east face. This trench is very close to the present edge of the ridge, and it looks as if there may have been an approach to the ridge top here from the harbor road in the Vathirema gorge. This possibility is strengthened by the report of the oldest inhabitant of Karpofora village that when he was a

boy he watered his animals at a spring in Vathirema. We have located the water source (dry now in summer) directly below Area IV, and it is a reasonable hypothesis that the street in trench L23 Pfg led down the steep slope to the spring and a junction with the harbor road.

One more likely access route may be briefly described. In 1969 we used a path that leads up from the village of Rizomilo through a ravine that cuts into the east flank between the North Veves and Tsagdis properties (Fig. 2). It is precisely in grid L23 at the head of this approach that the earliest evidence (M.H.) for permanent occupation has been found. Since this is the easiest line of communication between the hilltop and the nearer land in the river valley, it is very likely that it was the first "road" up the ridge and that it continued to be heavily used by farmers who lived in the central area of the site.

WILLIAM A. McDONALD

UNIVERSITY OF MINNESOTA

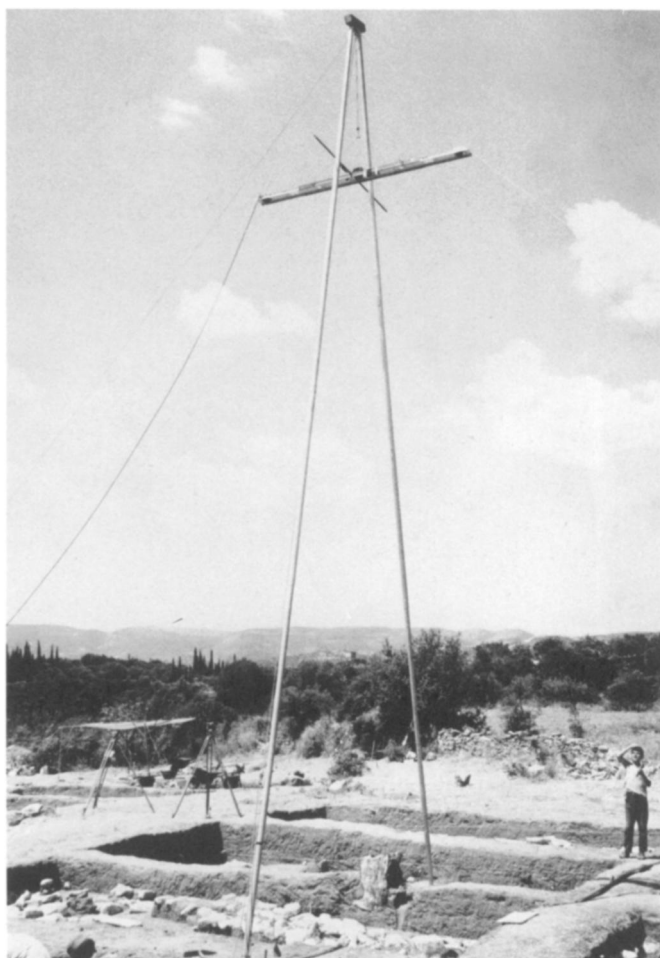


Nichoria from above (balloon photo by J. Whittlesey)

WILLIAM A. McDONALD: EXCAVATIONS AT NICHORIA IN MESSENIA, 1969-1971



a. J. Whittlesey operating hydrogen balloon



b. Bipod in action, Area IV (1971)



c. M. J. Aitken instructing N. Wilkie and M. Sturgeon
in use of magnetometer



a. Child Burials in Cists, Trench K25-II, from South



b. Trench K25-III from Southeast, showing L.H.IIIA Floor



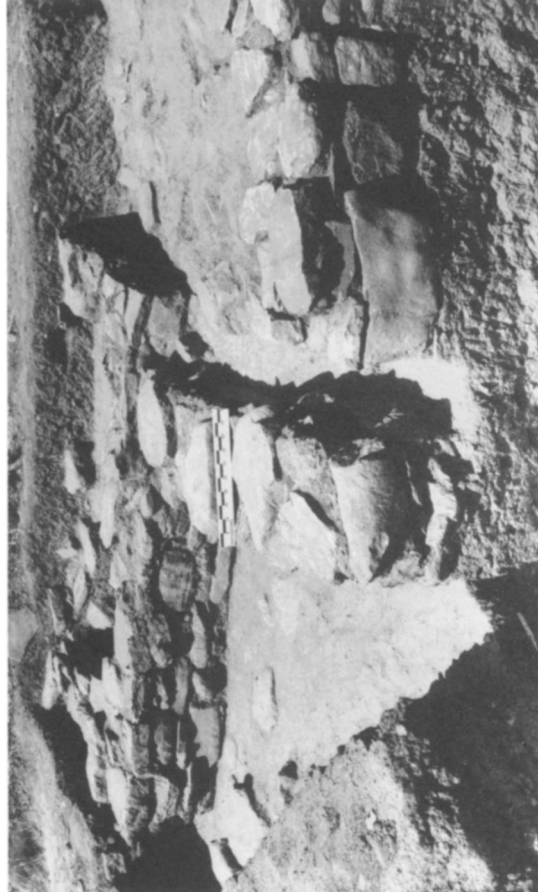
c. Burial in Geometric Pithos, Trench L24-III, from Bipod



a. Trenches and Foundations of Byzantine House in Grid N22, from balloon



b. Interior of Byzantine House from Northwest, with Stone Platform



c. Trenches N22-XIV and XV, Walls and Drain from Southeast

WILLIAM A. McDONALD: EXCAVATIONS AT NICHORIA IN MESSENA, 1969-1971



a. Area I from South (helicopter photo)



b. Stone Circle, Area I, from Bipod, with Burial at South Edge



c. Stone Circle, Area I, from Bipod with Skeletons Revealed



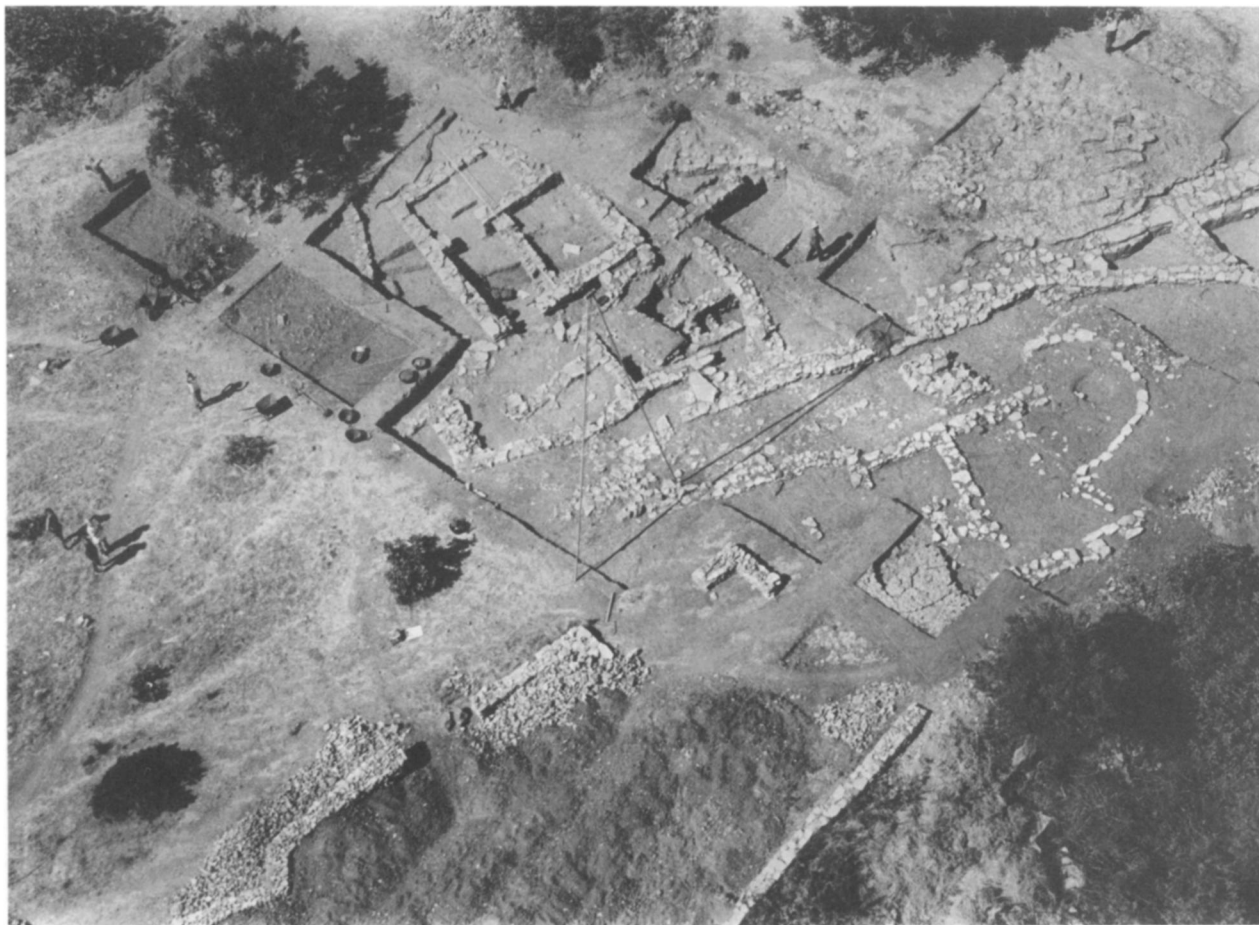
a. Area II from South (helicopter photo)



b. K25 Ic from South, showing Stone Paving below L.H.IIIB Deposit



c. K25 JKb,c, House II-1 (later removed) above Mycenaean Walls



a. Area III from Northeast (helicopter photo)



b. K25 Ne, Shaft Grave, during excavation



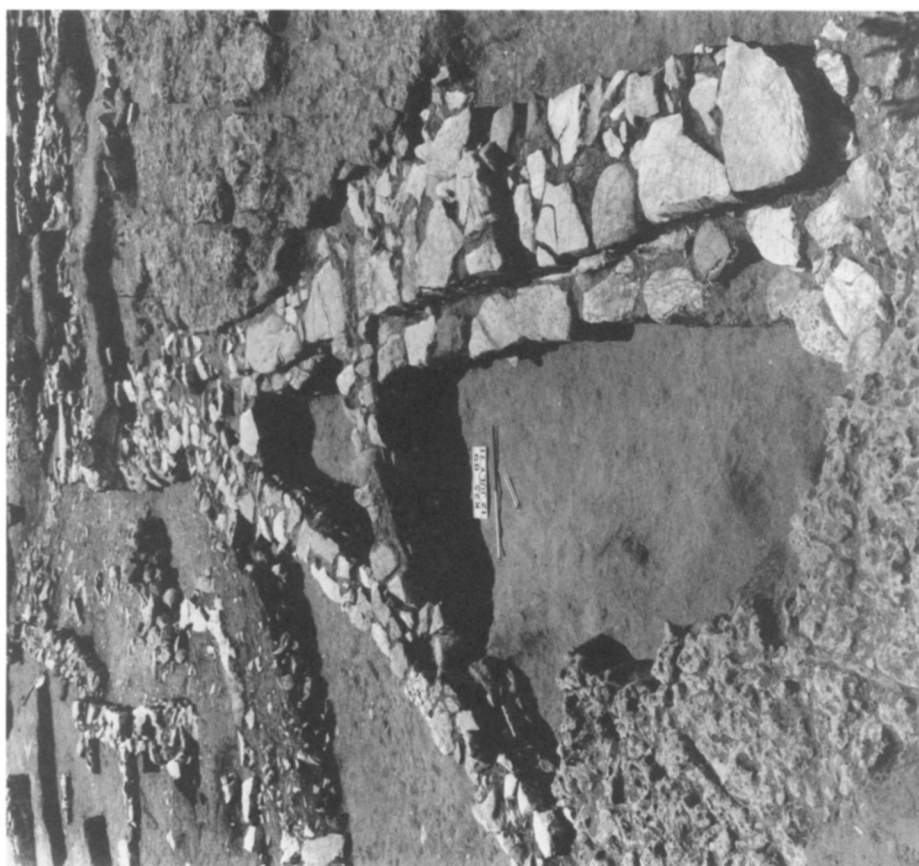
c. K25 NOef from South, showing Mycenaean Walls and Cist Grave overlying M.H. Deposit



b. Area III, Mycenaean Street, from Southeast



c. Dark Age House III-1 over Mycenaean Wall, South



a. K25 Qg, Terrace Wall from Northwest, with Later Walls overlying Original Street



a. Mycenaean House III-2 from Northeast



b. Doorway in Partition Wall of House III-2, from East



c. Area IV, L23 Pfg from North; L.H.II Terrace Wall at Right



a. Area IV North and South Sectors (helicopter photo), looking North



b. L23 Vo from West, Mycenaean Walls of Several Phases



c. Cobbled Circular Area in Large Apsidal Building, from West



c. M.H.II Matt-painted Sherds



d. L.H.I Sherds



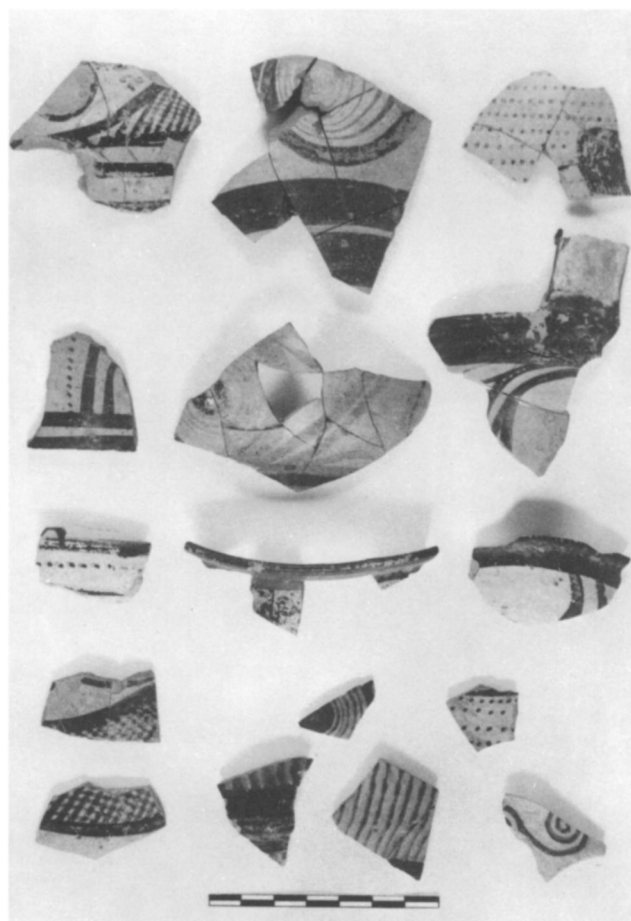
a. NP8, Early M.H. Bowl



b. NP3, Coarse M.H. Cup



a. "Palatial" L.H.IIA Sherds



b. Local L.H.IIA Sherds



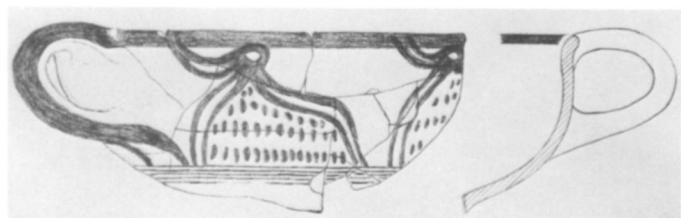
c. L.M.IB Style Sherds



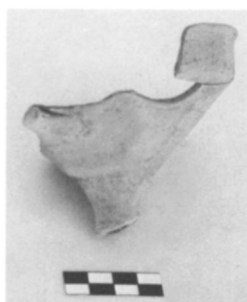
a. NP68, L.H.IIIA2-IIIB Krater



b. NP41, Decorated Deep Bowl



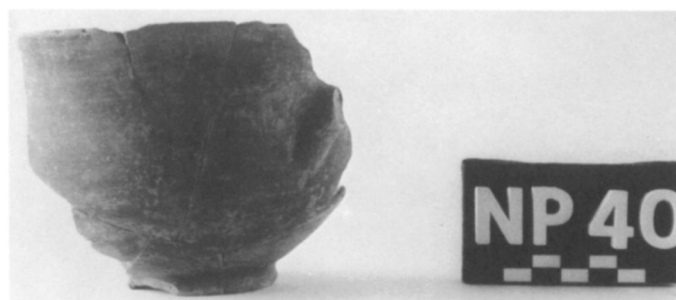
c. NP14, L.H.IIIA Kylix (restored drawing by D. Bingham)



d. NP32, Carinated Kylix



e. NP31, Alabastron



f. NP40, L.H.IIIB Deep Bowl



g. NP56, Geometric Cup



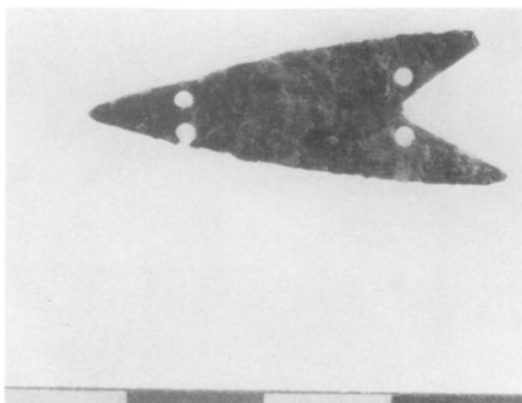
h. NP61, Small Protogeometric (?) Skyphos



i. NP46, Early Skyphos



j. NP72, Geometric Oinochoe



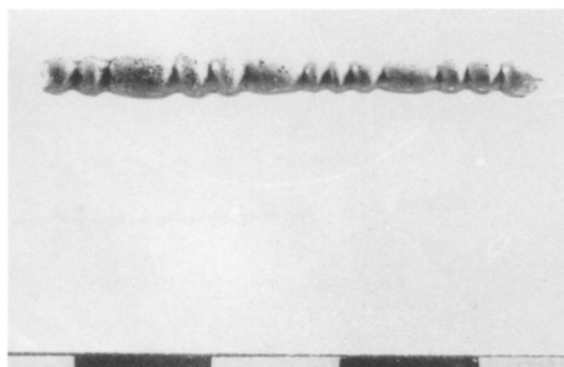
a. N505, L.H.IIA Arrow Head



b. N539, L.H.III Javelin Point



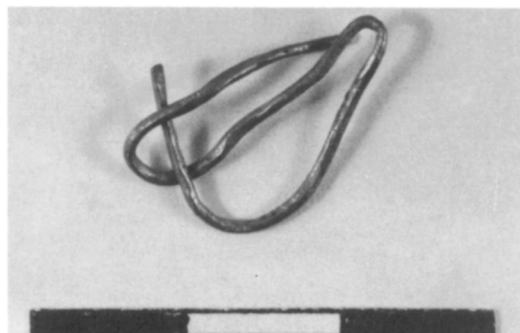
c. N611, L.H.I-IIIa Shell Beads



d. N464, Dark Age Bronze Pin from Pit in House III-1



e. N715, Carved Ivory



f. N566, Dark Age Gold Wire



g. N768, Dark Age Bronze Pin



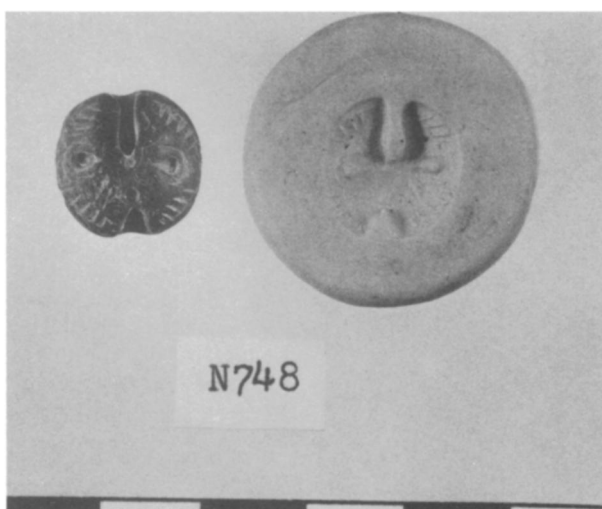
h. N639, Part of Dark Age Bronze Vessel



a. N80, L.H.III "Wrestler" Figurine



b. N679, L.H.III Female Figurine



c. N748, L.H.III Sealstone



d. N732, L.H.III Sealstone



e. N701, Dark Age Incised Stone Plaque



f. N41, Decorated Stone Ornament



g. Stone implements